Behavioral Health

Child & Adolescent Mental Health Issues

Chair: Douglas Leslie, Ph.D.

Sunday, June 3 • 11:00 a.m.-12:30 p.m.

▪ Mental Health Needs in Louisiana Schools Following Hurricane Katrina

Paula Madrid, Psy.D., Richard Garfield, R.N., Dr.P.H., Roy Grant, M.A.

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Research Objective: School based health centers (SBHCs) are a major or primary source of health care for medically underserved children and youth, serving 2 million students in 44 states. Louisiana has the nation's highest child poverty rate and the second worst child health indicators. Prior to Hurricane Katrina, Louisiana had 55 SBHCs, more than half of which served rural communities. After Katrina, 43 SBHCs were functional. Children and youth at high risk because of poverty or other vulnerabilities are especially likely to show posttraumatic stress reactions following a disaster. This study was intended to describe the impact of Hurricane Katrina on children and youth using SBHCs in Louisiana.
Study Design: Six months after the hurricane, a 17 item survey of our design was distributed to mental health professionals at each of these SBHCs. Some items were yes/no in format, some used a 3 point Likert scale. All allowed space for comments. Items addressed the number of evacuee children in the school, prevalence of behaviors consistent with mental health conditions, student needs and SBHC resources. Schools surveyed were divided into high- and low-displacement status based on percent of evacuee students in the population.
Population Studied: Respondents were mental health professionals in Louisiana's SBHCs.
Principle Findings: Response rate was 98%. There were ~37,000 students in the surveyed schools (mean, 937 per school). Approximately 4500 students (12%) were displaced by the hurricane, 75% of whom were placed in 1/3 of the schools. Six months post-Katrina, 53% of the SBHCs reported an increase in patient volume. Behaviors reported as increased included verbal arguments (76%), physical fights (64%), truancy (55%), conduct disordered behavior (43%), and sexual promiscuity (31%). Also reported were increases in distractibility, oppositionalism, sleep disturbance, somatic symptoms, family conflict and domestic violence. Anxiety was the most frequently reported symptom. Concern about student mental health status was greatest in schools with the high-displacement status. Half, 50%, of respondents reported a need for additional training in trauma assessment and intervention techniques. Mental health professionals also emphasized the inadequate availability of resources to meet increased demand, especially the pre-Katrina scarcity of community-based child and adolescent mental health resources.
Conclusions: Natural disasters are known to have a strong and lasting impact on children and youth. Displacement and evacuation add to the impact these events have on social and emotional functioning. Schools can play an important role in meeting post-disaster mental health needs; however, they require adequate training for personnel and sufficient resources to meet increased demand.
Implications for Policy, Practice or Delivery: Mental health professionals in school-based health centers should be trained in trauma assessment and intervention, since they will be first responders for children and youth following a natural disaster. Federal post-disaster mental health funding (authorized under the Stafford Act) should not be time-limited or restricted to screening without treatment, as has often been the case post-Katrina (and previously in New York City post-9/11/01). Adequate mental health service capacity is an essential feature of community disaster preparedness, especially in high-risk, high-poverty areas.

▪ Child Mental Health Disorders: Assessing the Burden on Families

Susan Busch, Ph.D., Colleen Barry, Ph.D.

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Research Objective: To assess the economic toll on families of having a child with a mental health disorder compared to having a child with other special health care needs. There are at

least four reasons to hypothesize the economic burden on families of children with mental health disorders may be greater. First, private insurance often covers mental health less generously than general health care. Second, the treatment needs of a child with a mental health condition may be less predictable making it more difficult for parents to plan financially or to take time away from work. A child's mental health diagnosis may be viewed as more subjective thereby reducing the social acceptability of time off work. Finally, stigma may play a role if parents are less likely to access appropriate services or receive in-kind support from family members and friends.
Study Design: We compare financial, labor market and time burden outcomes for families of children with mental health care needs to those of children with other special health care needs. We use propensity score matching to minimize confounding due to differences in demographics and illness severity across the two groups.
Population Studied: The 2000 SLAITS National Survey of Children with Special Health Care Needs.
Principle Findings: Among the privately insured, we find that families of children with mental health disorders are significantly more likely than families of other special needs children to spend more than $375 out-of-pocket on medical care (42 vs. 31 %), to report that their child's health has caused financial problems (29 vs 20 %) and to indicate that additional income was needed to care for their child (23 vs 16 %). Among the publicly insured, we detected no significant differences in measures of financial burden among families of special needs children with mental health conditions compared to those with medical conditions. Parents of children needing mental health care were significantly more likely to cut work hours to care for a child (36 vs 25 %) and to stop working due to a child's health than parents of children with other special health care needs (16 vs 12 %). We detected no difference in the proportion of parents spending time directly providing care on a weekly basis. However, parents of children with mental health conditions were significantly more likely to spend time arranging their child's care (16 vs 12 %).
Conclusions: We find that caring for a child with a mental health disorder affects family financial well-being more than caring for a child with other special health care needs. Parents of children with mental health problems were also more likely to cut work hours, to quit work and spent more time arranging their child's care.
Implications for Policy, Practice or Delivery: This study suggests that expanding private health coverage and preserving disability cash assistance programs for low income families can ease the economic toll of caring for a mentally ill child.
Funding Source: RWJF

- Help-Seeking & Access to Mental Health Care among University Students

Daniel Eisenberg, Ph.D., Ezra Golberstein, Sarah E. Gollust

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Research Objective: Understanding access to mental health care among university students will enhance efforts to prevent and treat mental disorders during a pivotal period in life and may yield lessons for the general population. Our research objectives were to estimate the prevalence of mental health problems, quantify mental health service use, and estimate how various factors are associated with help-seeking and access in a university student population. This is the only study in recent years, to our knowledge, to examine mental health symptoms and use of services using validated instruments and adjustments for non-response bias in a representative university student sample.
Study Design: A web-based survey was administered to a random sample of university students at a single institution. Key measures of mental health included screens for depression (PHQ-9), anxiety disorders (PHQ), suicidal ideation and behavior, disordered eating behavior (SCOFF), and self-injury. Mental health service utilization was measured as having received psychotropic medication or psychotherapy in the past year, using survey instruments from the Healthcare for Communities study. Non-response bias was accounted for using administrative data and a brief non-respondent survey.
Population Studied: The sample included 2,843 students attending a large, public university with a demographic profile similar to the national student population.
Principle Findings: The response rate was 57% for the main survey, and 55% for the brief non-response survey. The estimated prevalence of any depressive or anxiety disorder was 14%.

Suicidal ideation in the past four weeks was reported by 2% of students, and self-injury by 7%. 24% of females and 8% of males screened positive for disordered eating. Of students with positive screens for depression or anxiety, 37-84% did not receive any services, depending on the disorder. Significant predictors of not receiving services included a lack of perceived need, being unaware of services or insurance coverage, skepticism about treatment effectiveness, low socioeconomic background, and being Asian or Pacific Islander. An index measuring perceived public stigma, however, was not significantly associated with the likelihood of receiving services. The non-response survey indicated that responders to the main survey were much more likely to screen positive for mental disorders and report mental health service use.

Conclusions: Depression, anxiety disorders, self-injury, and disordered eating appear to be relatively common mental health problems among university students. Even though 95% of students had health insurance and all students had access to free short-term psychotherapy and basic health services, most students with apparent mental disorders did not receive any treatment.

Implications for Policy, Practice or Delivery: Initiatives to improve access to mental health care for students have the potential to produce substantial benefits in terms of mental health and related outcomes. Although additional research is needed to confirm causal relationships, our evidence suggests that the most promising approaches might include efforts to raise awareness about service options and treatment effectiveness and to target groups that have especially low utilization rates. This study is the starting point for the development of an annual, national study to investigate these issues.

- Foster Care Caseworkers as a Gateway to Outpatient Mental Health Services for Children

Jennifer Bellamy, M.S.W., Ph.D.

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Research Objective: Children in long term foster care have tremendous rates of mental and behavioral health problems and use mental health services a greater rate than many other high risk populations. However, not all children in foster care with a behavioral health need receive formal mental health services. Research guided by Andersen's behavioral model of service use has identified factors that influence service use. The study described in the current paper expands on this body of research by applying modified version of the Gateway Provider Model to a national sample of children in long term foster care. The hypothesis tested is that foster care caseworkers' perception of children's needs mediate foster care children's contact with the outpatient mental health system.

Study Design: This study is a secondary analysis of a nationally representative sample of children in long term foster care. Data used in the current study include the baseline and 18 month follow-up waves. Participants were sampled using a stratified two-stage, population proportionate to size procedure. Behavioral health problems were measured using the Achenbach's Child Behavior Checklist (CBCL) and use of outpatient mental health services was measured with an adapted version of the Child and Adolescent Services Assessment (CASA). Sobel-Goodman mediation tests were performed to assess the mediation pathways. Logistic regression models are used to test the full model. Multiple imputation is used to address missing data.

Population Studied: The populations studied includes 417 children from the National Survey of Child and Adolescent Well-being (NSCAW) between the ages of 2-15 years who have been in foster care for approximately one year at the time of sampling.

Principle Findings: Evidence of a partial mediation effect for caseworkers perception that the child needs services, race/ethnicity, and gender is indicated by Sobel-Goodman mediation tests. Caseworkers' perception of children's need for services is more strongly predictive of outpatient mental health service contact than children's behavioral health need in the full model. Race and gender are also statistically significant predictors of service contact.

Conclusions: Earlier research has included perceptions of children's need by adults, however this construct has been conceptualized as an intermediate outcome rather than a pathway between the behavioral health needs of the child and services. Foster caseworkers'

perception of need is related to, but does not accurately reflect behavioral health problems as assessed by standardized measures. As a result, some children who may be in need of services do not have contact with the outpatient mental health system. Other important factors included race and gender effects.
Implications for Policy, Practice or Delivery: Caseworkers may or may not use standardized assessments to make service referrals, and these decisions may be influenced by caseworkers' assessment of other factors such as history or maltreatment, race/ethnicity, and gender. This study suggests that caseworkers should be targeted through education and training efforts to assess children and facilitate outpatient service contact when indicated. Research is also needed to more clearly elucidate caseworkers' decision making related to children's contact with outpatient mental health services.
Funding Source: NIMH

- **Adolescent Behavioral Risk Screening & Use of Health Services**

Deena Chisolm, Ph.D., William Gardner, Ph.D., Kelly Kelleher, M.D., M.P.H.

Presented By: Deena Chisolm, Ph.D., Assistant Professor, Pediatrics, Ohio State University, 700 Children's Drive, Room J1401, Columbus, OH 43205, Phone: (614) 722-6030, Fax: (614) 722-3544, Email: chisolmd@ccri.net

Research Objective: Behavioral risk screening in primary care has long been advocated as a way to engage at-risk youth in care and improve outcomes. One concern about screening is that the increased service use would overwhelm an already stressed healthcare system. This study examines adolescent use of health care services before and after electronic screening for behavioral health risks including depression, suicidal ideation, substance use, and violence. We test whether the identification of risk behaviors through screening is associated with increased probability of subsequent service use.
Study Design: Based on screening using a tablet PC-based system, youth, ages 11 to 19 in nine urban primary care clinics were categorized into one of six groups: no risks, depression only, suicidal ideation only, substance use only, violence risk only, or multiple risks. We extracted healthcare utilization data for all settings from our health system's clinical information system for 6 months prior to screening and 6 months post-screening. Outcomes of interest were "any health care use" and "mental health use." Mental health use is defined as any visit with at least one mental health related diagnostic code. Using a logistic regression model to control for age, gender, and prior health service use, we estimated odds ratios (OR) for use by risk category.
Population Studied: Our population included 1524 youths. 57% were female, 28% were age 16 or over, and 75% were insured by Medicaid. The risk distribution was as follows: no risk 41%, violence risk only 24%, depression only 7%, substance use only 3%, suicidal ideation only 2%, and multiple risks 22%.
Principle Findings: In the 6 months prior to screening, at-risk youth were more likely to have "any use" (OR=1.33) and "mental health use" (OR=1.62) than those at no risk. Post-screening, we found little relationship between screening outcome and probability of "any use," after controlling for prior use. Only suicidal ideation was associated with an increased probability of "any use" (OR=2.97). There was, however, a strong association between screening outcome and subsequent "mental health use." Youth screening positive for suicidal ideation (OR=3.70), depression (OR=2.53), violence risk (OR=1.59) and multiple risks (OR=1.87) all had a higher probability of subsequent "mental health use" than no risk patients.
Conclusions: Our behavioral risk screening system identified more than half of youth as "at-risk". These youth were more likely to have used healthcare services in the past 6 months than youth with no risk. Screening positive for behavioral risk was associated with higher probability of subsequent "mental health use" but not with higher probability of "any use".
Implications for Policy, Practice or Delivery: The concern that formal identification of at-risk youth will create overwhelming demand is a significant barrier to implementing screening systems cited by many clinicians. Our results suggest that concern may be overstated. At-risk youth are higher service users even before screening occurs. Identification of risk increased the probability that behavioral/mental health issues would be addressed within visits but did not increase the overall probability of visits.
Funding Source: NIDA

Substance Use Disorders

Chair: Redonna Chandler, Ph.D.

Monday, June 4 • 2:30 p.m.-4:00 p.m.

▪ Measuring the Enhancement of Integrated Care Management for a Medicaid Population with Substance Abuse & High Medical Expenses: Return on Investment after Two Years

Peter Fagan, Ph.D., Martha Sylvia, R.N., M.S.N., M.B.A., Kenneth Stoller, M.D., Michael Griswold, Ph.D., Michelle Hawkins, R.N., M.S.N., M.B.A., CCM, Linda Dunbar, R.N., Ph.D.

Presented By: Peter Fagan, Ph.D., Director of Research, Assoc Prof, Dept of Psychiatry and Beh Sciences, Johns Hopkins HealthCare LLC, 6704 Curtis Court, Glen Burnie, MD 21060, Phone: (410) 424-4958, Fax: (410) 424-4958, Email: pfagan@jhmi.edu

Research Objective: This study examines if MCO integration of substance abuse outreach and medical care management of Medicaid recipients who abuse substances and are high utilizers of medical services can have a positive return on investment (ROI). Prelimary results were presented at the ARM 2006.
Study Design: The study is a two-group comparison of a 24 month quality enhancement initiative (QEI). The Intervention group (N = 400) was managed by substance abuse coordinators (SAC) and nurse case managers who received ongoing training in the integration of medical case management and substance abuse services. The Comparison group (N = 203) received usual and customary outreach. The study tracked the start-up costs and operational expenses for the twenty four months. It compared the utilization and total medical costs for the 24 months intervention for the two groups. The research is being independently evaluated by the University of North Carolina as part of a ten site study of the business case for quality among Medicaid recipients.
Population Studied: Adults enrolled in a Medicaid MCO with serious medical conditions and a history of substance abuse. The morbidity level of the study sample (N = 603) was selected based on an ACG predictive model score = > 0.39 and a diagnosis of substance abuse during the previous 27 months.
Principle Findings: While the first 12 months of the intervention yielded a positive ROI, extended 24 month trend analysis found that 1) the increase in total (unadjusted) medical costs in the Intervention group were $30 pmpm less than those of the Comparison group. 2) The Intervention group had increases in fee for service ($49 pmpm) and pharmacy ($42 pmpm) costs contrasted to no change in the combination of these categories for the Comparison group. 3) The combined initial start-up costs ($40,276) and 24 month QEI operational expenses ($237,318) resulted in a total expense of $277,594. If we employ the positive differential ($30) between the Intervention and Comparison groups' medical costs, we estimate a projected savings ($30 x 7444 member months) of $223,320. This results in marginal adjusted pre-post ROI of – 0.2 for the Intervention group. There was no significant difference in the increase in medical costs between the Intervention and Comparison groups. 4) The Intervention group had an increase in members receiving substance abuse treatment and enrolling in case management.
Conclusions: 1) Integrated care management, combining medical and substance abuse case management for medically compromised and potentially substance using MCO Medicaid recipients, may be able to be provided without incurring major negative expenses; 2) intensified case management may result in increases in fee for service and pharmacy costs; 3) the challenges in the integration of behavioral and medical case management are considerable and require further applied research.
Implications for Policy, Practice or Delivery: 1) Medicaid MCOs should continue to integrate behavioral and medical care management; 2) ROI calculation should be examined with both point estimates and trend analyses; 3) evaluating interventions for high risk Medicaid populations needs to measure not only medical costs but also quality of life and societal effects.
Funding Source: Center for Health Care Strategies (CHCS)

▪ Work Requirements Mental Health & Substance Use After Welfare Reform: Evidence from 3 Cities

Ellen Meara, Ph.D., Richard G. Frank, Ph.D.

Presented By: Ellen Meara, Ph.D., Assistant Professor, Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115, Phone: (617) 432-3537, Fax: (617) 432-0173, Email: meara@hcp.med.harvard.edu

Research Objective: To compare labor market outcomes for low income women with mental

health and substance use barriers to employment to other likely users of welfare after the creation of TANF (Temporary Assistance for NEedy Families).
Study Design: Using 1999-2001 data from Boston, Chicago and San Antonio, we compared the labor market and welfare experience of women with four employment barriers: poor mental health, moderate to heavy drug and alcohol use, a child with a behavior problem, and a child under the age of 3, at two points in time, 1999, and again in 2000-2001.
Population Studied: Over 1600 female caregivers (mostly mothers) of children aged 0-14, living in low and moderate income neighborhoods in Boston, Chicago, and San Antonio.
Principle Findings: Women with poor mental health and moderate to heavy substance users were much less likely to move into work than other groups. These women were disproportionately sanctioned for noncompliance with welfare requirements in the latter period, as federal work participation requirements increased.
Conclusions: In Boston, Chicago, and San Antonio, state welfare policies allowed women with poor mental health and moderate to heavy substance use to remain on welfare over time, but this protection was offset by the fact that these same women were more likely to be sanctioned towards the end of the 1999 to 2001 period.
Implications for Policy, Practice or Delivery: Until now, the federal government has been agnostic about recognizing "exceptional" circumstances in welfare reform. Our results raise questions regarding whether the program incentives can motivate the desired behaviors for important subgroups of welfare recipients. The reauthorization of TANF explicitly limits states' ability to allow women with mental health and substance use disorders to count treatment as a work activity. Our results suggest that this stricter treatment will have little impact on the behavior of these women, and may have negative financial impact on these women and their families.
Funding Source: NIDA, MacArthur Network on Mental Health Policy

- The Role of Psychiatric Comorbidity in Dropout From Substance Abuse Treatment

Brian Perron, M.S.S.W.

Presented By: Brian Perron, M.S.S.W., Doctoral candidate, Social Work, Washington University, One Brookings Drive, St. Louis, MO 63130,
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Research Objective: Epidemiological research shows wide agreement that comorbid disorders are the rule rather than the exception. Substance abuse treatment programs typically report that 50 to 75% of their clients have comorbid psychiatric disorders. Treatment for comorbid disorders can be effective; however, the benefits are often not realized because persons typically fail to stay in treatment long enough to achieve any clinical benefits. The purpose of this study was to test the influence of psychiatric comorbidities on dropout from substance abuse treatment while taking into account services needed and received.
Study Design: This study used data from the treatment experiences questionnaire of the National Treatment Improvement Evaluation Study (NTIES). Treatment dropout was defined using an observation period of 90 days, which is the minimum amount of treatment necessary to achieve any clinical benefits. Psychiatric comorbidities included hallucinations, depression, severe anxiety, and suicidality. The primary analytic strategy was Cox regression (survival analysis).
Population Studied: This study sample for this study focused on persons receiving outpatient substance abuse treatment from publicly funded treatment programs (N=1,439). It includes a substantially higher proportion of African Americans and Hispanics that is generally observed in the substance abuse treatment services research.
Principle Findings: Approximately 60% of subjects reported one or more psychiatric comorbidities. Depression was the most common comorbidity, which was observed among 58% of the sample. 35% of the subjects dropped out of treatment before receiving an amount of treatment that was considered clinically beneficial. Depression was significantly associated with treatment dropout (HR = 1.38, 95% CI = 1.16-1.73). Over half the subjects reported a mental health service need, but only one-third received any type of mental health services during their treatment episode. Unmet service needs were not found to be associated with an increased risk of dropout.
Conclusions: This research shows that depression was significantly associated a risk of dropout. Depression may increase risk by eroding beliefs in the efficacy of treatment or reducing treatment motivation. Providing

treatment for depression in substance abuse treatment may increase the number of people who complete at least an adequate amount of treatment.
Implications for Policy, Practice or Delivery: The high prevalence of depression and association with dropout underscores the importance of assessing for psychiatric problems among persons in substance abuse treatment. Substance abuse treatment programs should have established procedures for linking persons to treatment if on-site treatment is not available.
Funding Source: NIDA

- The Role of State Governance in the Adoption of Pharmaceutical Technologies in Substance Abuse Treatment

Carolyn Heinrich, Ph.D., Carolyn J. Hill, Ph.D.

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Research Objective: We address an important gap in our understanding of whether and how state-level policies and other governance factors erect barriers or provide positive incentives for facility-level adoption of naltrexone by examining state policy, institutional, and environmental factors associated with its adoption in the treatment of alcohol dependent clients.
Study Design: We apply a multilevel approach to both the conceptualization of relationships and empirical analysis, focusing on policy or governance factors at the state level while simultaneously investigating (and controlling for) the role of facility characteristics in naltrexone adoption decisions. We estimate generalized linear mixed models using data collected on state policies and other relevant environmental factors that are linked to information from the National Survey of Substance Abuse Treatment Services (N-SSATS), a nationally representative survey of substance abuse treatment facilities. Using these data, we test hypotheses about the relationships of state- and facility-level factors to naltrexone adoption, focusing in particular on state strategies aimed at limiting the costs or use of substance abuse treatment services and pharmacotherapies.
Population Studied: The population studied are the 13,623 substance abuse treatment facilities in the 2003 N-SSATS linked to data from the 50 states and the District of Columbia.
Principle Findings: We find effects of facility characteristics such as treatment focus, affiliation, ownership status, licensing and accreditation, supportive service provision and others that are consistent with prior research on naltrexone adoption. Importantly, we also identify a strong role for specific state policies that facilitate or impede affordable access to pharmacotherapies and influence facility decisions to adopt naltrexone. State Medicaid policies that support the use of generic drugs and reduce their costs and that also permit managed care organizations to establish policies that encourage the use of generics increased the odds of naltrexone adoption significantly. Conversely, states that limit access to pharmaceutical technologies through Medicaid preferred drug lists, restricted access to pharmacy networks, and general limitations on the use of Medicaid benefits for rehabilitation for substance abuse treatment reduce treatment facilities' adoption of naltrexone. Other aspects of state capacity for financing and supporting substance abuse treatment were also important to naltrexone adoption, including state public welfare expenditures and adequate mental health professional staffing in counties.
Conclusions: This study suggests that states do have at their disposal valuable policy levers for more aggressively promoting the adoption of pharmaceutical technologies such as naltrexone in addiction treatment.
Implications for Policy, Practice or Delivery: We expect the findings of this study that identify specific policy instruments and barriers to the adoption of naltrexone in substance abuse treatment to have implications not only for increasing the use of naltrexone in treating alcohol-dependent clients, but also for the adoption of naltrexone for other uses such as the treatment of heroin abuse and nicotine dependence (i.e., smoking cessation). In addition, naltrexone is just one example of a health care technology whose use and dissemination has been limited by policy, organizational, and environmental factors. These results should have implications for the adoption of other technologies and pharmaceutical agents, such as buprenorphine in the treatment of heroin addiction.
Funding Source: RWJF

▪ Resource Use & Costs Associated with Behavioral Intervention Targeting Smoking Reduction

Anna Sukhanova, M.A., Debra P. Ritzwoller, Ph.D., Bridget Gaglio, M.P.H., Russell E. Glasgow, Ph.D.

Presented By: Anna Sukhanova, M.A., Research Specialist, Clinical Research Unit, Kaiser Permanente (Colorado), 10065 E. Harvard Avenue, Suite #300, Denver, CO 80231, Phone: (303) 614-1233, Fax: (303) 614-1225, Email: anna.sukhanova@kp.org

Research Objective: Given the plateau in smoking cessation rates in the U.S and decreasing number of smoking population willing to make a quit attempt, a greater interest has emerged in behavioral interventions targeting smoking harm reduction. Little is known regarding the costs of these types of interventions relative to their outcomes. Due to the lack of indicative data and policy makers' increasing demands on program effectiveness, cost and cost-effectiveness analyses serve as valuable tools in the evaluation process for various behavioral interventions. This paper describes the evaluation of the cost and cost-effectiveness of smoking reduction in a randomized trial.
Study Design: The 6-month theory-based intervention consisted of a combination of CATI-based telephone counseling and tailored newsletters. Usual care (UC) subjects received mailed generic health education materials. Using data prospectively collected during the implementation phase of the project, we estimated total intervention costs relative to the UC condition, the incremental invention costs per patient, and the marginal costs per incremental improvement in study outcomes. To evaluate the cost estimates under a variety of settings and scenarios, sensitivity analyses were conducted using variations in inflation rates, implementation settings, labor and non-labor inputs, and market wage rates.
Population Studied: This intervention targeted Kaiser Permanente Colorado health plan members who were identified as smokers and who were scheduled to undergo an outpatient invasive medical or diagnostic procedure.
Principle Findings: Of the 320 enrolled study participants, 164 were randomized to the intervention arm and 156 to UC. Relative to UC, significantly more intervention subjects achieved a 50% reduction in the number of cigarettes smoked per day. UC costs were estimated at $7,800 over the period of 6 months. Excluding the recruitment costs, total 6-month intervention costs were $100,869 ($86,562 direct costs), for a marginal cost of $567.50 per intervention participant relative to UC ($480.30 direct costs). This translates to $100.49 per incremental reduction in cigarettes, or $4,523.27 per average number of patients that reduced smoking by 50%. Approximately 20% of direct costs were associated with the telephone counselors. Sensitivity analyses revealed recruitment costs could be significantly reduced if all smokers were targeted, rather than just those with scheduled outpatient events. Possible cost range for smoking reduction program was estimated between $80,695.20 and $126,086.25.
Conclusions: Sensitivity analyses highlighted several areas for potential cost-efficient substitution. Recruitment and intense monitoring processes were identified as areas that can be more efficiently performed. However, non-professional telephone counselors, low mailing costs, and the relatively inexpensive technique of subject identification stood out as the most cost-efficient intervention methods. Analyses further indicated potential reduction in costs obtainable through the implementation of interactive voice response or nicotine replacement therapy.
Implications for Policy, Practice or Delivery: Our paper has demonstrated that providing a relatively intense behavioral smoking reduction program is associated with modest incremental costs, making the program potentially appealing to policy makers and health minded organizations. In an effort to increase the number of options available to smokers seeking help; this program could become an alternative to smoking cessation options currently offered by health care organizations and could be a potential benefit for to hard to reach smokers.
Funding Source: NCI

Mental Health & Primary Care

Chair: Benjamin Druss, M.D., M.P.H.

Tuesday, June 5 • 10:45 a.m.-12:15 p.m.

▪ National Mental Health Medication Prescribing Patterns

Tami Mark, Ph.D., M.B.A., Cheryl Kassed, Ph.D., Katheryn Ryan, Mika Nagamine, Ph.D., Rosanna Coffey, Ph.D.

Presented By: Katharine Levit, Senior Researcher, Thomson Healthcare, 4301 Connecticut Avenue, NW Suite 330, Washington, D.C. 20008, Phone: (202) 719-7835 Email: katharine.levit@thomson.com

Research Objective: The surge in spending on mental health drugs during the 1990s has been accompanied by new trends in the types of physician specialties that are prescribing these medications. Increasingly, primary care physicians (PCPs) are writing scripts to treat a wide range of mental health conditions. In this presentation we will describe mental health medication prescribing patterns of psychiatrists and PCPs in 2000, 2002, and 2004 and discuss the implications of these changing patterns on the quality and adequacy of care for mental illness.
Study Design: This study is based on data for 2000-2004 from IMS' National Prescription Audit (NPA) PlusTM database—a weighted sample of 20,000 retail pharmacies. This database provides information on the volume and retail cost of prescriptions. Transactions in retail pharmacies, including those at chain, independent, food store and mass merchandiser pharmacy retail outlets, cover approximately three-quarters of all prescription filled in the United States. The database does not include mail order transactions, transactions at pharmacies in HMOs serving members only, hospitals, or clinics, or drugs directly dispensed by physicians or home health agencies.
This study also uses physician specialty information that is assigned by IMS based primarily upon the Drug Enforcement Administration number for each physician.
The study focuses on drugs that are used primarily to treat mental illness and are here after referred to as 'mental health drugs.'
Population Studied: U.S. population
Principle Findings: Mental Health Drugs as a Proportion of All Prescriptions: Community pharmacies filled 3.1 billion prescriptions in 2004. Approximately 12% were for mental health drugs. From 2000 to 2004, the number of prescriptions for all types of medications rose at a 3.2% average annual rate. For mental health drugs, the rate of growth was even faster—5.7% annually. Spending for mental health drugs (up 13.7% annually) grew more rapidly than spending for all drugs (up 11.8% annually) between 2000 and 2004. Types of MH Drugs Prescribed. Of the 375 million scripts filled for drugs that treat mental health disorders in 2004, 46% were for antidepressants. The next largest categories of mental health drugs are anxiolytic/sedative/hypnotic benzodiazepines (20%), anxiolytic/sedative hypnotics (12%), tranquilizers and antipsychotic (9%), stimulants (8%) anticonvulsant benzodiazepines (4%), antimanic agents (1%). Primary Care Physician (PCP) Prescribing. PCPs prescribed 59% of all antidepressants, 64% of all anxiolytic/sedative/hypnotic benzodiazepines, 55% of stimulants, and 63% of anxiolytic/sedative hypnotics. PCPs prescribe a disproportionately smaller share of drugs used to treat the most severe mental health disorders: anticonvulsant benzodiazepines (43%), tranquilizers and antipsychotics (23%), and antimanic drugs (18%). For PCPs, mental health scripts represented 11% of the scripts they wrote in 2004, a share that has grown from 9% four years earlier. PCPS were responsible for writing prescriptions that accounted 47% of all spending on mental health drugs in 2004. Scripts written by psychiatrists were responsible for 36% of mental health drug spending.
Conclusions: Primary care physicians play a large and increasing role in psychoactive drug prescribing.
Implications for Policy, Practice or Delivery: The fact that large portion of mental health drugs are prescribed by PCPS highlights the importance of providing appropriate education about psychoactive medications to all physicians and of assuring that patients receive adequate levels of medication monitoring.

- **Does Guideline Level Care Explain Primary Care Depression Treatment Outcomes? Results from the PRISM-E Study**

Ashley Dunham, Ph.D., M.S.P.H., Marisa Elena Domino, Ph.D., Bradley N. Gaynes, M.D., M.P.H., Joseph P. Morrissey, Ph.D.

Presented By: Ashley Dunham, Ph.D., M.S.P.H., Postdoctoral Fellow, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, 725 Martin Luther King, Jr. Boulevard., Chapel Hill, NC 27599, Phone: (919) 966-6156, Fax: (919) 966-1634, Email: adunham@schsr.unc.edu

Research Objective: The objective of this research was to explore if the presence of guideline level treatment for patients with major depressive disorder (MDD) participating in the Primary Care Research in Substance Abuse and Mental Health for the Elderly (PRISM-E) study explained why patients assigned to the enhanced referral branch had significantly better outcomes,

as compared to those patients assigned to the integrated care branch. The importance of this research is reinforced by the fact that the integrated care setting (with poorer six-month outcomes) was not only preferred by clinicians, but was able engage a significantly larger percentage of their patients.
Study Design: The PRISM-E study was a randomized trial comparing integrated behavioral health care with enhanced referral care in primary care settings across the United States. Using only those patients with MDD, treatment episodes indicating the presence of guideline level care were constructed to explain differences in 6-month outcomes between those assigned to referral care and those assigned to integrated care for treatment. This design is hypothesized to explain why study participants were more likely to engage in mental health treatment in the integrated branch, but had better outcomes in the referral branch.
Population Studied: A total of 24,930 primary care patients age 65 and older were screened for a mental health disorder or at-risk drinking between March 2000 and October 2001. After necessary exclusions, a final study group comprised 2,022 patients who met criteria, gave informed consent, and were randomly assigned to receive integrated behavioral health care (n=999) or enhanced referral care (n=1,023). There were no significant differences in demographic characteristics between patients randomly assigned to the integrated branch and those assigned to the referral branch. Only those diagnosed with MDD (n=556) and those who were dually diagnosed with MDD and anxiety (n=303) were used for this research.
Principle Findings: Initial finding show that patients with MDD only in the integrated setting had an average of 3.6 total treatment visits during the 6-month treatment period, as compared to a mean of 2.0 for the referral group. For those patients dually diagnosed with MDD and anxiety, the integrated group had an average of 4.0 visits while those in the referral group had an average of 2.7. With the exception of visits to a psychiatrist, the enhanced referral care group had on average fewer visits in all other visit types recorded for both the MDD and dually diagnosed group. The enhanced referral group had significantly more visits to a psychiatrist. There were no significant differences in the utilization of antidepressant/anti-anxiety medication between the integrated and enhanced referral groups at baseline, 3-month, and 6-month follow-ups.
Conclusions: Initial findings suggest that the level of care delivered cannot explain why there were better 6-month outcomes for those with MDD in the enhanced referral group. Further analyses will explore episodes of treatment to better understand if there were differences in care between the two groups, particularly if better medication management by a psychiatrist explained better outcomes for the enhanced referral group.
Implications for Policy, Practice or Delivery: Futher research should explore the PRISM-E data in an attempt to explain why better outcomes for those with MDD were achieved with the enhanced referral group, but both patients were more engaged and clinicians were more satisfied with the integrated care arrangement. Those differences that achieve better outcomes should be incorporated into an integrated setting that engages more patients and supports clinician satisfaction.
Funding Source: NIMH, SAMHSA

- **Specialty Differences in Appropriate Psychotropic Dosing for Adults**

Michael Ong, M.D., Ph.D., Bo Liu, M.S., Eric Hamilton, M.S., Edward Jones, Ph.D., Jeb Brown, Ph.D., Susan Ettner, Ph.D.

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Research Objective: Many mentally ill individuals, even those with access to the mental health specialty sector, receive psychotropic drug treatment from non-specialty providers. We tested the hypothesis that individuals whose psychotropic drug prescriptions were obtained from a mental health specialist were more likely to receive appropriate treatment.
Study Design: Prescription episodes were generated by linking psychotropic drug prescriptions less than 30 days apart. We examined differences among episodes in which prescriptions were provided by psychiatrists only, primary care providers (PCPs) only, all other types of specialists only, and by more than one type of provider. Appropriateness was measured by dosing within recommended limits derived from Micromedex age-specific minimum and maximum recommended dose ranges, and by duration of episode of treatment. Multinomial probit models were used for dosing analyses and

proportional hazards models for duration of episode analyses, with controls for age and gender. Episodes were considered inappropriate if any prescription claim in the episode had a dosage outside recommended dose ranges; tapered prescriptions were not considered inappropriate.
Population Studied: We examined all antidepressant (n = 222,033), antipsychotic (n = 47,882), and anxiolytic (n = 140,859) prescription drug claims made by adults (n = 195,421) to a pharmaceutical benefit carve-out vendor associated with a large national managed behavioral health organization between 2000-2004. Study individuals were restricted to those who had ever used specialty mental health care during the time period to exclude confounding effects from specialty mental health care inaccessibility, and claims were restricted to 2001-2004 to minimize truncation error.
Principle Findings: For psychiatrists, the predicted probabilities that prescription episodes had all doses within recommended limits ranged from 86% to 94%, and average episode duration ranged from 85 days to 151 days. In all three drug classes, PCPs and other specialists had significantly higher ($p < 0.05$) levels of dosing within recommended limits than psychiatrists (predicted probability difference 2% to 8% for PCPs, 1% to 5% for other specialists). Prescription episodes provided by multiple provider types had significantly lower ($p < 0.05$) levels of dosing within recommended limits than psychiatrists (predicted probability differences 20% to 26%). Dosing outside recommended limits was generally due to underdosing. Duration of prescription episodes provided by multiple provider types was significantly longer ($p < 0.05$) than those provided by psychiatrists (hazard ratios 0.46 to 0.53). Duration of prescription episodes provided by PCPs and other specialists was significantly shorter ($p < 0.05$) than those provided by psychiatrists (hazard ratios 1.14 to 1.75 for PCPs, 1.15 to 1.59 for other specialists).
Conclusions: PCPs and other specialists are more likely than psychiatrists to prescribe psychotropic drugs within recommended dosing limits and for shorter duration. Prescription episodes that involve multiple provider types are more likely than those involving a single type to fall outside of recommended dosing limits and to have longer duration.
Implications for Policy, Practice or Delivery: Inappropriate prescription drug dosing and duration appears to be high when multiple types of providers provide psychotropic medications; better coordination of care could reduce inappropriate prescriptions from multiple types of providers.
Funding Source: NIMH

- **Genetic Factors in Health Service Use & Self-Reported Health**

James Romeis, Ph.D, Hong Xian, Ph.D., Seth Eisen, M.D., M.Sc., Nancy Pedersen, Ph.D., Andrew Heath, D.Phil.

Presented By: James Romeis, Ph.D, Professor of Health Serivices Research, Health Mangement & Policy, Saint Louis University School of Public Health, 3545 Lafayette, St. Louis, MO 63104-1314, Phone: (314) 977-8148, Fax: (314) 977-1674, Email: romeisjc@slu.edu

Research Objective: This study is part of a larger body of work intended to assess genetic and environmental factors on health services use and its outcomes.
Study Design: The study is a secondary analysis of the 1995 NIAAA Survey of Alcoholism and Health Services Use. The analytical strategy is a Cholesky decomposition of variance accounting for genetic and environmental influences on condition, health services use and self-reported health.
Population Studied: The population studied is derived from a random sample of 1,821 MM pairs of Viet Nam Era survey veterans who matched DSM III-R criteria for life time alcohol dependence and 200 MM pairs of Viet Nam Era survey non-alcohol dependent controls.
Principle Findings: The principal findings are that genetic factors account for 55% of condition with small but significant amounts of genetic influence related to health servies use [2%] and self-reported health [10%]. Unique genetic influence on health services use accounts for 41% of the variance. Genetic influences on health services use are also related to self-reported health [7%]. Finally, unique genetic influence on self-reported health as an outcome accounts for 29% of the variance with the remainder of the variance accounted for by environmental factors and error.
Conclusions: The results of this study point to genetic influences as significant predictors and outcomes of health services. Current models of health services either do not account for genetic influences or are mis-specified.
Implications for Policy, Practice or Delivery: Lack of attention on geneitc influences in health services analyses, especially those associated with high risk health behaviors, may significantly

affect our policies for these populations. A better understanding of genetic factors may influence interventions, outcomes and costs.
Funding Source: NIA, NIAAA, VA-HSR&D

▪ The Effect of Health Insurance Characteristics on Outpatient Mental Health Care & Substance Abuse Treatment Utilization among Privately-Insured Employees & their Dependents

Laura J. Dunlap, Ph.D., Edward C. Norton, Ph.D., Gary A. Zarkin, Ph.D.

Presented By: Laura J. Dunlap, Ph.D., Research Economist, Behavioral Health Economics Program, RTI International, 6110 Executive Boulevard, Suite 902, Rockville, MD 20852, Phone: (301) 816-4616, Fax: (301) 230-4647, Email: ljd@rti.org

Research Objective: The objective of this study is to estimate the effect of specific MH/SA health insurance characteristics on outpatient utilization of mental health and substance use treatment services for privately-insured employees and their dependents.
Study Design: We use a two-part model to estimate the effect of MH/SA health insurance characteristics on the likelihood of any use of outpatient MH or SA services and, conditional on use, the number of outpatient days. Our models include 4 variables representing MH/SA health insurance coverage, including three different measures of coinsurance rates and whether the health plan required precertification by the company's employee assistance program (EAP) prior to MH/SA service use. Any use is modeled using a random-effects logit model and days of use is modeled using a random-effects negative binomial model. Data used are private insurance enrollment and claims data for 1997-1998 from MEDSTAT's Marketscan® database.
Population Studied: National population of privately-insured employed individuals and dependents.
Principle Findings: We find that the outpatient coinsurance rate for in-network MH/SA is negatively and significantly associated with any outpatient MH use indicating that as the individual's expected out-of-pocket expense increases their likelihood of use decreases, although the estimated marginal effect is quite small. Among health insurance characteristics, the strongest predictor of MH use is the EAP precertification requirement which is negatively associated with MH use. Our analysis of substance use treatment finds little significant association between MH/SA health insurance variables and outpatient SA treatment utilization.
Conclusions: Our findings suggest that employees and their dependents do respond to expected out-of-pocket expenses for outpatient MH care, but this response is very small. Furthermore, MH/SA health characteristics appear to have little or no effect on SA treatment utilization. Finally, our results indicate that the role of an EAP is not straightforward. Rather than facilitating treatment access, EAP precertification may create an obstacle to treatment and discourage utilization. However, it is also possible that EAP precertification may decrease utilization through the formal health care system by providing some MH/SA services. Individuals with milder conditions may receive an adequate dose of services through the EAP and, therefore, not need additional services.
Implications for Policy, Practice or Delivery: The response to insurance copayment mechanisms was extremely small suggesting that making insurance coverage more favorable towards MH/SA treatment would not necessarily result in greater utilization. Non-economic factors may play a larger role in treatment utilization decisions, at least among privately-insured individuals. Using an EAP for precertification had a negative effect on treatment utilization. If EAP precertification decreases utilization in the formal health care system by helping employees and their dependents identify their MH/SA problems and obtain appropriate care, this suggests that firms with an EAP may avoid costly care by implementing EAP precertification as part of their health plan. However, if EAP precertification creates an unintentional obstacle to treatment and discourages utilization, then insurers and employers may want to reconsider this method. Given our lack of understanding regarding the role that the EAP plays in MH/SA service utilization—one of facilitator or one of inadvertent obstacle—it is apparent that more research in this area is needed.

Pharmacoepidemiology

Chair: Jalpa Doshi, Ph.D.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

▪ The Impact of a Pharmacy-Based Intervention on Antipsychotic Adherence among Patients with Serious Mental Illness

Marcia Valenstein, M.D., M.S., Janet Kavanagh, M.S., Dara Ganoczy, M.S., Todd Lee, PharmD, Ph.D., David Smelson, Ph.D., Agnes Jensen, B.A.

Presented By: Marcia Valenstein, M.D., M.S., Research Scientist, University of Michigan, Department of Psychiatry, Dept Veterans Affairs HSR&D, P.O.Box 130170, Ann Arbor, MI 48113-0170, Phone: (734) 769-7100, Fax: (734) 761-2617, Email: marciav@umich.edu

Research Objective: Anti-psychotic medications are an essential component of the treatment of patients with schizophrenia, reducing rates of relapse and rehospitalization. Many patients with bipolar disorder also require long-term antipsychotic maintenance to maintain stability. However, poor adherence with antipsychotic medications is common. We conducted a randomized controlled trial of a practical, pharmacy-based intervention designed to improve antipsychotic adherence among patients with serious mental illness.
Study Design: Using pharmacy data, we identified patients with schizophrenia or bipolar disorder who received antipsychotic medication and completed at least two outpatient mental health visits at one of four VA facilities. We calculated antipsychotic medication possession ratios (MPRs) and confirmed patients' diagnoses and clinician intention to use long term antipsychotics for those with MPRs <0.8. We randomized patients to either: 1) usual care or 2) the Pharmacy Based Adherence Facilitation (PBAF) intervention. The PBAF intervention consisted of usual care plus a) aligning the "refill dates" of patient's medications, b) using "unit-of-use" adherence packaging that included all medications, c) an education session, e) refill reminders, and e) clinician notification of missed fills. We reassessed patients' antipsychotic MPRs at 12 months post-enrollment.
Population Studied: 150 VA patients with schizophrenia or bipolar disorder who were poorly adherent with their long-term antipsychotic medication.
Principle Findings: At baseline, the mean MPR of patients in the intervention and control groups was 0.61 and 0.63, respectively. At 12 months follow-up, the mean MPR for the intervention and control groups was 0.85 and 0.69, respectively; 66% of patients in the intervention group and 37% of patients in the control group had MPRs >0.8. In linear regression analyses that adjusted for baseline MPR, race, age, and concurrent substance use, enrollment in the intervention group was significantly associated with improved adherence (higher MPRs) at follow-up ($p<.0001$). In logistic regression analyses, patients enrolled in the intervention group had an OR of 4.5 for meeting criteria for "good adherence" (MPRs >0.8) compared to patients in the control group.
Conclusions: This practical, low-complexity intervention appears to be effective in increasing antipsychotic adherence among patients with serious mental illness.
Implications for Policy, Practice or Delivery: VA patients with serious mental illness who are poorly adherent with their antipsychotic medications suffer considerable morbidity. By improving adherence, this pharmacy-based intervention may improve the outcomes of these patients.
Funding Source: VA

- **Mood Stabilizer & Anticonvulsant Prescription Refill Persistence in Bipolar Disorder: Disparities & Co-occurring Conditions**

Scott Bilder, M.S., James Walkup, Ph.D., Alexis Sohrakoff, B.A., Stephen Crystal, Ph.D.

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Research Objective: Despite the widespread availability of effective pharmacological treatment for bipolar disorder, rates of medication compliance are low. The objective of this study was to examine patterns of prescription refill persistence for mood stabilizers and anticonvulsants among Medicaid enrollees with bipolar disorder. Particular attention was focused on differences in refill persistence associated with race/ethnicity, sex, age, HIV/AIDS status, and presence of co-occurring psychiatric and substance abuse conditions.
Study Design: This retrospective study examined rates of prescription persistence using Medicaid Analytic Extract (MAX) data for five states for 1999-2000. Mood stabilizer and anticonvulsant prescription refill information was merged with diagnostic data from claims histories. Prescription refill persistence was operationalized as a Medication Possession Ratio (MPR) indexing the proportion of days, based on prescription fill dates and days

supplied, that an enrollee had a mood stabilizer or anticonvulsant available.
Population Studied: The study population included Medicaid enrollees aged 18-64 in five states for the years 1999-2000. Inclusion criteria, which could be met for either 1999 or 2000, included (a) full-year Medicaid eligibility, (b) no comprehensive managed care coverage, and (c) no days spent in a long-term care facility. Analyses of mood stabilizer and anticonvulsant use were limited to persons with bipolar disorder (N=46,636), and analyses of refill persistence were limited to persons with one or more mood stabilizer or anticonvulsant prescriptions during the observation period (N= 33,387).
Principle Findings: Differences in mood stabilizer and anticonvulsant use and refill persistence were associated with race/ethnicity and presence of co-occurring conditions. African American and Latino enrollees with bipolar disorder were significantly less likely than whites to have received a prescription in 1999-2000 (61% and 58% vs. 76%). Among those who did receive mood stabilizers or anticonvulsants during that period, African Americans and Latinos had the drugs available for significantly fewer days than did whites (75% of days for African Americans and Latinos vs. 79% of days for whites). Individuals with HIV/AIDS were significantly less likely (65% vs. 72%) than the general population of persons with bipolar disorder to have received any mood stabilizer or anticonvulsant prescription, and they had significantly lower rates of refill persistence (74% of days vs. 79%). Presence of co-occurring conditions, particularly drug or alcohol abuse, was associated with lower rates of persistence (74% and 72% of days for drug and alcohol conditions, respectively vs. 79%), but not with lower rates of use. Multivariate models, as well as results from bivariate analyses focusing on sex and age, are being examined in follow-up analyses.
Conclusions: Results indicate the presence of significant disparities in use of, and persistence with, mood stabilizers and anticonvulsants. African American and Latino Medicaid enrollees appear to be at a significant disadvantage in receipt of appropriate pharmacological care. Persons with HIV/AIDS and substance abuse conditions are at a similar disadvantage.
Implications for Policy, Practice or Delivery: Efforts aimed at improving pharmacological care of persons with bipolar disorder should focus on (a) the mechanisms underlying the observed racial/ethnic differences in use and persistence, and (b) the appropriate management of co-occurring medical and substance abuse conditions.
Funding Source: NIMH

- **Discontinuities in Atypical Antipsychotic Therapy Following Prior Authorization & Step Therapy among Medicaid Beneficiaries with Schizophrenia**

Stephen Soumerai, Sc.D., Fang Zhang, Ph.D., Dennis Ross-Degnan, Sc.D., Daniel E Ball, M.B.A., Robert F LeCates, M.A., Alyce S Adams, Ph.D.

Presented By: Stephen Soumerai, Sc.D., Professor, Ambulatory Care and Prevention, Harvard Medical School and Harvard Pilgrim Health Care, 133 Brookline Avenue, 6th Floor, Boston, MA 02215, Phone: (617)509-9942, Fax: (617)859-8112,
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Research Objective: Prior authorization (PA) and step therapy policies are increasingly used by Medicaid and Medicare to control expenditures for costly atypical antipsychotics agents (AA). Little is known about whether these policies affect continuity of medication use among mentally ill patients. We investigated the impact of a combined step therapy and PA policy in Maine on AA use, AA discontinuities, and AA expenditures among non-elderly Medicaid patients with schizophrenia.
Study Design: We used a strong quasi-experimental design, the interrupted time-series with comparison series design, to evaluate the effects of the policy. We obtained Maine (policy) and New Hampshire (control) Medicare and Medicaid utilization data for 2001-2004. The PA policy ran from July, 2003 through February, 2004.
Population Studied: We used time-series segmented regression analysis to measure overall changes in AA use and AA expenditures among continuously enrolled schizophrenia patients in both states (N=4,600). We used survival analysis to analyze policy effects on treatment discontinuities (AA treatment gaps of >30 days or switching/augmentation of initial AA) among newly treated patients (N = 683) before (7/02-2/03) and during the policy (7/03-2/04).
Principle Findings: The proportion of patients newly treated with non-preferred agents declined from 40.7% (95%CI: 35.2%, 46.3%) to 28.9% (95%CI: 23.6%, 34.3%) during the policy. Use of the first-preferred agent increased from 29.0% (95%CI: 23.8%, 34.1%) to 39.2% (95%CI: 33.4%,

45.0%). The policy cohort had a 1.33 [95%CI: (1.04, 1.70)] greater hazard of treatment discontinuity relative to the pre-policy cohort. Medication gaps accounted for 70.8% of discontinuities; augmentations, 23.2%; and switching, 6.0%). No similar changes in market share of AA medications or rates of treatment discontinuities were observed in the comparison state. There was a $2.33 per patient per month decrease in trend of AA expenditures (95%CI:-3.56, -1.10) during the policy; however, a similar decrease occurred in the comparison state.
Conclusions: In this study of a combined step therapy and PA policy for AAs we observed a 33% increase in AA treatment discontinuities and minimal drug savings. The most frequent adverse outcome was AA treatment discontinuation, a strong predictor of acute psychotic episodes and hospitalization, as well as other negative clinical and economic outcomes.
Implications for Policy, Practice or Delivery: At least ten Medicaid and several Medicare drug plans have instituted PA and/or required trials of preferred AA agents. These empirical data suggest further consideration of the need to exempt antipsychotic medications and populations with chronic mental illness from PA and step therapy requirements in Medicaid and Medicare until more is known about the clinical and economic consequences of such policies for vulnerable patients with chronic mental illness.
Funding Source: Eli Lilly and Company

- **Patterns of Psychotropic Medication Use among Older Adolescents in Foster Care**

Ramesh Raghavan, M.D., Ph.D., J. Curtis McMillen, Ph.D.

Presented By: Ramesh Raghavan, M.D., Ph.D., Assistant Professor of Social Work and Psychiatry, George Warren Brown School of Social Work, Washington University in St. Louis, Campus Box 1196, One Brookings Drive, St. Louis, MO 63130, Phone: (314) 935-4469, Fax: (314) 935-8511, Email: raghavan@wustl.edu

Research Objective: To estimate the prevalence and patterns of psychotropic medication use among older youth in foster care.
Study Design: Consecutive sample of youth in foster care in a Midwestern state. Youth about to age out of foster care were identified by the state child welfare system. Trained interviewers conducted in-person interviews within participants' homes between December 2001 and June 2003. Outcome variable was number of psychotropic medications currently consumed by participants, validated by medication container audits where available. Predictors included sociodemographic characteristics, history and type of maltreatment, current placement status, history of stability of placement, and current (past 12 months) DSM-IV psychiatric diagnosis as obtained from the Diagnostic Interview Schedule. Information on type of provider (specialty or non-specialty) seen by the youth was also obtained. We developed zero-inflated negative binomial regression models to estimate odds of medication use adjusting for individual-level characteristics, and provider type.
Population Studied: 403 adolescents aged 17 years about to age out of foster care in a Midwestern state. Data were obtained from in-person interviews conducted with these participants
Principle Findings: Overall counts of concurrent psychotropic medications ranged from 0 to 6. Most youth (63%) reported taking no psychotropic medications at all, while 15% reported being on 1, 10% on 2, 6% on 3, 4.5% on 4, 1.5% on 5, and 2 children (0.5%) on 6 medications simultaneously. Antidepressants, atypical antipsychotics, and anticonvulsants were the commonest medications prescribed. Diagnoses of bipolar disorder and attention deficit/hyperactivity disorder were associated with greater medication use. For the zero-inflated negative binomial regression model, we modeled the odds of never receiving medications (the inflation equation) separately from the odds of receiving medication for those who did receive medications (the use equation). Youth who saw either a specialty or non-specialty provider (OR=3.3 and 2.5, respectively), and who were placed in foster care or a congregate care environment (OR=4.8) had significantly higher odds of receiving any medications. Youth with histories of neglect had 0.4 times the odds of receiving any medications compared to physically and sexually abused youth. In the use equation, youth with a greater number of different types of placement (OR=1.1), with a greater number of different types of maltreatment (OR=1.2), and with diagnoses of either bipolar disorder (OR=1.5) or major depressive episode (OR=1.5) had significantly higher odds of receiving more medications. Youth of color had 0.6 times the odds of receiving medications controlling for demographic characteristics, maltreatment history, and psychiatric diagnoses.
Conclusions: Older youth in the child welfare system are receiving psychotropic medications at

rates exceeding that of children in the community. Youth with history of severe maltreatment, and with diagnoses of mood disorders constitute an at-risk group for polypharmacy.
Implications for Policy, Practice or Delivery: Child welfare agencies should consider medication audits of children stratified by diagnoses to assess the appropriateness of such prescribing. If medication use is needed, these findings underline the need to extend Medicaid coverage to youth aging out of foster care to safeguard their mental health.
Funding Source: National Institute of Mental Health

- Medicare Part D Prescription Drug Benefits: Impact on Medication Access & Continuity among Dual Eligible Psychiatric Patients

Joyce West, Ph.D., M.P.P., Joshua E. Wilk, Ph.D., Irvin L. Muszynski, J.D., Donald S. Rae, M.S., Maritza Rubio Stipec, Sc.D., Darrel A. Regier, M.D., M.P.P.

Presented By: Joyce West, Ph.D., M.P.P., Director, APIRE Psychiatric Research Network, 1000 Wilson Blvd, Arlington, VA 22209, Phone: (703) 907-8619, Fax: (703) 907-1087, Email: JWest@psych.org

Research Objective: Systematically assess the experiences of a large, national sample of Medicare and Medicaid "dual eligible" psychiatric patients during the first four months of the Medicare Part D Prescription Drug Benefit. The primary aims are to: 1) Systematically quantify the extent and nature of any medication access or continuity problems and any improvements in medication access or continuity; 2) Quantify the extent of any adverse clinical events reported to have occurred as a result of unintended medication disruptions or access problems, including hospitalizations, emergency room visits, homelessness, and injury to self or others; 3) Identify specific patient groups at increased risk for medication access problems; and 4) Evaluate the administrative functioning and requirements of the Medicare Prescription Drug Plans (PDPs).
Study Design: This observational, practice-based reserach study was conducted among a large, national sample of 5,833 psychiatrists who were randomly selected from the AMA Physicians Masterfile. 64% responded to the survey, reporting clinically detailed data on one systematically selected patient and on features and experiences of their caseload.
Population Studied: Although this study only examines patients of psychiatrists, this group is of particular interest since psychiatrists treat the majority of the nation's individuals receiving treatment for schizophrenia and others with the most severe forms of mental illnesses. Most of these patients are on clinically complex medication regimens, receiving multiple medications.
Principle Findings: 53.4% of the patients had at least one problem with medication access or continuity reported by their psychiatrist since January 1, 2006; 9.7% of patients were reported to have improved medication access or continuity. 22.3% of patients discontinued or temporarily stopped their medication because of prescription drug plan coverage, management or administrative issues; 18.3% were previously stable on their medications but had to switch to a different medication than clinically desired because medication refills were not covered or approved. 27.3% of the psychiatric patients with medication access problems were reported to have experienced a significant adverse clinical event, with 19.8% having an ER visit. Patients with prior authorization, preferred drug or formulary lists, "step therapy" or "fail first protocols," requirements to switch to generics, limits on the number or dosing of medications, or protocols for transitioning patients on stable medication regimens to preferred medications were significantly more likely to experience a medication access or continuity problem ($p < .001$) and have a significant adverse clinical event as a result ($p < .001$).
Conclusions: These findings indicate significant medication access and continuity problems during the initial implementation of Medicare Part D.
Implications for Policy, Practice or Delivery: Although CMS policies were enacted to ensure access to protected classes of psychopharmacologic medications for this population, the high rates of medication access problems observed indicate further refinement of these policies is needed.
Funding Source: American Psychiatric Institute for Education and Research

Child Health

Preventive Services to End-of-Life Care: Challenges in the Care of Vulnerable Children

Chair: Michelle Mayer, Ph.D., M.P.H., R.N.

Sunday, June 3 • 11:00 a.m.-12:30 p.m.

▪ Effects of Pediatric Asthma Education on Emergency Department Visits & Hospitalizations: A Meta-Analysis

Janet Coffman, Ph.D., Michael D. Cabana, M.D., M.P.H., Helen Ann Halpin, Ph.D., Edward H. Yelin, Ph.D.

Presented By: Janet Coffman, Ph.D., Senior Research Analyst, Institute for Health Policy Studies, University of California, San Francisco, 3333 California Street, Suite 265, San Francisco, CA 94118, Phone: (415) 476-2435, Fax: (415) 476-0705, Email: Janet.Coffman@ucsf.edu

Research Objective: To improve the quality of asthma care, NIH clinical practice guidelines strongly recommend that health professionals educate children with asthma and their caregivers about self-management. A wide variety of asthma education programs for children have been implemented and evaluated over the years. However, results have been mixed and many studies did not enroll sufficient numbers of children to detect differences in health care utilization. A meta-analysis was conducted to synthesize findings from controlled trials of the effects of pediatric asthma education on emergency department (ED) visits and hospitalizations.
Study Design: The meta-analysis examined the effects of pediatric asthma education on mean numbers of ED visits and hospitalizations, and on the odds of having one or more ED visits or hospitalizations. Pooled standardized mean differences (SMDs) and pooled odds ratios (ORs) were calculated using the inverse variance and Mantel-Hanzel methods, respectively. Both fixed effects and random effects methods were used to generate estimates for all outcomes. Tests of statistical homogeneity were performed to determine which estimate was most appropriate for each outcome.
Population Studied: Inclusion criteria included publication in English and enrollment of children aged 2–17 years with a clinical diagnosis of asthma. Studies conducted outside the United States were excluded, because health care utilization may vary across nations with different types of health care systems.
Principle Findings: Of the 174 studies identified and screened, 34 (20%) met the inclusion criteria. Twenty-six compared asthma education to usual care and eight compared different types of educational interventions. Among studies that compared asthma education to usual care, asthma education was associated with statistically significant decreases in mean hospitalizations (SMD = -0.35, 95% CI = -0.43, -0.08), mean ED visits (SMD = -0.17, 95% CI = -0.31, -0.03), and odds of an ED visit (OR = 0.77, 95% CI = 0.63, 0.94). Asthma education did not affect odds of hospitalization (OR = 0.87, 95% CI = 0.60, 1.27). Providing education in clinical settings or to individual children or families (as opposed to groups) was associated with fewer ED visits. Findings from studies that compare different interventions suggest that interventions that provide more sessions or supplement sessions with telephone calls produce greater reductions in ED visits and hospitalizations.
Conclusions: Providing pediatric asthma education reduces mean hospitalizations and ED visits for asthma and odds of an ED visit but not odds of hospitalization. Our findings also suggest that educational interventions that are more extensive, more individualized, and integrated with clinical services are more effective. Additional research is needed to determine the most important components of interventions and to compare the cost-effectiveness of different interventions.
Implications for Policy, Practice or Delivery: Health plans should invest in pediatric asthma education or give health professionals incentives to furnish such education. Employers should promote asthma education by requiring the health plans with which they contract to cover it. Policymakers can mandate coverage or compel health plans to report ED visits and other performance measures associated with asthma education.
Funding Source: California Health Benefits Review Program

▪ Waiting for Rehabilitation Services for Children with Physical Disabilities: Effects on Child Function & Quality of Life

Debbie Feldman, Ph.D., Bonnie Swaine, Ph.D., Julie Gosselin, Ph.D., Garbis Meshefedjian, Ph.D., Lisa Grilli, M.Sc.

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Research Objective: It is estimated that there are 5.5 million children under 14 years in Canada who have physical disabilities. For many of these children, their main treatment is rehabilitation which aims to maximize their function and enhance activity and participation. Limited accessibility to these services could potentially have a significant impact on a child's functional and health status. Lengthy waiting times for rehabilitation services for children with developmental disabilities have, in fact, been reported. The objective of this study was to explore whether longer waiting times for rehabilitation were associated with deterioration in child functional status and/or the parental perception of child's quality of life.
Study Design: The study design was a prospective cohort study of children with physical disabilities. Data on date of referral, age, gender, and diagnosis were obtained from the hospital databases. Data on date of first PT or OT appointments at the rehabilitation center, family socio-demographics, use of private supplementary services, disability severity (WeeFIM) and child quality of life (PedsQL) were obtained during parental interviews. Parents were interviewed at time of referral and at three month intervals until either admission to the rehabilitation program or end of the period of follow-up of the study. ANALYSIS: Multiple linear regression models were used to describe change in WeeFIM scores and PedsQL scores as a function of waiting time, adjusted for baseline score and receipt of any private services while waiting.
Population Studied: 124 children with physical disabilities, aged 25.7-116.7 months, referred in 2002-2004 from two tertiary care pediatric hospitals to pediatric rehabilitation centers.
Principle Findings: The mean age of our sample was 45.2 months (SD 13.3 months). In terms of level of disability, 6.5% were classified as severely disabled, 41.9% as moderately disabled, and 51.6% as mildly disabled. Half of the sample waited more than 9.1 months for admission to a rehabilitation program. Longer waiting time was significantly associated with declining total quality of life score ($p<0.03$) and psychosocial summary score ($p<0.04$), although it was not related to change in functional score.
Conclusions: Waiting for rehabilitation services among preschool aged children is negatively associated with the child's quality of life, particularly the psychocsocial aspect.
Implications for Policy, Practice or Delivery: Rehabilitation specialists should pay particular attention to psychosocial aspects of functioning and participation among children with physical problems, as these may become more problematic over time. Reducing waiting times for rehabilitation services will allow rehabilitation specialists to address psychosocial problems and eventually improve outcomes for children with physical disabilities.
Funding Source: Canadian Institutes of Health Research and Fonds de la recherche en sante du Quebec

- **EPSDT Preventive Services among Children in Arkansas' Medicaid Program**

Pamela Hull, Ph.D., M.A., Robert Levine, M.D., Dustin Brown, M.A., Van Cain, M.A., Marie Griffin, M.D., Baqar Husaini, Ph.D.

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Research Objective: State-administered Medicaid programs are federally mandated to cover free clinical preventive services for Medicaid-eligible enrollees from birth to age 21, under the umbrella of the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program. While the national target EPSDT participation rate (at least one well-child visit per year) is 80% of eligible children, Arkansas' official EPSDT participation rate has been the lowest in the U.S. for several years (around 25%). The objective of this paper was to use Medicaid enrollment and claims data to describe patterns in the utilization of EPSDT services in Arkansas in 2001 by age, gender, race/ethnicity, and geographic region.
Study Design: This study employed a longitudinal observational design. Children enrolled in Medicaid in Arkansas were observed across the 12 months of calendar year 2001, through Medicaid enrollment and claims data files. Individual-level data were used to calculate aggregate EPSDT screening rates for the overall population, for demographic subgroups, and for geographic regions to examine patterns in utilization.
Population Studied: This study used the 2001 Medicaid Analytic eXtract (MAX) files for

Arkansas obtained from Centers for Medicare and Medicaid Services (CMS), including enrollment data and claims data for all enrollees under age 21. Medicaid-eligible children enrolled in the ARKids A program were observed during 2001. EPSDT procedure billing codes were used to measure the utilization of well-child visits. EPSDT ratios were calculated based on the CMS formula (which adjusts for age and the recommended periodicity schedule) overall and by gender, race/ethnicity, and geographic region.
Principle Findings: EPSDT rates varied greatly across age groups, as expected, being highest for 1-2 year-olds, less than 1 year old, and 3-5 year-olds, with very low rates for teenagers. There was very little difference in screening rates by gender, both overall and within age groups. The total screening rate was virtually the same for all racial/ethnic groups except for Asian/Pacific Islanders, who had a higher rate. However, age-specific rates varied somewhat by race/ethnicity. Hispanic children under age 3 and Native American children under 1 year old had relatively lower screening rates. Geographic variation in EPSDT rates by county and region are presented graphically in maps.
Conclusions: Arkansas represents a valuable case study for examining factors related to EPSDT utilization, since Arkansas has the greatest need for improvement. In spite of this need, very little research has been published about EPSDT utilization patterns or general well-child care in Arkansas. By tracing patterns in EPSDT utilization, this study helps to identify areas where increased outreach efforts to families and health care providers are needed.
Implications for Policy, Practice or Delivery: The findings of this project provide useful information that Arkansas and other states can use to target strategies for increasing EPSDT rates. This study also contributes to health disparities research by identifying gaps in EPSDT service utilization across racial/ethnic groups, which can then be targeted in Medicaid EPSDT outreach efforts to facilitate access to and utilization of available services.
Funding Source: AHRQ

- **Expenditure Patterns for Medicaid Eligible Children in the Last Year of Life**

Caprice Knapp, Ph.D., Lindsay Thompson, M.D., M.S., Elizabeth Shenkman, Ph.D.

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Research Objective: About 500,000 children cope with life-limiting conditions annually, yet little is known about their health care use patterns, particularly at the end of life. Our objective was to examine the relationship between predisposing (age, race/ethnicity) and need (diagnostic) factors and health care spending patterns for inpatient, outpatient, emergency department (ED) and support services (i.e., home nursing, counseling, various therapies) among Medicaid eligible children with life-limiting conditions during the last 12 months of life. Examining health care use patterns provides valuable information about the types of services used by different groups of children that can be used to identify potential gaps or disparities in care.
Study Design: This is a retrospective study. Florida's Medicaid program provided individual-level enrollment and claims/encounter data for all children in the program from July 2002 to July 2005. Children were eligible for inclusion in the analyses if they had a diagnosis that was life-limiting and died during the observation period. Life-limiting conditions were defined as those conditions where death was expected in young adulthood. The list of conditions was developed using two strategies. First, two general pediatricians specializing in the care of children with chronic conditions at an academic health center reviewed the diagnoses of children who died. Conditions that were the cause of death but were not likely the underlying life-limiting condition were discarded, (for example, children that have sickle cell disease and later experienced a lethal stroke.) Second, these same physicians reviewed a diagnostic list of chronic conditions that has been used in other studies reported in the peer-review literature and identified those conditions that were likely to lead to death in young adulthood. A total of 825 diagnoses were identified and used to select the children along with the indicator of death found in the enrollment files. Next, the life-limiting diagnoses were grouped into one of 10 categories: Cardiovascular, Genetic, Gastrointestinal, Gestational, Injury, Immunologic, Metabolic, Neuromuscular, Neoplasm, and Other. Ordinary least squares regression was used to examine the relationship between diagnostic category, child characteristics and expenditures by type of service (inpatient, outpatient, ED, and support services). Expenditures were adjusted

and log-transformed. Finally, regression adjusted mean expenditures were compared for White and non-White children to identify differential spending in the last year of life.
Population Studied: A census of infants (0 to 1 year) and children (1 to 21 years) enrolled in the Florida Medicaid program who subsequently died between July 2002 and July 2005 and had an identified life-limiting illness (N=891).
Principle Findings: Variations in health care expenditure patterns were observed based on diagnostic categories, age, and race/ethnicity. Infants and children had similar mean annual total expenditures ($75,000). Ninety-six percent of total expenditures for infants were inpatient; they represented only 63% for children. We also found that expenditures decreased in the last six months of life for children overall: -4.8% decrease for inpatient, -14.5% for emergency department, -15.3% for support services, and -8.3% for total costs; (p =0.00 for each category). However, racial/ethnic variations were found. Inpatient expenditures decreased for White and Hispanic children in the last 6 months of life; whereas Black non-Hispanic children had a 32% increase in inpatient expenditures. While Hispanic children experienced declines in inpatient expenditures in the last six months of life, their inpatient expenditures during the last 12 months of life were double those of White non-Hispanic children. Unexpectedly, Hispanic children's expenditures for support services were ten times higher than White non-Hispanics while Black non-Hispanic children had support service expenditures that were about 80% relative to White non-Hispanic children.
Implications for Policy, Practice or Delivery: There is an increasing emphasis on implementing comprehensive palliative care programs for children with life-limiting conditions that would provide supportive therapies from the time of diagnosis to the time of death with an emphasis on care in the home and community. Children with life-limiting conditions would likely benefit from placement in these programs, which are designed to improve children's quality of life through pain and symptom management, therapy, counseling, and general support for the families. Our analyses indicate that children are receiving a substantial portion of their care in inpatient settings during the last year of life. Further investigation is needed to better understand the racial/ethnic differences in end of life expenditures, especially the variations in spending patterns among Hispanic and Black non-Hispanic children.

Funding Source: State of Florida, Children's Medical Services Division

- **Losing Insurance & Using the Emergency Dept; Critical Effect of Transition to Adulthood for Youth with Chronic Conditions**

Peter Scal, M.D., M.P.H., Robert Town, Ph.D.

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Research Objective: To evaluate the impact of losing health insurance on health care utilization, expenditures and health for young adults with chronic conditions during the transition to adulthood.
Study Design: Using longitudinal data from the Medical Expenditures Panel Survey (MEPS) we study changes in utilization and expenditures between the 1st and 2nd years of the 2 year period of observation. Simple and regression based difference-in-differences (DD) evaluate the impact of losing insurance between the 1st and 2nd years on # emergency department visits (EDV), physician visits(DRV) and total health care expenditures, comparing those who lose insurance with those retaining continuous coverage. The focus on this age group has particularly policy relevance since many young adults "age out" of insurance coverage at this time.
Population Studied: Data from panels beginning in 1997-2002 were combined to achieve a sample size of 705 young adults with chronic conditions ages 18-19 at the end of the first year of observation. Chronic condition status is identified via an ICD-9 coding system.
Principle Findings: 11.1% of the young adults with chronic conditions who were insured in Year-1 were uninsured for the full second year of observation, with differences evident by type of insurance in Year-1 (16.9 who had public and 9.0% who had private insurance lost coverage, Chi-Sq. 8.5, 1 df, $p < 0.01$). Among those who lose insurance, the mean EDV increased by 96% (0.26 to 0.51) while DRV decreased 55% (1.72 to 0.94). For those who retained coverage the EDV and DRV remained nearly stable (0.27 to 0.24, and 2.99 to 2.94, respectively). Expenditures did not change significantly for either group. In regression DD analyses adjusting for confounders and the non-normal distribution of the count data, losing insurance results in a 153% ($p<0.01$) increase in ED visits and a 44%

decrease in DR visits (p<0.01) without significant change in expenditures. Findings are robust to multiple model specifications.
Conclusions: Loss of health insurance results in decreased use of office-based physician services and a dramatic increase in ED visits. This shift in the locus of care is in stark contrast with best practices to assure high quality management of chronic conditions and likely represents a response on the part of young adults with chronic conditions to diminished access to coordinated care. While overall expenditures do not change with the loss of insurance there is a clear shift of the burden of expenditures from insurance provider to young adults with chronic conditions.
Implications for Policy, Practice or Delivery: Policy and clinical practice changes are needed to address the ability of young adults with chronic conditions receive optimal care into adulthood
Funding Source: AHRQ

Children's Healthcare Quality: Measures, Medications & Drivers

Chair: Lisa Simpson, Ph.D., M.B.

Sunday, June 3 • 5:00 p.m.-6:30 p.m.

▪ The AHRQ Neonatal Quality Measures - Development and Ratings

Corinna Haberland, M.D., M.S., Sheryl Davies, M.S., Patrick Romano, M.D., M.P.H., Jeff Geppert, J.D., Olga Saynina, M.A., M.B.A., Kathryn McDonald, M.M.

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Research Objective: Critically ill neonates represent an important group within the pediatric inpatient population. We sought to develop a group of neonatal quality indicators based on administrative hospital data, and adapted from existing measures, to add to the publicly available Agency for Health Research and Quality, AHRQ, Pediatric Quality Indicator set.
Study Design: We identified previously developed quality measures, e.g., from California Perinatal Quality Care Collaborative, the Joint Commission on Accreditation of Healthcare Organizations, JCAHO, the Child Health Corporation of America, and the National Perinatal Information Center, grade III and IV intraventricular hemorrhage, IVH, retinopathy of prematurity, ROP, necrotizing enterocolitis, NEC, meconium aspiration syndrome, MAS, neonatal mortality, and nosocomial bloodstream infections, BSI. We revised definitions to facilitate use with ICD 9 CM coded administrative data and defined specific patient populations for purposes of stratification or exclusion. Measure rates were generated using the 2003 Kids Inpatient Sample. The measures were then presented to an expert panel, composed of clinicians nominated by national organizations, and were evaluated using a two stage modified Delphi process. Panelists were aided by thorough reviews of the relevant medical literature and data analyses. In the case of Neonatal Mortality, the panel was presented with two versions of the measure, one closely approximating the JCAHO measure and another with stricter inclusion and exclusion criteria.
Population Studied: Neonatal inpatients in the 2003 Kids Inpatient Sample.
Principle Findings: For those measures focusing on infants weighing 500 to 1499 grams, IVH, ROP and NEC, the rates per 1,000 eligible admissions were 50.3, 126.3, and 47.6 respectively. The rate of MAS among infants weighing 1500 grams or more was 5.02 per 1,000 eligible admissions. Neonatal Mortality, which included infants weighing 500 grams or more, had a rate of 2.72. Finally, Nosocomial BSI, which included all infants weighing 500 to 1499 grams and those weighing more under certain conditions, i.e. death, mechanical ventilation, major surgery, or acute transfer, had a rate of 311.91. Of the six presented measures, only the modified version of Neonatal Mortality and Nosocomial BSI were endorsed by the expert panel, receiving a median score of 7 or above on a 9 point scale, without significant disagreement, on one of two questions asking whether the measure would be useful for quality improvement or comparative reporting. The most common concern raised for nonendorsed measures was the uncertainty of preventability of the outcome. Another major concern was that existing ICD 9 CM codes are not specific enough to identify the events of interest, e.g., NEC with pneumatosis, high grade ROP.
Conclusions: The AHRQ versions of the measures for neonatal mortality and nosocomial BSI will allow for national surveillance and comparisons among hospitals of serious outcomes. Several widely used measures of

neonatal quality, including the current JCAHO measure of mortality, were not endorsed by a multidisciplinary expert panel, largely because existing ICD 9 CM codes are not specific enough to identify the events of interest.
Implications for Policy, Practice or Delivery: These measures have the potential to help prioritize quality improvement efforts for neonates at both local and national levels. While measures that were not endorsed by the panel would not be recommended for comparative reporting, they have potential as research tools, for identifying hospitals or areas with lower than expected rates to investigate best practices. Coding changes are needed to improve the acceptability and usefulness of other potential measures.
Funding Source: AHRQ

- Specialty Difference in Appropriate Antidepressant Dosing for Children

Michael Ong, M.D., Ph.D., Bo Liu, M.S., Eric Hamilton, M.S., Edward Jones, Ph.D., Jeb Brown, Ph.D., Susan Ettner, Ph.D.

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Research Objective: Many mentally ill children, even those with access to the mental health specialty sector, receive antidepressant drug treatment from non-specialty providers. We tested the hypothesis that children whose antidepressant drug prescriptions were obtained from a mental health specialist were more likely to receive appropriate treatment.
Study Design: Prescription episodes were generated by linking antidepressant drug prescriptions less than 30 days apart. We examined differences among episodes in which prescriptions were provided by psychiatrists only, primary care providers (PCPs) only, all other types of specialists only, and by more than one type of provider. Appropriateness was measured by dosing within recommended limits derived from Micromedex age-specific minimum and maximum recommended dose ranges, and by duration of episode of treatment. Multinomial probit models were used for dosing analyses and proportional hazards models for duration of episode analyses, with controls for age and gender. Episodes were considered inappropriate if any prescription claim in the episode had a dosage outside recommended dose ranges; tapered prescriptions were not considered inappropriate. An episode that contained any prescription of a drug without recommended dose ranges was considered "off-label".
Population Studied: We examined all antidepressant (n = 109,046) prescription drug claims made by children (n = 14,807) to a pharmaceutical benefit carve-out vendor associated with a large national managed behavioral health organization between 2000-2004. Study individuals were restricted to those who had ever used specialty mental health care during the time period to exclude confounding effects from specialty mental health care inaccessibility, and claims were restricted to 2001-2004 to minimize truncation error.
Principle Findings: Predicted probabilities that prescription episodes by psychiatrists had all doses within recommended limits was 27%, had overdoses was 2%, and had off-label use was 70%; the average episode duration was 128 days. PCPs, other specialists, and multiple provider types had significantly higher ($p < 0.05$) levels of dosing within recommended limits (predicted probability differences 3% to 16%) than psychiatrists, and significantly lower ($p < 0.05$) levels of overdoses (predicted probability differences 0.3% to 0.8%) and off-label use (predicted probability differences 14% to 32%) than psychiatrists. PCPs had the largest amount of differences. Duration of prescription episodes provided by multiple provider types was significantly longer ($p < 0.05$) than those provided by psychiatrists (hazard ratios 0.44). Duration of prescription episodes provided by PCPs and other specialists was significantly shorter ($p < 0.05$) than those provided by psychiatrists (hazard ratios 1.12 for PCPs, 1.06 for other specialists).
Conclusions: Psychiatrists are more likely to prescribe off-label and use antidepressant doses larger than recommended limits than any other group. PCPs and other specialists are more likely than psychiatrists to prescribe antidepressants for shorter duration, while antidepressant prescriptions by multiple provider types are more likely to have longer duration than those by psychiatrists.
Implications for Policy, Practice or Delivery: Psychiatrist higher use of non-recommended antidepressant medications and dosing raises concern, but further examination with clinical outcomes would determine whether these behaviors are truly inappropriate. Additional studies correlating duration and clinical differences are needed.

Funding Source: NIMH

▪ 2001-2004 National Trends in Prescription Medication Use for Children and Adolescents: Assessment of National Disparities and Quality-Related Practice Patterns

Christina Bethell, Ph.D., M.B.A., M.P.H., Debra Read, M.P.H., Tamela Stuchiner, M.A.

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Research Objective: To assess 2001-2004 national trends in disparities and quality-related patterns of care in new prescriptions and refills for children and adolescents.
Study Design: Child rates of one or more new prescriptions or refills overall and by therapeutic subclasses of medications were calculated using 2001 to 2004 Medical Expenditures Panel Survey (MEPS) data. Rates were compared and adjusted odds ratios (AOR) calculated for children and youth with special health care needs (CYSHCN), by race/ethnicity, insurance status and type, age, gender, language and other variables. Therapeutic subclass trends were evaluated for evidence of practice patterns indicative of impact by the recent quality improvement focus on medications for children with asthma, reductions in antibiotic use for children and modulation in use of psycho-therapeutic medications.
Population Studied: 41,908 children age 0 to 17 weighted to represent children nationally included in the MEPS Consolidated Household Component File in years 2001, 2002, 2003 and 2004.
Principle Findings: The proportion of children with one or more new prescriptions or refills dropped 3.4 points between 2001 and 2004 (52.6% to 49.2%), with 0 to 5 age rates increasing 4.5 points (84.3% to 88.8%). The 0 to 5 age increase was driven by a 7.6 point increase in hormones/corticosteroids (12.8% to 20.4%), a 5.7 point increase in gastrointestinal agents (5.7% to 11.4%), a 3.2 point increase in respiratory agents (55.7% to 58.9%) and a 3.3 point increase in central nervous system agents (15.5% to 18.8%) and was offset by a 6.9 point decrease in one or more new prescriptions or refills for antiinfectives (55.4% to 48.5%). The adjusted odds that CYSHCN (about 18% of children) had one or more orders or refills were 5.85 (2001) to 7.12 (2004). Rates for CYSHCN increased 4.5 points (84.3% to 88.8) while rates for non-CYSHCN dropped 4.1 points (45.8% to 41.7%). Hispanic and black children were less likely to have one or more orders or refills in 2001 thru 2004 (AOR .74 and .52 respectfully in 2004) as were lower income children and children who were uninsured (AOR .63 in 2004). Few changes in orders for psycho-therapeutic agents were observed. After adjusting for other variables, no differences were seen by whether children had private or public insurance coverage or language. Additional bivariate and multivariate findings by intensity of medication use, therapeutic subclasses and population subgroups will be presented.
Conclusions: Patterns of new prescriptions and refills between 2001 and 2004 suggest the ongoing presence of racial and socioeconomic disparities not explained by special health care needs status and insurance coverage as well as indication of a positive impact of the concurrent quality improvement focus on increasing use of medications for asthma and decreasing use of antibiotics, especially for younger children.
Implications for Policy, Practice or Delivery: National efforts advocating for improving the quality of prescription medication use may have a positive impact in a short period of time. Differential patterns of use by age, race, insurance status and income of children require further investigation regarding impact on the health of children and policy response.
Funding Source: CDC

▪ Using Health Status to Measure Quality of Care for Young Children

Embry Howell, M.S.P.H., Ph.D., Lisa Dubay, Ph.D.

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Research Objective: To identify several dimensions of child health status that can be measured in parent surveys, and to use them to evaluate the quality of child health care.
Study Design: In July 2003, a new program called Healthy Kids began in Los Angeles County, California, with a goal of extending universal health insurance for children. Healthy Kids covers uninsured (primarily Latino) children under 300% of the federal poverty level. A two-

wave telephone survey of the parents of Healthy Kids children ages one to five employed a longitudinal design, with the first wave of interviews conducted in 2005 and the follow-up wave (with the same sample) one year later. The initial sample was 1,430 parents, with 86% responding to the wave one survey and 75% responding to both waves. We developed ten measures of health status, including measures of both acute and chronic conditions. Some of the measures (eg. health status during infancy) are used as baseline (control) variables and others (perceived health status) as outcome measures in an evaluation of the quality of care under the program.
Population Studied: A sample of children ages 1 to 5 in the Los Angeles Healthy Kids program.
Principle Findings: A high proportion of Healthy Kids children had a health condition requiring health care. About one third had an acute condition that caused the parent a high level of concern, and about 10 percent had a chronic condition. A very high proportion of these young children were reported to be in fair/poor health status (much higher than national norms, including for Latino children), and over forty percent had untreated dental care needs. There was a high correlation between the parent's perception of their child's health status and the other measures of health status. For example, over 50 percent of children with an urgent condition in the past month were reported to be in fair/poor health. Children with new insurance coverage obtained health services at a significantly higher rate, allowing parents to treat conditions that were previously untreated. At wave one, after controlling for baseline health status, children who were enrolled for a year had significantly better perceived health than newly enrolled children, which is consistent with findings from a similar study in Santa Clara County. While the perceived health status of both groups of children improved between the two waves, there was no significant difference between new and established groups in the level of improvement, suggesting that gains from health insurance continued into the second year of enrollment.
Conclusions: It is possible to develop measures of health status in young children that can be used to measure the outcomes of their health care. This study illustrates how such measures can be used to measure the quality of newly available health services.
Implications for Policy, Practice or Delivery: Studies of the quality of child health care should incorporate measures of health status outcomes, as well as measures of the process of care.
Funding Source: First Five Los Angeles

- **Drivers of the Quality of Preventive and Developmental Services for Young Children? Findings from a Multi-Level, Provider and Patient-Centered Method to Assess Quality**

Christina Bethell, Ph.D., M.B.A., M.P.H., Colleen Reuland, M.P.H., Rasjad Lints, M.D., Scott Shipman, M.D., M.P.H.

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Research Objective: To evaluate the level and variations in quality of preventive and developmental services for young children according to system, office, provider and patient factors.
Study Design: The Promoting Healthy Development Survey (PHDS) was administered to children's parents and quality measures calculated on six communication-dependent aspects of developmental services; three anticipatory guidance and parental education (AGPE); two psychosocial screening measures and one regarding whether providers ask parents' about concerns regarding their child's developmental status. Child-level responses were linked with utilization and provider survey data on PHDS topics. Logistic and multi-level regression analyses included child, family and provider characteristics. Associations were assessed between provider-level quality scores and their perception of barriers to providing services, their electronic medical record (EMR) visit templates and parent education materials in the office. Four additional tests evaluated whether gaps in care may be due to provider customization of care to children with greatest risks.
Population Studied: 2173 children under age four enrolled for at least one year with a managed care organization and having at least one well-child care visit with one of 56 exclusively affiliated pediatric well-child care providers in a single metropolitan area in the last year.
Principle Findings: Children met criteria on an average of 3.08 of six quality measures (2.44 to 3.92 across providers-$p < .03$). While only 6.4% had parents reporting discussions with providers

on all PHDS AGPE topics, 39% reported either a discussion on all topics or that lack of discussion was alright (they had the information they needed). Over half were asked about concerns about their child's development (53.3%) and substance abuse and/or firearms in the home (53.1%) and 38.1% reported screening on at least one of three parent/family emotional and mental health issues. No provider scored highest or lowest on each of quality measure. Child's age, race/ethnicity, birth order, developmental status and parent's depression status were significant predictors of quality for 3 to 6 measures each. Provider age, if he/she has children, and clinical FTE status were predictive of provision of psychosocial screening. A small clustering effect by the provider children saw was observed. Small associations existed between quality and provider use of EMRs and parent education materials. No evidence emerged that providers customize care to children most at risk. Providers' agreement with potential barriers to delivery quality care, while high, was not predictive of their scores on any of the six quality measures.

Conclusions: Higher quality care is systematically provided to certain groups of children (e.g. by age, birth order, etc.). At the same time, the probability of receiving quality care varies nearly as much across children seeing the same provider as across providers even as no provider had highest or lowest performance on any aspect of quality. After inherently or explicitly controlling for eleven types of system, provider, child and family factors, significant gaps and unexplained variations exist.

Implications for Policy, Practice or Delivery: Findings suggest the presence of system level barriers requiring a broader rethinking of the models, infrastructure, workforce and resources to support quality well-child care. Parent reported data was essential to robust and actionable quality measurement.

Clinical Care for Children

Chair: David Bergman, M.D.

Monday, June 4 • 9:00 a.m.-10:30 a.m.

▪ Assessing the Role of Physicians in Child Health Disparities

Lauren Smith, M.D., M.P.H., Carol Simon, Ph.D., William White, Ph.D., Andrew Johnson, M.A., Alyssa Pozniak, Ph.D., Lois Olinger, M.C.P.

Presented By: Lauren Smith, M.D., M.P.H., Associate Professor of Pediatrics, Pediatrics, Boston University School of Medicine, 91 E. Concord Street, 4th Floor, Boston, MA 02118, Phone: (617) 414-7911, Email: lauren.smith@bmc.org

Research Objective: To examine racial variation in clinical pediatric decision making for 2 conditions with a high degree of clinical discretion, asthma and depression, and to explore the extent to which pediatric racial and ethnic disparities are affected by the characteristics of providers, the nature of physician practices, and the managed care environment.

Study Design: Despite major advances in the clinical capability to prevent and treat many of the most important threats to child health, a growing literature has documented substantial racial/ethnic disparities in utilization and quality of health services and child health outcomes. Research has suggested that clinician discretion in decision-making may play a role in the significant racial/ethnic variation in care. Managed care, through use of service coordination, clinical guidelines and gate-keeping arrangements is hypothesized to reduce disparities in access to primary care, but financial incentives and controls may increase disparities in access to specialty and diagnostic services. The studied involves a mixed-mode survey linking physician prescribing and management behavior to characteristics of the physician, his/her practice setting and the managed care environment. Survey domains include: physician demographics and income, practice revenue, financial condition, use of health information technology, patient population characteristics, such as proportion who are minority or have limited English proficiency, and physician perceptions of barriers to medication adherence. Pediatric providers are presented with 2 pediatric clinical vignettes in which the race/ethnicity of the child is randomly varied among the sample. Multivariate weighted regression and logistic regressions were used to analyze reported physician behavior and factors associated with diagnosis and management. Data are weighted to account for sampling design.

Population Studied: A random sample of 1200 primary care physicians, including pediatric providers in 5 states (California, Georgia, Illinois, Pennsylvania and Texas). The sample was derived from the American Medical Association

Physician Masterfile and included oversampling of pediatric and minority physicians.
Principle Findings: Preliminary findings show differences in reported prescribing and management behavior when the race/ethnicity of the patient was varied. Practice setting and resources were related to prescribing patterns, as were physician perception of the likelihood of adherence and patient population characteristics. Further analyses will estimate the relative contribution of each of these factors to decision-making patterns and will compare the pattern of influences for pediatric vs. adult providers and for minority vs. non-minority providers.
Conclusions: The findings suggest that there is racial/ethnic variation in prescribed care for 2 common pediatric health conditions, asthma and depression and that practice setting and patient population characteristics are associated with this variation.
Implications for Policy, Practice or Delivery: This research contributes to a better understanding of the physician and practice-level factors that are associated with disparities in pediatric clinical decision making and suggests that efforts to reduce racial/ethnic disparities in child health care should take into account the contribution of these factions, while organizing systems of care to buffer children from these effects.
Funding Source: AHRQ, The California Endowment, The Commonwealth Fund

- Effects of Expanding Preventive Dental Care in Medical Offices for Young Children Covered by Medicaid

Sally Stearns, Ph.D., R. Gary Rozier, D.D.S., M.P.H., Jeongyoung Park, M.P.H., Bhavna T. Pahel, B.D.S., M.P.H., Rocio Quinonez, D.M.D., M.S., M.P.H.

Presented By: Sally Stearns, Ph.D., Associate Professor, Health Policy and Administration, University of North Carolina at Chapel Hill, CB #7411, Chapel Hill, NC 27599-7411, Phone: (919) 843-2590, Fax: (919) 966-6961, Email: sstearns@unc.edu

Research Objective: Dental decay is the most common preventable chronic disease encountered among children of preschool age in the U.S. Clinical guidelines recommend that primary care providers take an active role in preventive oral health, and physicians historically have provided a dental assessment and oral health counseling of parents during well-child visits. In January 2000, North Carolina initiated a comprehensive preventive dental program for Medicaid-enrolled children birth through 35 months of age (Into the Mouths of Babes, or IMB) offered in medical offices by providers who completed continuing medical education related to these services. This study assesses the effects of the IMB program, which included the application of a fluoride varnish to children's teeth in addition to screening, risk assessments and counseling, on access to preventive dental care and subsequent use of restorative dental treatments.
Study Design: The observational longitudinal analysis uses child-month indicators of IMB visits in medical offices and dental visits (preventive and restorative) in dental offices. Because the program was implemented gradually throughout the state over several years, a difference-in-differences regression approach is used to analyze the effect of the IMB program on access to dental care. Regression analyses also are used to compare subgroups of children receiving four or more of a possible six IMB visits with children receiving no IMB visits to determine whether the IMB program results in reduced use of caries-related treatment.
Population Studied: The analysis uses Medicaid claims and enrollment data from the NC Division of Medical Assistance for all children from 6 through 35 months of age who were enrolled in Medicaid from January 2000 through June 2003.
Principle Findings: The IMB program led to a substantial overall increase in access to preventive dental care without reducing preventive care by dentists. The program increased visits to dentists for treatment of existing disease. Despite the increased referral to treat identified disease, the program reduced the need for dental treatment by 3 years of age among children with four or more IMB visits.
Conclusions: Analysis of the program during the implementation phase means the high magnitude of referrals for existing disease could decrease over time. The IMB program increased access to preventive dental care, improved dental health due to timely treatment of existing disease, and reduced total restorative treatment with likely associated improvements in dental health. Reductions in rates of dental restorations by 3 years of age suggest that the need for dental restorations may also be reduced beyond that age.
Implications for Policy, Practice or Delivery: Dentists are in short supply in many areas, and access to preventive dental care historically has

been very poor for young Medicaid-eligible children. Expanding access to preventive dental care in medical offices does not decrease use of dentists for preventive care, improves dental health through referrals to dentists, and appears to result in long-run decreases in need for restorative dental services. Because a number of visits are required to obtain the full preventive benefits, the cost-effectiveness of the program ultimately rests on reductions in dental restorations beyond age 3.
Funding Source: National Institute for Dental and Craniofacial Research

- **Recurrent Urinary Tract Infections: Risk Factors and Effectiveness of Prophylaxis in a Primary Care Cohort**

Patrick Conway, M.D., Brandon Henry, B.S., Robert Grundmeier, M.D., M.S., Theoklis Zaoutis, M.D., M.S.C.E., Ron Keren, M.D., M.S.C.E., Avital Cnaan, Ph.D.

Presented By: Patrick Conway, M.D., Robert Wood Johnson Clinical Scholar and Instructor, RWJ Clinical Scholars and General Pediatrics, University of Pennsylvania, 423 Guardian Drive, Blockley 1303A, Philadelphia, PA 19104-6021, Phone: (215) 573-2573, Fax: (215) 573-2742, Email: pconway2@mail.med.upenn.edu

Research Objective: In a primary care cohort, no published studies have evaluated the risk factors for recurrent UTI and the risks and benefits of prophylactic antibiotics. Therefore, we aimed: 1. To identify factors associated with recurrent UTI in a primary care pediatric cohort; 2. To determine the effectiveness of prophylactic antibiotics for preventing recurrent UTI and their effect on the development of resistant infections.
Study Design: In a primary care network of 27 pediatric practices sharing a common electronic health record, we identified all children younger than 6 years who had an initial UTI between 7/1/2001 and 5/31/2006 and tracked them until they developed a recurrent UTI or their last clinic visit. We used survival analysis to identify risk factors for recurrent UTI, including age at first UTI, gender, race, presence of vesicoureteral reflux (VUR), and prophylactic antibiotic exposure (defined as a time varying covariate). In a nested case-control study, we utilized logistic regression to determine risk factors for resistant vs. pan-sensitive bacteria as the cause of recurrent UTI.
Population Studied: Identified children with first UTI from all children younger than 6 years of age seen within primary care pediatric network.
Principle Findings: During the study period, 81,997 children had a clinic visit within network, 612 children had a first UTI, and 82 children had a recurrent UTI. Mean observation time was 408 days. The incidence rate for recurrent UTI was 0.12/person-year. In multivariate survival analysis, only white race (HR 2.0, 95% CI 1.2-3.3) and age over 2 years (HR 2.0, 1.2-3.3) were associated with increased risk of recurrent UTI. Prophylactic antibiotics, VUR, and gender were not significantly associated with risk of recurrent UTI. Among recurrent UTIs, antibiotic resistance was associated with prophylactic antibiotic exposure (OR 7.1, 1.5-33.3), non-white race (OR 4.6, 1.5-13.9), and age less than 2 years (OR 3.9, 1.3-11.8).
Conclusions: The rate of recurrent UTIs from this primary care population was significantly lower than reported in previous studies that were typically small clinical trials or from referral populations (12% per year vs. 21-69% recurrence within 6-12 months). VUR, for which prophylaxis is currently recommended, was not associated with increased risk of recurrent infection. Prophylactic antibiotics did not protect against recurrent UTI and were associated with increased risk of resistant infections.
Implications for Policy, Practice or Delivery: This further calls into question the AAP guidelines for prophylaxis following first UTI. Since it is unclear that prophylaxis is beneficial and may pose a risk of resistant infections, this information should be shared with families and joint decisions on prophylaxis made with physicians.
Funding Source: RWJF

- **Impact of Emergency Department Asthma Management Strategies on Return Visits in Children: A Population-based Study**

Astrid Guttmann, M.D.C.M., M.Sc., Brandon Zagorski, M.Sc., Asma Razzaq, M.P.H., Geoff Anderson, M.D., Ph.D.

Presented By: Astrid Guttmann, M.D.C.M., M.Sc., Scientist, Institute for Clinical Evaluative Sciences, 2075 Bayview Ave, G1 06, Toronto, ON, M4N 3M5, Canada, Phone: (416) 480-4055 ext 3783, Fax: (416) 480-6048, Email: astrid.guttmann@ices.on.ca

Research Objective: To describe the characteristics of children treated in Emergency Department (EDs) for asthma, the management strategies used in a range of ED settings and their effect on 72 hour return visit rates (a hospital quality measure).

Study Design: Population-based cohort study using both comprehensive administrative heath and survey data from all 152 EDs in Ontario, Canada.
Population Studied: All children ages 2 - 17 years who had a visit to the ED for asthma during April 2003 to March 2005.
Principle Findings: 32,996 children (over 9% of children with asthma in Ontario) had at least one visit to an ED for care of asthma and the majority of visits (68.5%) were high acuity. The vast majority (148/152, 97%) of EDs reported using at least one asthma management strategy and 74% used three or more. Less than half reported routine use of peak flow monitoring. The overall return visit rate was 5.6%. Logistic regression models that accounted for the clustering of patients in EDs and controlled for patient and ED characteristics indicated that standard, pre-printed order sheets (OR 0.68, 95% CI 0.55 to 0.88) and access to a pediatrician for consultation in the ED (OR 0.64, 95% CI, 0.52 to 0.79) were the only two individual strategies that had a significant impact on return visits. The 11 (17%) EDs that used both of these strategies had return visits rates of 4.4% compared to 6.9% in the 95 (63%) that used neither.
Conclusions: EDs use a range of strategies to manage asthma in children but some are more effective in improving care. Pre-printed order sheets and access to pediatric consultations are associated with important reductions in return visit rates.
Implications for Policy, Practice or Delivery: Imbedding guideline care into practice, as with standard order sheets, improves patient and ED outcomes. This intervention is highly feasible and should be undertaken by EDs to ensure high quality asthma care.
Funding Source: Ontario Hospital Report

- **Variations and Deviations in the Use of Tympanostomy Tubes for Children with Otitis Media**

Salomeh Keyhani, M.D., M.P.H., Lawrence C. Kleinman, M.D., M.P.H., Michael Rothschild, M.D., Rebecca Anderson, M.P.H., Melissa Simon, B.S., Mark Chassin, M.D., M.P.P., M.P.H.

Presented By: Salomeh Keyhani, M.D., M.P.H., Assistant Professor, Health Policy, Mount Sinai School of Medicine, 1 Gustave L Levy Place, New York, NY 10029, Phone: (212) 659-9563, Email: salomeh.keyhani@moutnsinai.org

Research Objective: To describe variations in practice among children who received tympanostomy tubes in the New York Metropolitan area in 2002, and to contrast practice with the 1994 and 2004 clinical practice guidelines (developed by the American Academies of Pediatrics, Family Medicine, and Otolaryngology—Head and Neck Surgery) that generally recommend delaying the insertion of tympanostomy tubes until bilateral otitis media with effusion (OME) persists for 4 months or longer with hearing loss or other signs and symptoms.
Study Design: Retrospective cohort study
Population Studied: Clinical analysis was performed for 682 children (under 18) for whom it was possible to abstract data for the year preceding surgery from the medical records of the surgeon, the hospital, and the primary care provider. The sample represents 65% of all children who received tubes in any of five New York City area hospitals (2 academic medical centers, one tertiary care teaching hospital, one private not for profit community hospital, and one teaching public hospital); social and demographic of variables were similar for those children not included in the sample.
Principle Findings: Mean age was 3.8 years, 57% were male and 74% had private insurance. More than 25% had received tubes previously. Common reason for surgery included OME, (60.4%), recurrent acute otitis media (RAOM, 20.6%), and Eustachian tube dysfunction (10.6%). Children with RAOM averaged 3.1±0.2 episodes (median=3) in the previous year; those with OME averaged 29±1.7 (median= 16, standard deviation = 35.3, coefficient of variation=120%) consecutive days of bilateral effusion documented immediately prior to surgery. 75% of children with OME had less than 42 consecutive days of bilateral effusion, with 5% having bilateral effusions for at least 120 days. 78% of children with OME had documented hearing loss. Overall, 17.3% of all children were identified with a condition that may put them "at risk" for developmental delays that exempted them from the guidelines' general recommendation.
Conclusions: The clinical characteristics of children who received tympanostomy tubes in this sample varied widely. Many had very little ear disease at the time of surgery. The variations were not accounted for by reported speech or hearing problems, reported disruptions of family life, insurance status, ethnicity, hospital, or other commonly considered clinical or demographic variables. A substantial amount of practice

departs from expert recommendations. These findings suggest significant over utilization of tympanostomy tube insertions in children persists despite the publication of guidelines by professional societies.
Implications for Policy, Practice or Delivery: Clinicians and parents should consider these findings when caring for children with otitis media. The extent of variation in treating this familiar condition with limited treatment options suggests both the importance and difficulty of managing common clinical practice to comport with accepted guidelines, even one that was developed by three leading clinical Academies.
Funding Source: AHRQ

Comparative Effectiveness & Technology Assessment

Comparative Effectiveness Research: The Increasing Elegance of "Coke vs. Pepsi" Studies

Chair: Tanisha Carino, Ph.D.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

▪ Improving HIV Screening with Nurse Rapid Testing and Streamlined Counseling

Henry Anaya, Ph.D., Steven M. Asch, M.D., M.P.H., Tuyen Hoang, Ph.D., Matthew Goetz, M.D., Allen Gifford, M.D., Candice Bowman, Ph.D.

Presented By: Henry Anaya, Ph.D., Research Scientist, U.S. Department of Veteran's Affairs, 11301 Wilshire Boulevard, 111G, Los Angeles, CA 90073, Phone: (310) 478-3711, Email: henry.anaya@va.gov

Research Objective: Testing for HIV has been shown to be cost effective in unselected general medical populations, yet rates of testing among those at risk remain far below optimal, even among those with regular primary care. The specific aims of this project are: oTo determine whether nurse-based referral for traditional HIV testing and counseling will improve screening rates compared to current testing procedures. oTo determine whether nurse-based rapid testing with streamlined counseling improves screening rates more than nurse-based referral for traditional testing and counseling alone.

Study Design: A parallel-group, controlled study was conducted in the primary/urgent care clinics of the West Los Angeles VA. Eligibility was based on same-day appointment; age (18-65); no prior HIV test in past year; unknown HIV status. One hundred sixty six patients were randomized to one of three screening models: Model A: patients urged to discuss testing with their physician (control). Model B: nurses offered traditional counseling/testing. Model C; nurses offered streamlined counseling/rapid testing. Interventions were performed by nurses in addition to their regular clinic duties.
Population Studied: honorably discharged veterans between the ages of 18-65 with unknown HIV status
Principle Findings: Model A: 22 patients (40.7%) had test ordered; Model B: 48 (84.2%) had test ordered; Model C: 51 (92.7%) had test ordered. Of 22 patients in Model A with a test order, 9 (40.9%) received results; of 48 patients in Model B with test order, 25 (52.1%) received results; of 51 patients in Model C with test order, 46 (90.2%) received results.
Conclusions: Results show that both interventional models will likely result in higher screening rates than traditional HIV testing models in primary care.
Implications for Policy, Practice or Delivery: HIV rapid testing has been shown to be an effective means by which to convey results to patients, which is especially salient given the approximately 300,000 persons in the US alone who are unaware of their HIV-positive status. Increased rates of testing could lead to earlier identification of disease, increased treatment and reduced morbidity and mortality. Reduced intensity of counseling might free staff resources. As the VA is the largest HIV care provider in the US, it would be beneficial for policymakers to use this project and associated findings as a model when considering implementing rapid testing on a regular basis.
Funding Source: VA

▪ Constructive Technology Assessment of Microarray Testing in Breast Cancer Treatment

Willem Van Harten, M.D., Ph.D., Jolien M. Bueno-de-Mesquita, M.D., Valesca P. Rètel, M.Sc., Kim Karsenberg, M.Sc., Marjan M. Hummel, Ph.D.

Presented By: Willem Van Harten, M.D., Ph.D., Member Ex. Board of Directors and Prof. Quality Management of Health Care Technology, Organisation & Management, School of

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Research Objective: Performing technology assessment in an early stage of the controlled implementation of the prognostic 70-gene signature, a genomic test using microrrays, in the treatment of node-negative breast cancer patients.
Study Design: As the technology was in its earliest stage of clinical implementation the Constructive Technology Assessment approach was chosen. This method is related to theories on Technology Dynamics and was developed in the field of Public Policy. All aspects as defined by the Institute of Medicine as well as technology related issues, such as juridical aspects, were covered. Method used: -Documentation analysis of internal process dynamics of the organisations before and after introduction. -Multidisciplinary team interviews before and after introduction. -Patient consultation recordings and patient questionnaires. -Descriptive registration and comparison of prognosis assessment using traditional clinical. guidelines and the genomic 70-gene microarray test. - Scenario drafting and revision.
Population Studied: In this implementation study, 812 eligible patients from 16 Dutch hospitals participated and 425 70-gene microarray test were performed.
Principle Findings: - Introducing and implementing this new technology in clinical practice took on average about 6 months per participating hospital.- Especially pathologists had to change their working routine as they were requested to process the tissue directly after surgical removal of the tissue.- Health care professionals had to take more than average time than before to properly explain to the patient the pro's and con's of this test.- In 30% of the cases the patients' prognosis based on clinical guidelines was discordant with the prognosis based on the 70-gene microarray test. - In general, patients were accepting the specialists' treatment advice. This was even the case if the patients' prognoses based on clinical guidelines was discordant with genomic prognosis based on the 70-gene microarray test. - Scenario development proved feasible and provided options in the early stage that were considered unlikely by professionals, but nevertheless became reality.
Conclusions: - The implementation of new genomic tests like the 70-gene microarray test in node-negative breast cancer patients is a complex process. - Constructed Technology Assessment is a promising method to analyse technologies in their early stage of development and implementation that are introduced in a controlled way. - Health care professionals have to anticipate to 30% discordance between prognosis assessed by traditional clinical guidelines versus genomic testing.
Implications for Policy, Practice or Delivery: - The controlled introduction of promising genomic tests is feasible. - Constructive Technology Assessment is a promising broad assessment method for the implementation of new technologies in an early stage of their development. - Based on the experiences of this controlled implementation trial, a large European randomised trial (MINDACT-trial) was designed and will start in January 2007.

- **Looking for Modifiers of Treatment Effects in the General Medical Literature: Room for Improvement**

Nicole Bloser, M.H.A., M.P.H., Naihua Duan, Ph.D., Diana Liao, M.P.H., Elizabeth Yakes, M.S., Kiavash Nikkhou, B.S., Richard L. Kravitz, M.D., M.S.P.H.

Presented By: Nicole Bloser, M.H.A., M.P.H., Graduate Student Researcher, University of California, Davis, 2103 Stockton Boulevard, Grange Building, Suite 2224, Sacramento, CA 95817, Phone: (916) 734-2399, Fax: (916) 734-8731, Email: nrbloser@ucdavis.edu

Research Objective: Randomized controlled trials (RCTs) generate average treatment effects, but patients want to know which treatments will work for them. Individualizing care for the complex patient requires knowledge of treatment impact in similar individuals or subgroups, which in turn depends on identifying moderators of treatment effects (MTEs). In an effort to avoid the appearance of "data dredging," clinical investigators may be missing opportunities to explore MTEs, thus slowing accrual of evidence for treating "patients like me." This study was undertaken to determine current practice in evaluating MTEs and to elucidate trends.
Study Design: We examined a probability sample of 227 RCTs. Articles were independently reviewed and coded by 2 investigators with adjudication by a third. Studies were classified as having: a) MTE analysis utilizing a formal test for heterogeneity or interaction; b) subgroup

analysis only, involving no formal test for heterogeneity or interaction, or c) no subgroup or MTE analysis. Chi-square tests and multiple logistic regression analysis were used to identify study characteristics predictive of MTE reporting.
Population Studied: 227 RCTs published in 5 journals (Ann Intern Med, BMJ, JAMA, Lancet, and NEJM) during odd numbered months of 1994, 1999, and 2004.
Principle Findings: Of the 227 RCTs, 101 (44%) performed no subgroup or MTE analysis, 62 (27%) examined subgroups but without MTE analysis, and 64 (28%) performed MTE analysis. MTE analysis gained currency with time (18%, 29%, and 34% of studies in 1994, 1999, and 2004, respectively). Among the 64 studies reporting MTE analysis, major covariates examined included age (30%), sex (28%), study site or center (17%), and race/ethnicity (8%). Using multiple logistic regression to examine study year, journal, clinical condition, and sample size, only sample size was a significant predictor of whether MTE analysis was performed; comparing the top quintile of studies (median n=1649) to the bottom quintile (median n=36), the adjusted odds ratio was 4.9 (95% CI 1.6-15.1, p=.0045). However, MTE analysis was performed less than half the time (49%) even in the top quintile.
Conclusions: Missed opportunities for MTE analysis abound. In the face of broad NIH mandates for inclusion of subjects by race/ethnicity, the low proportion of studies testing race/ethnicity as a treatment effect moderator is both puzzling and disappointing.
Implications for Policy, Practice or Delivery: Accepting Kraemer et al.´s argument (JAMA, 2006) that exploratory moderator analysis is critical for designing appropriate future confirmatory studies, standards are needed to assure that exploratory moderator analysis and reporting become rigorous and routine. Such standards are essential for developing practice guidelines that are appropriate to the needs of the complex patient.
Funding Source: Pfizer Inc.

- **Decision Makers' Attitudes Toward Cost Effectiveness Analysis**

Shoshanna Sofaer, Dr.P.H., Stirling Bryan, Ph.D., Taryn Siegelberg, M.P.A.

Presented By: Shoshanna Sofaer, Dr.P.H., Robert P. Luciano Professor of Health Care Policy, School of Public Affairs, Baruch College, One Bernard Baruch Way, Box D901, New York, NY 10011, Phone: (646) 660-6815, Email: shoshanna_sofaer@baruch.cuny.edu

Research Objective: While cost-effectiveness analysis (CEA) is part of the policymaker's toolkit in making insurance coverage decisions in many western nations, it is largely unused in the US. We have little empirical knowledge about what gives decision-makers pause about using CEA. Our research sought to understand receptiveness to CEA among those who influence coverage decisions, and how institutional constraints, individual values and methodological concerns shape decision-maker views.
Study Design: This exploratory study collected data through six structured workshops in California. During these 3-4 hour workshops/focus groups, participants were asked to take on the role of "social decision-maker" addressing issues of concern to the Medicare program. CEA methods were explained; ethical/normative issues inherent in CEA were discussed; and participants prioritized 14 treatments for coverage in response to information from published CEA studies. At the end of each session, participants removed their social decision maker "hat" and discussed, from an organizational perspective, advantages and barriers to CEA. A pre-group survey addressed knowledge and attitudes to CEA and gave respondents an opportunity to prioritize the 14 treatments based on effectiveness information alone. A post-group survey re-asked knowledge and attitude questions adding other questions about the workshop and CEA. Survey data were analyzed descriptively at both points in time. Changes over time were assessed statistically, as were changes in priorities following the presentation of cost-effectiveness data. All sessions were audio-taped, transcribed, and coded and analyzed using NVivo software.
Population Studied: Participants included senior leaders (both clinical and non-clinical) from different types of health insurance plans, private and public sector health care purchasers, disease management organizations, and state regulators of managed care plans.
Principle Findings: In the post-workshop survey, over 90% of participants indicated that CEA should be used as an input into coverage decisions for Medicare and over 70% said it should be used in private insurance plans. Participants also identified reasons to avoid using CEA, including: fears of negative consumer perceptions; litigation risks; inadequate in-house expertise; worries about biased studies; concerns about ethical issues;

and a preference for reducing costs by reducing demand. Many noted that no single entity, particularly in the private sector, could "go it alone" in explicitly using CEA. Finally, when provided with cost-effectiveness information on a variety of condition-treatment pairs, participants changed their priorities to fund treatments with more favorable cost effectiveness ratios, and exclude treatments with higher ratios.

Conclusions: Senior California decision-makers believe that CEA is an effective and promising tool to assist cost containment.. Some are not confident in their ability to acquire, assess and apply high quality CEA studies. Cost effectiveness data was influential in changing hypothetical decisions about coverage in the Medicare program.

Implications for Policy, Practice or Delivery: There is a need to identify and motivate a visible policy leader in health care, such as the Medicare program, to move in the direction of making CEA studies an input into coverage decisions. Better promotion of the availability of high-quality CEA studies and more accessible information about the elements of such studies, is needed.

Funding Source: California Health Care Foundation

- **Using Observational Data to Extend the Results of a Randomized Controlled Trial: An Application to the HOPE Trial**

Paul Hebert, Ph.D., Mary Ann McLaughlin, M.D., M.P.H., Jodi M Casabianca, M.S., Anu Lala, M.D.

Presented By: Paul Hebert, Ph.D., Assistant Professor, Health Policy, Department of Health Policy, Mount Sinai School of Medicine, One Gustave L Levy Place, Box 1077, New York, NY 10029-6574, Phone: (212) 659-9567, Fax: (212) 423-2998, Email: paul.hebert@mssm.edu

Research Objective: The purpose of this study was to explore the use of observational data to extend the results of a randomized controlled trial (RCT). We considered the Heart Outcomes PrEvention (HOPE) RCT, which demonstrated broad clinical benefits of ramipril, an angiotensin converting enzyme inhibitor (ACEI), for patients with risk factors for cardiovascular disease.

Study Design: We conducted a retrospective statistical analysis. We first attempted to recreate the findings of the HOPE RCT using observational data and instrumental variable (IV) models, to assess whether IV analyses can address the selection bias inherent to observational data. With the success of this analysis, we then applied these same methods to a sample of non-white patients. Non-white patients accounted for <5% of HOPE trial participants. We also assessed whether other ACEIs showed clinical benefits similar to ramipril. Data came from administrative databases for dually-eligible Medicare and Medicaid beneficiaries from California from 1996-99—the period during which HOPE was conducted. Medicaid claims for prescriptions identified patients taking antihypertensives in 1997. Diagnosis codes on Medicaid/Medicare claims identified risk factors in 1996. The outcome was the composite endpoint of all-cause mortality or hospitalization for stroke or myocardial infarction (similar to HOPE) over the 1997-99 period. Instrumental variables were managed care market penetration in the beneficiary's county of residence, and the ratio of ramipril to other ACEI prescriptions filled in a beneficiary's ZIP code in 1996. We estimated linear probability models (LPMs) and IV LPMs with instruments for ramipril use, both with robust standard errors. To assess whether similar clinical benefits could be attributed to other ACEIs, we identified patients who were prescribed other ACEIs (benezapril, captopril, and enalapril) in 1997 and estimated multivariate Cox models of the time to the composite endpoint as a function of the ACEI prescribed.

Population Studied: Dually-eligible Medicaid/Medicare patients from California being treated with an antihypertensive.

Principle Findings: We identified 108,209 patients who met the HOPE inclusion criteria, of whom 4,789 took ramipril in 1997. LPM on 56,549 White patients suggest a risk ratio (RR) of 0.842 ($p<0.001$) for ramipril use, which compared favorably to RR=0.75 in HOPE. IV LPMs models yielded RR=0.463 ($p=0.032$). Applying these same models to 51,660 non-White beneficiaries generated RRs of 0.992 ($p=0.869$) and 1.535 ($p=0.127$) for ramipril use from LPMs and IV LPMs, respectively.
In Cox models for patients taking any ACEI in 1997, patients taking benezapril (n=2,839; hazard ratio=1.037, $p=0.624$) had similar risks of the composite endpoint compared to patients taking ramipril, while patients taking enalapril (n=4408; hr=1.17, $p=0.018$) or captopril (n=1469; hr=1.3, $p<0.001$) faired worse.

Conclusions: IV models applied to observational data matched the results of the HOPE RCT. The same models suggested no benefit of ramipril for non-white beneficiaries.

Ramipril and benezepril appeared superior to enalapril and captopril.
Implications for Policy, Practice or Delivery: These results can help guide prescribing practices and have implications for proposed formulary policies that restrict access to benezapril and ramipril. These data also provide some support to the hypothesis of racial differences in cardiac drug effectiveness.
Funding Source: NIH National Institutes of Diabetes Digestive and Kidney Disease (NIDDK)

Consumer Decision-Making

Consumer Decision-Making in Clinical Trials, Screening & Treatment

Chair: Shoshanna Sofaer, Dr.P.H., M.P.H.

Sunday, June 3 • 5:00 p.m.-6:30 p.m.

▪ Understanding Patient Expectations in Early-Phase Clinical Oncology Trials

Damon M. Seils, M.A., Janice P. Tzeng, B.S.P.H., Kate L. Compton, B.A., Daniel P. Sulmasy, OFM, MD, PhD, Alan B. Astrow, M.D., Neal J. Meropol, M.D.

Presented By: Damon M. Seils, M.A., Senior Research Analyst, Duke Clinical Research Institute, Duke University, PO Box 17969, Durham, NC 27715, Phone: (919) 668-8582, Fax: (919) 668-7124, Email: damon.seils@duke.edu

Research Objective: Participants in early-phase clinical trials have reported high expectations of benefit from their participation. There is concern that participants misunderstand the trials to which they have consented. Such concerns are based on assumptions about what patients mean when they respond to questions about likelihood of benefit. In this study, we explored some of these assumptions.
Study Design: Participants were randomized to 1 of 3 interview protocols corresponding to 3 "target questions" about likelihood of benefit: frequency-type ("Out of 100 patients who participate in this study, how many do you expect will have their cancer controlled as a result of the experimental therapy?"); belief-type ("How confident are you that the experimental therapy will control your cancer?"); and vague ("What is the chance that the experimental therapy will control cancer?"). In semistructured interviews, we queried participants about how they understood and answered the target question. Each participant then answered and discussed one of the other target questions.
Population Studied: Participants were 27 women and 18 men enrolled in phase 1 or 2 oncology trials at 2 large academic medical centers in the United States.
Principle Findings: Participants tended to provide higher expectations in response to the belief-type question (median, 80) than in response to the frequency-type or vague-type questions (medians, 50) (P=.02). Only 7 (16%) participants said their answers were based on what they were told during the consent process. The most common justifications for responses involved positive attitude (n=27 [60%]) and references to physical health (n=23 [51%]). References to positive attitude were most common among participants with high (>70%) expectations of benefit (n=11 [85%]) and least common among those with low (<50%) expectations of benefit (n=3 [27%]) (P=.04).
Conclusions: We identified two important factors that should be considered when determining whether high expectations of benefit are signs of misunderstanding. First, participants report different expectations of benefit depending on how the question is asked. When asked about the chance that they will benefit personally, participants gave responses that were about 30 percentile points higher than when they were asked about the relative frequency of benefit in a population of patients. Second, the justifications participants give for their answers suggest that many participants use their responses to express hope rather than to describe their understanding of the clinical trial. Only 16% of the participants based their answers on what they were told during the consent process. Thus, there might be a significant mismatch between the goal of the interviewer (ie, to query understanding) and the goal of the participant (eg, to cultivate and express a positive attitude in the hope that it will improve their outcomes). This makes it challenging to assess patient understanding in early-phase oncology trials.
Implications for Policy, Practice or Delivery: Based on our findings, researchers should consider disclosing risks and benefits in terms of relative frequency rather than individual terms (eg, "The chance that you will benefit is..."). Researchers and clinicians involved in the consent process should also consider providing patients with an opportunity to express confidence in their particular outcome before querying them regarding their understanding about the trial's potential benefits.

Funding Source: NCI

- **Decisional Conflict among Patients Who Accept or Decline Participation in Phase I Cancer Clinical Trials**

Damon Seils, M.A., Kevin P Weinfurt, Ph.D., Damon M Seils, M.A., Caroline B Burnett, R.N., Sc.D., Kevin A Schulman, M.D., Neal J Meropol, M.D.

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Research Objective: There is concern that patients who agree to participate in phase I cancer clinical trials may not be making optimal decisions, perhaps due to insufficient understanding of potential benefits and risks, poorly formed personal values about benefits and risks, or vulnerability to undue influence by others. Our objective was to compare decisional conflict among patients who accepted or declined participation in phase I cancer clinical trials.
Study Design: Participants completed a 121-item questionnaire in person or by telephone that included the 16-item Decisional Conflict Scale (DCS), which assesses self-reported understanding of options and outcomes, personal values about possible outcomes, perceptions of the influence of others, satisfaction, and other issues concerning the decision-making process. Response categories are measured on a 5-point scale from 1=strongly agree to 5=strongly disagree. Items are averaged into an overall score where 1 indicates low decisional conflict and 5 indicates high decisional conflict. In addition to the overall score, 5 subscales include: Informed, Values Clarity, Support, Uncertainty, and Effective Decision. We used standardized effect sizes (d) to compare DCS scores of patients who agreed to participate in a phase I trial with those who declined. Effect sizes around 0.2, 0.5, and 0.8 are considered small, medium, and large, respectively.
Population Studied: Participants were adults with advanced cancer from 4 academic medical centers in the United States who had been offered an opportunity to enroll in a phase I trial and had made a decision about whether to enroll but had not yet started therapy.
Principle Findings: Of 328 respondents offered participation in phase I cancer clinical trials, 260 (79%) accepted participation and 68 (21%) declined. There were no observed differences in demographic or clinical characteristics between accepters and decliners. Accepters had lower decisional conflict than decliners overall (d = 0.42; 95% confidence interval, 0.17-0.68) and on all subscales, with moderate effects on the Informed (d = 0.68; 95% CI, 0.30-1.07), Values Clarity (d = 0.43; 95% CI, 0.19-0.66), and Support (d = 0.47; 95% CI, 0.17-0.78) subscales.
Conclusions: Patients who chose to participate in a phase I trial reported less decisional conflict than patients who declined. In particular, accepters reported feeling more informed, having greater clarity about their values, and feeling less pressure from others in the decision-making process. These results may pose an ethical concern about decliners, who may report higher DCS scores because they have not had optimal decision-making support. However, a different interpretation may relate to how decliners and acceptors differ in their experience of the substantial uncertainties regarding potential outcomes (risks and benefits) from participation.
Implications for Policy, Practice or Delivery: Whether higher decisional conflict among decliners of experimental therapy reflects a problem with the informed consent process is not clear, given the multiple possible reasons for our findings. Future empirical work is needed to understand the sources of decisional conflict in patients considering treatment options characterized by great uncertainty regarding potential benefits and risks.
Funding Source: NCI

- **Assessing the Quality of Online Health Information: A Case Study of Web Search for Use of Antibiotics for Ear Infections**

Margaret L. Holland, M.S.

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Research Objective: The World Wide Web is a growing source of information for healthcare consumers and the quality of online information may significantly impact consumers' health behaviors. The increasing concerns about antibiotic overuse led to the revised recommendations from the American Academy

of Pediatrics and the American Academy of Family Physicians in May 2004 for the treatment of ear infections (acute otitis media). Specifically, a 2-3 day "watch and wait" period is now recommended for otherwise healthy children who have access to follow-up care. In this study, we assess the quality of online information in terms of the timely update of this new recommendation and identify the characteristics of the websites that are likely to provide accurate and timely information.
Study Design: We recorded the top 50 results from a Google search on November 16, 2006 using the term "ear infection." Only those websites that are actually related to ear infections were included for analysis. We reviewed the websites for appropriate information on antibiotic use (watch and wait option and a recommendation to finish the full course of any given antibiotic). For each site, we recorded the specific characteristics that are potentially associated with the quality of the information, such as the type of the site (.com, .gov, .org, etc.), the citation of information sources, the expertise of authors, the intended audience, and the information on last update. Finally, we performed the same search using Yahoo and recorded the top 60 results for comparison with the Google search hits.
Principle Findings: Out of the top 50 Google hits, 37 websites were related to ear infections and included for analysis. Within these sites, 17 (46%) included information on the watch and wait option and 11 (30%) included information on finishing the full course of antibiotics. Only 3 sites (8%) included both. Websites found to contain the most recent recommendations were those with the more recent updating dates, with the source of the recommendation cited, and sponsored by not-for-profit organizations (.org sites) or governmental agencies (.gov sites). Only 9 sites were in both the Google list and the Yahoo list, allowing for no meaningful comparison but indicating that the choice of different search engines has a significant impact to the delivery of correct information to healthcare consumers.
Conclusions: Parents who depend on the health information obtained through Web searches may not see the most recent, appropriate recommendations. Healthcare consumers need to carefully judge the quality of online information. A few characteristics of a website, such as the site sponsors, the updating date, and the information sources, might be used to assist this judgment.
Implications for Policy, Practice or Delivery: Because there is limited incentive for websites to be appropriately updated, consumers should be warned about potentially outdated materials. Providers should be prepared to educate their patients about the latest changes in recommendations and direct them to reliable online information sources. Healthcare organizations developing new recommendations should make a plan to disseminate the information promptly through both traditional approaches and online platforms such as the Web.
Funding Source: AHRQ

- Promoting Informed Decision-Making about Prostate Cancer Screening

Katherine A. Treiman, Ph.D., M.P.H., Carla Bann, Ph.D., M.A., Pam Williams-Piehota, Ph.D., M.S., Brandon Welch, M.S.

Presented By: Katherine A. Treiman, Ph.D., M.P.H., Senior Research Scientist, Health Communication Program, RTI Inernational, 203 Dale Drive, Rockville, MD 20850, Phone: (301) 762-2677, Email: Ktreiman@rti.org

Research Objective: This study was designed to measure the success of an informed decision-making (IDM) intervention on men's perceptions, preferences, and practices related to decision-making about prostate cancer screening. There is controversy about the benefits of prostate specific antigen (PSA) screening and leading guidelines indicate that men should discuss the screening decision with their doctor. Thus, consumer engagement in decision-making about PSA screening is critical so that men's decisions are well-informed and consistent with their personal preferences and values. This study addresses the following research questions: 1.How does the intervention affect: (a) perceptions about whether PSA screening is a decision; (b) preferred levels of involvement in the PSA decision; (c) actual levels of involvement; (d) concordance between actual and preferred levels of involvement; and (e) satisfaction with involvement in decision-making? 2. How do different ways of framing the PSA screening message affect outcomes? 3. What socio-demographic, psycho-social, and other factors (e.g., interaction with health care providers) predict these outcomes?
Study Design: We implemented the intervention in partnership with community-based organizations in two North Carolina metropolitan areas, with a third metropolitan

area serving as a control. In one community the intervention focused on prostate cancer only, while in the second prostate cancer information was framed in the context of broader men's health issues. Men completed a baseline survey, immediate post-intervention survey (intervention only), and 6 and 12-18 month follow-up surveys.
Population Studied: Participants were 40 to 80 years of age (mean 63 years) and had not been previously diagnosed with prostate cancer. A total of 584 men participated in the baseline study and 376 men completed the 12-18 month follow-up survey, for an overall response rate of 64%. The study sample was 35% African American and 13.5% had a high school education or less.
Principle Findings: At the 12-18 month follow-up, men in the two intervention communities had significantly higher scores on a "PSA is a decision" scale. Men with higher prostate cancer knowledge levels were more likely to perceive PSA screening as a decision. Conversely, African American men and those who had discussed the PSA with a doctor were less likely to do so. Predictors of higher preferred levels of involvement (shared decision-making or make decision themselves versus doctor decides) included the intervention condition, younger age, and PSA discussion with doctor. For higher actual levels of involvement in the screening decision, predictors included intervention condition, PSA discussion with doctor, and higher self-efficacy. Across all study cites, there was concordance between preferred and actual levels of involvement for only about one-quarter of men. Predictors of concordance included intervention condition, PSA discussion with doctor, and higher self-efficacy.
Conclusions: A community-based IDM intervention can positively influence clinical decision-making about PSA screening, increasing men's perceptions that PSA screening is a decision and their preferred and actual levels of involvement in the decision-making process. Additional research is needed to understand the content, dynamics, and influence of men's interactions with providers on their PSA decision-making.
Implications for Policy, Practice or Delivery: Informed decision-making approaches are needed to facilitate consumer engagement in decisions about health issues.
Funding Source: CDC

Consumer Decision-Making & Quality-of-Care Information: Increasing Consumer Engagement & Knowledge

Chair: Kristin Carman, Ph.D.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

▪ The Relationship between Health Literacy and Diabetes Knowledge and Readiness to Take Health Actions

Dawn Clancy, M.D., M.S.C.R., Elizabeth G. Hill, Ph.D.

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Research Objective: The purpose of this study was to explore the relationship among health literacy, patients' readiness to take health actions, and diabetes knowledge among individuals with type 2 diabetes.
Study Design: Sixty-eight patients with type 2 diabetes, receiving care in an academic General Internal Medicine clinic, were administered the Rapid Estimate of Adult Literacy in Medicine (REALM) literacy instrument prior to completing the Diabetes Health Belief Model (DHBM) scale and Diabetes Knowledge Test (DKT). Multivariable linear regression was used to assess association between REALM literacy level, DKT score, DHBM scale score, and most recent hemoglobin A1c, while controlling for other covariates of interest.
Population Studied: Forty-Five African American and 23 Caucasian uninsured and underinsured patients with type 2 diabetes receiving care in a general internal medicine academic health center clinic.
Principle Findings: After controlling for other covariates of interest, no significant association between DHBM scale score and REALM literacy level was found ($p = 0.29$). However, both DKT score and most recent hemoglobin A1c level were found to be significantly associated with patient literacy ($p = 0.004$ and $p = 0.02$, respectively). Based on the multivariable model, patients with less than a 4th grade literacy level had 13% lower DKT scores (95% CI = -28% to -2%, $p = 0.08$) and 1.36% higher most recent hemoglobin A1c levels (95% CI = 1.06% to 1.73%, $p = 0.02$) relative to those with a high school literacy level.

Conclusions: Low health literacy is a problem faced by many patients that affects their ability to navigate the health care system and manage their chronic illnesses. While low health literacy was significantly associated with worse glycemic control and poorer disease knowledge in patients with type 2 diabetes, there was no significant relationship with their readiness to take action in disease management.
Implications for Policy, Practice or Delivery: Low health literacy is a problem faced by many of our patients and affects their ability to navigate our health care system and manage their chronic illnesses. While low health literacy seems to be associated with worse glycemic control and poorer disease knowledge in diabetics, it does not appear to be related to their readiness to take action in managing their disease. Health care providers should consider offering education appropriate for low-literate patients to assist them in self-management of disease.
Funding Source: AHRQ, RWJF

- **Factors Associated with Use of Providing Computerized Tailored Information on Quality of Health Care of Health Plans During Open Enrollment Period for Small Business Employees in California**

Banafsheh Sadeghi, M.D., Candidate to Ph.D., Michael Hogarth, M.D., Jorge Garcia, M.D., Julie Rainwater, Ph.D., Daniel Tancredi, Jason Simon,

Presented By: Banafsheh Sadeghi, M.D., Candidate to Ph.D., Graduate Student Researcher, Epidemilogy, University of California, Davis, One Shield Avenue, Davis, CA 95616, Phone: (510) 918-7669, Email: bsadeghi@ucdavis.edu

Research Objective: We used an interactive, web-based decision-making tool to provide small business employees with comparative information about health plan and medical group quality of care during the open enrollment in 2005. The tool was designed to enable employees to generate customized quality reports (and health plan rankings) based on their specific health needs and concerns, thereby increasing the salience of the information and removing perceived barriers to its use. The main purpose of this analysis was to examine the characteristics of those employees who used the website, compared with those who did not, and to study how the employees used the website to compare quality across health plans.
Study Design: Prospective cohort nested within a randomized controlled field trial. Employee-level and employer-level factors associated with use of the intervention were identified using cluster and stratum-adjusted bivariate analysis and generalized estimating equations; confounding relationships were explored using directed acyclic graphs.
Population Studied: We drew a stratified cluster sample of 4505 small business employees who were nested within 384 health insurance brokers from small business employees in California with health coverage through Pacific Health Advantage, a now-defunct small business purchasing pool. Brokers were stratified into five groups based on their distribution of employer size. Within each stratum, employers whose Open Enrollment fell during a 3-month study period with at least two choices of HMO plans were randomly assigned to either a treatment group or a control group.
Principle Findings: The main outcome variable was whether an employee used the website. 76 employees (1.8%) used the website and generated a total of 125 reports. Age, income, family structure, and enrollment in Kaiser Permanente were significant predictors of visiting our website in bivariate analyses. In multivariate analysis, age (Odds Ratio [OR] 1.03; 95 % CI 1.01-1.05), propensity of workplace access to computers and the web (OR 1.70; 95 % CI 1.04-2.78), enrollment in Kaiser Permanente (OR 0.13; 95 % CI 0.03-0.65), and having five choices of health plans (OR 0.43; 95 % CI 0.22-0.84) were significantly associated with the outcome. All of the ten most frequent concerns chosen by users to compare health plans related to health plan services and structure. Thirty-three of the employees (42%) who visited the website filled out and submitted an online questionnaire. Nine of these respondents (27%) stated that the information they received from the website had high or very high influence on their decision-making.
Conclusions: Workplace access to computers and the web, and type of current plan, may be considered important determinants of web-based information-seeking behavior regarding health plan quality among small business employees. Although there was low usage of our website, many of those who visited the website were influenced by the information when choosing their plans.
Implications for Policy, Practice or Delivery: Small business employees may be considered a hard-to-reach group of employees through web-based tools for health plan or medical group choice. Although tailoring quality-of-care information based on individuals' own health

concerns remains a promising strategy, more research is needed to understand factors that may increase small business employees' usage of quality information.
Funding Source: AHRQ

- **Patient Concerns about Hospital Quality and Physician Assessments of Hospital Quality Reports**

Kevin Smith, M.A., Shulamit Bernard, Ph.D., David Miranda, Ph.D.

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Research Objective: Primary care physicians are important intermediaries in decisions about hospital choice. Comparatively little is known about interactions between physicians and patients with regard to these choices. The objectives of this analysis were to determine the extent to which patients raise questions about hospital quality with their physicians and to examine associations between this behavior and physician perceptions of hospital quality reports.
Study Design: The analysis was based on data from the 2006 Physician Assessment of Hospital Quality Reports survey. The multimode survey was sent to a stratified random sample of physicians in three specialties: Family/General Medicine, Internal Medicine, and Cardiology. Physicians estimated the number of adult admissions and referrals during the 3 previous months who had asked them specific questions hospital quality. Respondents also indicated their familiarity with the CMS Hospital Compare website and rated the usefulness of hospital quality reports. Survey responses were weighted for stratification and nonresponse to be nationally representative of physicians in the selected specialties.
Population Studied: The target population was physicians in primary care specialties and cardiology, who play a central role in decisions about hospital choice.
Principle Findings: A total of 1,027 physicians completed surveys (62% of those eligible). Overall, 40% of physicians reported that one or more patients had asked about hospitals providing the best care, 37% had patients ask about the reasons for recommending a particular hospital, and 31% had patients ask about the experiences of other hospitalized patients. Half of the physician sample (50.3%) had been asked one or more of these three questions in the previous three months. Compared to those who had not recently been asked hospital performance questions by any patients, physicians who reported being asked were significantly more likely to agree that hospital ratings were important for making referral decisions (43% vs. 27%), that they would like to have more information about hospital quality (50% vs. 34%), and that they would rely on quality ratings to make referrals in the future (32% vs. 18%). Physicians who had been asked about hospital quality were also more likely to have seen or heard about Hospital Compare (23% vs. 16%) and to say that Hospital Compare was quite useful or extremely useful for making admission and referral decisions (21% vs. 9%).
Conclusions: During a three-month period, half of primary care physicians and cardiologists were asked key questions about hospital quality by referred or admitted patients. Physicians who had been asked these questions had more favorable assessments of hospital quality reports and Hospital Compare than those who had not been asked.
Implications for Policy, Practice or Delivery: While physicians who find hospital reports to be useful may be more likely to initiate quality discussions with their patients, questions raised by patients also influence physicians' views of quality reports. Encouraging patients to ask about hospital quality may increase physician interest in hospital quality reports and their assessment of the value of these reports.
Funding Source: CMS

- **Provider Monitoring and Pay-for-Performance When Multiple Providers Affect Outcomes: An Application to Renal Dialysis**

Richard Hirth, Ph.D., Marc Turenne, Ph.D., Jack Wheeler, Ph.D., Qing Pan, M.S., Joseph Messana, M.D.

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Research Objective: Purchasers routinely measure and reward quality and efficiency. Monitoring includes "report cards" for hospitals, surgeons, dialysis facilities and health plans and can indirectly influence care by altering patient flows or informing quality improvement initiatives. "Pay-for-performance" (P4P) systems incorporate direct incentives for measured

performance. To implement performance measures, an appropriate unit of analysis must be selected. Although performance is generally measured at one level (e.g., surgeon or hospital), outcomes depend on multiple providers' actions. In the dialysis context, practice variations across dialysis facilities and nephrologists may independently influence outcomes. The dialysis facility has been the unit of measurement for quality reports and P4P proposals. Although the facility is a convenient unit for measurement, potential drawbacks exist. Selecting the facility implicitly attributes responsibility for practices of non-employee physicians. Ignoring nephrologists' incentives level may miss improvement opportunities. Facility-level measures fail to provide patients with guidance regarding choice of physician. Due to these limitations, the prevailing focus on the facility should be examined empirically.
Study Design: We determined dialysis patients' resource utilization [Medicare Allowable Charges (MAC) per dialysis session for services billed by the dialysis facility other than the dialysis treatment] and clinical outcomes [achieving targets for anemia management (hematocrit (Hct)=33%) and dialysis adequacy (urea reduction ratio (URR)=65%)]. For each patient-month, we identified the primary dialysis facility and nephrologist and calculated MAC/session and % of patients achieving targets for all patients treated by each facility/physician pair. We estimated a mixed model with fixed effects for patient conditions and random effects for facility and physician. Sufficient cross-over existed between facilities and physicians to estimate their separate contributions (in 65% of facilities, more than one physician treated >=5 patients, and 55% of physicians treated >=5 patients in more than one facility).
Population Studied: Using claims for U.S. Medicare hemodialysis patients in 2004, we identified all physician/facility pairs that treated at least 5 patients. A 70% random sample of these pairs was selected for the analysis, resulting in 9,994 physician/facility pairs.
Principle Findings: Mean MAC/session was $81.80, 81% of patients had Hct=33%, and 92% had URR=65%. For each measure, outcomes varied substantially at both levels, but variation was more pronounced at the facility level. The standard deviations (SD) across facilities and physicians, respectively, were $19.45 and $6.76 for MAC/session, 6% and 3% for Hct=33%, and 7% and 3% for URR=65%. The observed resource use variation is large, with the facility-level SD of $19.45 per session translating into $155,600 for a typical-sized facility.
Conclusions: By using data from facilities with multiple physicians and from physicians treating patients at multiple facilities, it is possible to distinguish the variation in performance attributable to facilities from that attributable to physicians. Similar methods could be employed for other types of providers.
Implications for Policy, Practice or Delivery: If dialysis quality measurement and P4P incentives are targeted to only one provider, the facility is the appropriate focus of such measures and incentives. Nonetheless, the existence of variation across physicians raises issues regarding the extent to which quality reports and P4P places facilities at risk for outcomes they only partially control. Cooperative efforts and alignment of incentives between facility managers and nephrologists to optimize outcomes and efficiency will become increasingly important under P4P programs and proposed reforms to pay for more services prospectively.
Funding Source: CMS

- **Development and Validation of a Tool to Assess Health-Related Consumer Engagement among Medicare Beneficiaries**

Sunyna S. Williams, Ph.D.

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Research Objective: The objective of this research was to develop and validate a tool to segment Medicare beneficiaries to permit targeting and tailoring of communication activities. Typically, segmentation is based on self-identified health-related knowledge, attitudes, and behaviors, in this case, skills and motivations pertinent to health care decision-making.
Study Design: Phase I involved the development and psychometric assessment of a supplement in the 2001 Medicare Current Beneficiary Survey (MCBS), the development of a segmentation scheme using cluster analysis, initial validation of the segments, and additional analyses to identify a simple self-report two-item segmentation tool that can easily be administered in the field. In Phase II, the revised supplement was fielded in the 2004 MCBS, to examine the replicability of the factor structure

and the segmentation scheme. Phase III involved formative qualitative research to validate the segments by fleshing out understanding of beneficiaries in each segment. In Phase IV, to conduct additional validation of the segmentation scheme, the two-item tool was included in several datasets, including a mini-survey in conjunction with the formative research, a Medicare communications campaign tracking poll, a Porter Novelli Health Styles survey, upcoming CAHPS surveys, and an upcoming original survey designed to conduct extensive reliability and validity analyses.
Population Studied: Medicare beneficiaries.
Principle Findings: This research identified four beneficiary segments, who vary with regard to skills and motivations pertinent to health care decision-making. Beneficiaries in the Active segment are those who are high on both skills and motivations. Those in the Passive segment are low on both skills and motivations. High Effort beneficiaries are relatively motivated, but also, relatively unskillful. And, Complacent beneficiaries are relatively skillful, but also, relatively unmotivated. The segments vary in expected ways with regard to Medicare knowledge, educational attainment, engagement in health care decisions, Hibbard's Patient Activation Measure score, Porter Novelli Health Styles consumer segment, and health and preventive behavior. They also vary with regard to health status, chronic disease status, health services utilization, and prescription drug use.
Conclusions: Medicare beneficiaries can be segmented in the field using a simple and easily-administered two-item segmentation tool, to permit targeting and tailoring of communication activities. Targeting involves conducting differential outreach communication to different segments, whereas tailoring involves providing differential educational messages and materials to different segments. The primary advantage of such customization is the ability to deliver the appropriate level of information with the appropriate motivational message, matched to the individual, thereby increasing the effectiveness of the communication effort.
Implications for Policy, Practice or Delivery: These findings can be used to inform the development of communication activities to promote informed health care decision-making among Medicare beneficiaries.
Funding Source: CMS

Coverage & Access

Impact of Coverage on Utilization

Chair: Deborah Chollet, Ph.D.

Sunday, June 3 • 3:00 p.m.-4:30 p.m.

▪ The Sociodemographic Predictors of Clinical Trial Participation: Are the Uninsured Using Industry-Sponsored Treatment Protocols for Their Healthcare Needs?

Darren Zinner, Ph.D.

Presented By: Darren Zinner, Ph.D., Research Fellow, Institute for Health Policy, Massachusetts General Hospital, 50 Staniford Street, Suite 901, Boston, MA 02114, Phone: (617) 726-1382, Fax: (617) 724-4738, Email: dzinner@partners.org

Research Objective: To determine whether differences in the enrollment of study subjects by clinical trial sites within the same protocol can be explained by characteristics of the local population.
Study Design: Multivariate regression analysis of final enrollment statistics, controlling for protocol-, investigator-, and study site-characteristics, for 5,902 trial-sites across 269 outpatient protocols initiated from three top-ten pharmaceutical firms between 1999 and 2004 and closed by January 2005.
Population Studied: Academic, community, and professional research sites within industry-sponsored clinical trials.
Principle Findings: Many of the sociodemographic variables previously thought to be associated with higher clinical trial participation (e.g., population size, poor education, low income) do not show a statistically-significant association. Several race/ethnicity variables influence trial enrollments, but only through their association with insurance status. In constrast, a one standard-deviation increase in the proportion of residents within a metropolitan statistical area without health insurance is associated with a 4.8 percent increase in the number of study subjects enrolled at clinical research centers in that region ($p<.001$). This effect is almost exclusively concentrated within protocols exploring chronic conditions (vs. life-threatening conditions; $p<.001$), for professional and community-based research centers (vs. academic centers; $p<.001$ and $p=.001$, respectively), and for low-income

residents without an established access point to the health care system (p<.001). The likelihood of a clinical site achieving higher-than-average enrollment within a given protocol is further increased in areas with fewer specialty physicians (OR: 1.28, p=.005), in states without uncompensated-care pooling policies (OR: 1.20, p=.023), and in regions where uncompensated hospital care is concentrated within relative few safety-net providers (OR: 1.23, p=.009).
Conclusions: The results provide evidence of a hole in the safety net system across the country; rather than seeking therapy for their chronic ailments through traditional health care providers, the uninsured are disproportionately entering into clinical trials for the care of these conditions. Because this association is higher for protocols involving chronic conditions, for patients without a usual source of care, in areas with fewer safety-net choices, and in professional trial research sites that must advertise for study subjects, the data suggest that the uninsured may be choosing to enroll in clinical trials rather than seeking care from established safety-net providers.
Implications for Policy, Practice or Delivery: The strong correlation between uninsurance and clinical trial participation in this study raises many questions regarding the fairness of research participation, the ethics of post-trial access, and even the underlying scientific validity of the clinical research enterprise.
Funding Source: Division of Research at the Harvard Business School

- Risk Adjusted Subsidies for the Chronically Ill

William Dow, Ph.D.

Presented By: William Dow, Ph.D., Associate Professor of Health Economics, School of Public Health, UC-Berkeley, 408 Warren Hall #7360, Berkeley, CA 94720-7360, Phone: (510) 643-5439, Email: wdow@berkeley.edu

Research Objective: The primary role of health insurance is to spread the risk of high health expenditure due to illness. This includes the risk of high health insurance premiums among the chronically ill. Spreading this risk requires ill individuals to be subsidized by healthier individuals. Current health insurance markets are imperfect at spreading such risks, in part due to adverse selection problems. This has contributed to uninsurance among the chronically ill (because of the difficulty in finding insurance outside of the large group market) and among low risks in small or community-rated risk pools. This problem has also contributed to dead-weight "cherry-picking" activities by insurers, and to labor market inefficiencies due to job-lock. There are many potential options for government intervention to address these problems. This paper analyzes two specific policy options, both from a theoretical perspective and via empirical simulations:
(1) Ex-post government reinsurance: Recent proposals in the health policy literature (such as by Swartz, and as implemented in New York) have focused on government "reinsurance" to reduce the losses of private health insurance companies from ex-post high expenditures by their enrollees. We note that such proposals have been criticized as unnecessarily expensive because of their crude targeting. Cogan, Hubbard and Kessler (2005), for example, argue that private insurance markets already function well at spreading risk from randomly high medical expenditures; insurance market failures instead are centered on the subset of high spenders who are ex-ante predictably high risk.
(2) Risk-adjusted premium subsidies: Risk-adjustment methods have advanced sufficiently that it is now possible to consider predicting ex-ante the expected health costs in a given risk pool (van de ven and Ellis, 2000). These predictions could be used to tax healthy risk pools and subsidize sicker risk pools, in order to reduce incentives to game risk pools and instead better focus insurer efforts on producing high value products. We consider the economic merits of various designs for implementing such cross-subsidy schemes, specifically within the institutional context of current U.S. health insurance markets. In addition, we consider several mechanisms to implement government premium subsidies in this risk-adjustment framework.
Study Design: We will first conceptually analyze each of the considered mechanisms for cross-subsidizing risk pools in terms of their impacts on addressing health insurance market failures. Next, we will use Medical Expenditure Panel Survey (MEPS) data to model the effects of alternative policy options on insurance premiums and uninsurance among different populations. Finally, we will use MEPS data to simulate the premium effects, uninsurance effects, and budgetary cost of potential levels of government subsidies to the above schemes.
Population Studied: U.S. non-Medicare
Principle Findings: Preliminary analysis has modeled national alternatives with annual budgetary costs of $1-10 billion. These would

lead to simulated reductions in uninsurance of between 1-3 million persons, with the effects depending critically on the details of the subsidy mechanism.
Implications for Policy, Practice or Delivery: Given the prominence of recent health policy proposals in this area (e.g., reinsurance was supported by Senator John Kerry during the 2004 presidential campaign), more detailed economic analysis of this class of proposals should be of great interest.
Funding Source: University

- Are Cancer Survivors Locked into Jobs with Health Insurance?

Kaan Tunceli, Ph.D, Pamela Farley Short, Ph.D., John Moran, Ph.D., Ozgur Tunceli, Ph.D.

Presented By: Kaan Tunceli, Ph.D, Research Scientist, Center for Health Services Research, Henry Ford Health System, One Ford Place, Detroit, MI 48202, Phone: (313) 874-5485, Email: ktunceli@hfhs.org

Research Objective: Job-related health insurance is particularly valuable to cancer survivors, given their elevated claims risk and limited access to individual insurance markets. This study tested the hypothesis that cancer survivors, as a consequence, are more likely to remain in jobs with health insurance than other workers.
Study Design: A difference-in-difference approach was used to identify and measure insurance-related job lock. We hypothesized that differences in the probability of employment transitions that are associated with job-related health insurance would be greater for cancer survivors than other workers. Linear probability models tested for negative interactions between cancer survival and health insurance in predicting labor force exits, reductions in hours, and job changes. We controlled for other job characteristics (pension type, occupation, job tenure, and full-time status) that are also associated with job quality and could otherwise induce a negative correlation between health insurance and employment transitions. We also controlled for sociodemographic characteristics, length of follow up, comorbidities, and spouse's health insurance and employment status.
Population Studied: We compared longitudinal data for the period 1997-2002 from the Penn State Cancer Survivor Study (PSCSS) to similar data for workers with no cancer history in the Health and Retirement Study. The PSCSS included 504 survivors aged 55-65, who were employed when diagnosed from 1997 through 1999. We selected 3903 similarly aged HRS subjects without cancer who were working on randomly assigned "baseline" dates matching the distribution of diagnosis dates for the cancer survivors. After the self-employed and involuntary job separations (lay-offs or business closures) were excluded, there were 3433 individuals (398 cancer survivors) in the final sample. Changes in employment from baseline/diagnosis in 1997-1999 to follow up in 2002 were compared between samples.
Principle Findings: The interaction of cancer survivorship with health insurance at baseline/diagnosis was negative and significant in predicting labor force exits for both genders (male: marginal effect [ME] = -26 percentage points (pp), $P < 0.01$; female: ME = -14.3 pp, $P < 0.05$). Among individuals employed at follow-up, the interaction of cancer survivorship with health insurance was also negative and significant in predicting changes from one job to another (male: ME = -40.5 pp, $P < 0.01$; female: ME = -27 pp, $P < 0.01$). Among full-time workers at baseline/diagnosis, cancer survivors with health insurance were significantly less likely to switch to part-time work than other workers (male: ME = -22.9 pp, $P < 0.01$; female: ME = -20.9 pp, $P < 0.01$).
Conclusions: Job-related health insurance figures more importantly in the employment decisions of cancer survivors compared to workers without cancer.
Implications for Policy, Practice or Delivery: The employment opportunities of cancer survivors are more tightly constrained by health considerations than other workers'. This "job lock" represents an additional component of the economic burden of cancer on survivors. Public policies that encourage early cancer screening and detection, as well as improvements in treatment, have contributed to remarkable growth in the number of cancer survivors. Public policies that provided affordable alternatives to job-related health insurance would improve the economic opportunities and quality of life of these survivors.
Funding Source: NCI

- An Exploration of Urban and Rural Differences in Lung Cancer Treatment among Medicare Beneficiaries

Lisa R. Shugarman, Ph.D., Melony E.S. Sorbero, Ph.D., Haijun Tian, Ph.D., Steven M. Asch, M.D., M.P.H., Arvind K. Jain, M.S., J. Scott Ashwood, M.A.

Presented By: Lisa R. Shugarman, Ph.D., Health Policy Researcher, RAND Corporation, 1776 Main Street, PO Box 2138, Santa Monica, CA 90407-2138, Phone: (310) 393-0411 x.7701, Fax: (310) 260-8161,
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Research Objective: Little is known about urban/rural differences in the quality of care for cancer patients in the United States. Rural areas are faced with challenges recruiting and retaining providers and keeping hospitals viable. Health care facilities in rural areas are not always able to offer the same array of services available to residents of urbanized areas. As a result, older rural patients often have to travel farther and wait longer for care than their urban counterparts. This study evaluates to what extent rural residence influences the receipt of appropriate lung cancer treatment.
Study Design: Secondary data analysis using Surveillance, Epidemiology, and End Results (SEER) data merged with Medicare claims and linked to the Area Resource File. Measures of appropriate treatment for lung cancer were derived from ASCO and NCCN treatment guidelines. The Rural-Urban Commuting Area (RUCA) codes were used to define urban/rural residence. Multivariate logistic regression models controlled for socio-demographic, clinical, community, and health system characteristics.
Population Studied: Medicare beneficiaries age 65 and older residing in a SEER registry region at the time of their lung cancer diagnosis between 1995 and 1999 and followed until December 2003. The sample includes beneficiaries with a primary diagnosis of lung cancer who were continuously enrolled in both Medicare Part A & B for the year prior to and at least 8 months after diagnosis. Beneficiaries enrolled in managed care, with ESRD, or eligible for Medicare due to disability were excluded from the sample (N=24,758).
Principle Findings: In descriptive analyses, we observed a non-linear but significant relationship between urban/rural residence and the likelihood of Stage I cancer patients receiving lung resection surgery within six weeks of diagnosis; urban and isolated rural residents were more likely to receive timely treatment as compared to large and small rural town residents. Urban residents diagnosed with Stage IV cancer were also significantly more likely to receive timely chemotherapy as compared to rural residents. However, after controlling for other characteristics, urban/rural differences for Stage I patients disappeared but differences for Stage IV patients held. These findings were robust to sensitivity analyses using different timeframes for receipt of treatment. A greater presence of subspecialists per population, including medical oncologists, had a moderate and positive influence on the receipt of lung resection surgery ($p<0.05$) but a negative association with receipt of chemotherapy ($p<0.05$).
Conclusions: These findings suggest that geographic residence may play a role in the timely receipt of some treatments for Medicare beneficiaries with lung cancer. Provider supply may play a role in the timely receipt of treatment but the reason for differences in the direction of this relationship across models is not yet clear.
Implications for Policy, Practice or Delivery: Concerns that rural residents are at a disadvantage when it comes to the timely receipt of health care may be valid for lung cancer patients. Chemotherapy is a time-intense treatment and requires multiple visits. Distance to providers could serve as an impediment to treatment for elderly patients and health care planners and policymakers should consider whether cancer treatment is suitably accessible for rural patients.
Funding Source: HRSA

- **Differences in Breast Cancer Diagnosis and Treatment: Experiences of Insured and Uninsured Patients in a Safety Net Setting**

Cathy Bradley, Ph.D., David Neumar, Ph.D., Lisa Schickle, M.S., Nicholas Farrell, M.D.

Presented By: Cathy Bradley, Ph.D., Professor, Health Administration, Virginia Commonwealth University, 1008 E Clay Street, Richmond, VA 23298, Phone: (804) 828-5217, Fax: (804) 828-1894, Email: cjbradley@vcu.edu

Research Objective: Instead of universal coverage, the United States relies on a safety net system to treat uninsured patients, including patients with chronic, life threatening and costly diseases such as breast cancer. Differences in breast cancer stage and survival between uninsured and insured women have been well-documented, in spite of the options, beyond a safety net provider, for subsidized breast cancer care that is available to breast cancer patients. This study evaluates the role of health insurance on breast cancer treatment at a large urban safety net hospital system.
Study Design: From the patient population at the Massey Cancer Center, part of Virginia Commonwealth University Health Care System

(a large regional safety net provider in central Virginia), we selected women ages 21 to 64 diagnosed with breast cancer between January 1999 and March 2006 (n=1381). We used billing records to identify health insurance status of these patients to compare the stage of disease and tumor size at diagnosis, the number of days between diagnosis and surgery and the number of days to initiate chemotherapy, and the number of days to complete a common adjuvant chemotherapy regimen of doxorubicin plus cyclophosphamide (AC) or doxorubicin plus cyclophosphamide followed by paclitaxel (ACT) between surgery and chemotherapy initiation for women with and without insurance. We estimate models with and without census tract variables, which reflect the social context in which patients reside.

Population Studied: We identified women between age 21 years and 64 years diagnosed with a first primary breast tumor with an AJCC stage of 0, I, II, or III. Patients with distant metastases were excluded. We chose age 64 as the upper limit because almost all women qualify for Medicare coverage at age 65. After exclusions, the remaining sample size was 1,381 women of which 1164 were privately or military insured and 217 were uninsured.

Principle Findings: Our analysis shows that women without insurance were more likely to be diagnosed with more advanced cancers and correspondingly larger tumors. Uninsured women experienced considerable delays from the date of diagnosis to surgery and from surgery to chemotherapy initiation compared with insured women (21.5 and 22 days longer, respectively). Uninsured women also took significantly longer to complete adjuvant chemotherapy regimens relative to insured women (4 and 26 days for AC and ACT, respectively). These estimates remained robust when census tract variables were added to the models.

Conclusions: In this study, women without health insurance had more advanced cancer and larger tumors than women with health insurance. Uninsured women also experienced considerable delays in receiving treatment and treatment completion relative to insured women. Yet, all women were treated at a safety net hospital that, as part of its mission, treats uninsured patients. The relationship between insurance status and outcomes were robust across different models and samples, some of which included patient's census tract of residence.

Implications for Policy, Practice or Delivery: This study demonstrates that there are differences in care delivery and completion that are correlated with the absence of health insurance. An expansion of the safety net has been sought as a way to provide access to health care for uninsured persons. Our study indicates that even with the safety net system in place, health insurance is a vital part of optimal health care delivery to patients.

Funding Source: CWF

Access to Care for Uninsured Families & Children

Chair: Timothy McBride, Ph.D.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ Churning in Medi-Cal and Healthy Families and its Effects on Access to Physician Services

Shana Lavarreda, M.P.P.

Presented By: Shana Lavarreda, M.P.P., Senior Research Associate, Health Services, UCLA Center for Health Policy Research, 10960 Wilshire Boulevard, Suite 1550, Los Angeles, CA 90024, Phone: (310) 794-2261, Fax: (310) 794-2686, Email: shana@ucla.edu

Research Objective: This project examines data from the 2003 California Health Interview Survey (CHIS 2003) to ascertain the association between churning in California's Medicaid and SCHIP programs (called Medi-Cal [MC] and Healthy Families [HF], respectively) and a child's access to physician services. The focus is on three measures of access to care: 1) having a usual source of care over the past 12 months, 2) reporting any delay in care in the past 12 months, and 3) having visited a doctor at least once in the past 12 months. Additionally, the impact of insurance status on which type of usual source of care is reported.

Study Design: CHIS 2003 is the most recent dataset available from this bi-annual survey. Surveying over 42,000 households, CHIS 2003 is one of the largest health surveys in the country, and is by far the largest state-specific survey. Independent variables (age, gender, race/ethnicity, health status, household income, place of residence) were used as a set of constant predictors in each of four different models. Logistic regression was used to estimate the impact of insurance status for the three dichotomous outcome measures. The

analysis included calculation of coefficients, odds ratios, predicted margins and relative risks. A multinomial logistic regression was performed to estimate the fourth outcome measure (type of usual source of care), including calculation of odds ratios and relative risks.
Population Studied: This study excludes those who do not have an impact on churning in MC/HF (i.e. children with continuous private coverage), leaving a total sample of 3,842 children, ages 0-17.
Principle Findings: Compared to having MC/HF all year, children who lost their public health insurance had two and half times the probability in reporting a delay in getting necessary care (RR = 2.25; OR = 2.53, p = 0.000) and slightly decreased the risk of having seen a doctor in the past year (RR = 0.93; OR = 0.59, p = 0.044). The slight dip in those reporting not having a usual source of care was not statistically significant. Children who were uninsured all year fared the worst, being significantly less likely to have a usual source of care (RR = 0.86; OR = 0.35, p = 0.000) or to have seen a doctor in the past year (RR = 0.81; OR = 0.32, p = 0.000), as well as increasing the risk of having a delay in care by 53% (RR = 1.53; OR = 1.61, p = 0.003). The multinomial logistic model did not yield conclusive results to indicate much difference between children with continuous MC/HF and those who were churning into and out of the programs.
Conclusions: Dropping out of MC/HF does indeed worsen access to physician services. Children who gained coverage, however, had slightly better outcomes than did children who were uninsured all year, indicating MC/HF have beneficial effects on access to care.
Implications for Policy, Practice or Delivery: These findings support claims that increased enrollment and retention of children in MC/HF will improve their access to physician services, indicating MC/HF expansion would positively impact children's health.

- How We Measure Matters: Conceptualizing Insurance Status When Evaluating Unmet Need among Low-Income Adults

Heidi Allen, M.S.W, Bill Wright, Ph.D., Matthew Carlson, Ph.D., Tina Edlund, M.S.

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Research Objective: This study uses data from a three-year longitudinal panel study to assess whether different methods of measuring coverage lead to disparate conclusions about the impact of uninsurance on low-income adults' access to needed health care.
Study Design: This study used a series of multi-wave mail surveys over a period of 30 study months. Insurance coverage is conceptualized in three ways – a traditional "static point in time" measure, a series of static measures spread across multiple data collection points, and a "total amount of time uninsured" measure. These three methods are applied to the same underlying dataset in a logistic regression model evaluating the likelihood of having unmet health care needs. Results from each model are compared to determine the relative strengths and weaknesses of each conceptual approach to defining insurance status.
Population Studied: Participants were adults enrolled in Oregon's Medicaid program, the Oregon Health Plan (OHP), in February 2003.
Principle Findings: Coverage 1 (Static, Point in Time): When a static/cross sectional coverage variable is regressed on unmet need, results indicate that being uninsured is associated with 3 ½ times greater odds (OR = 3.497) of reporting unmet need relative to being insured. Coverage 2 (Static, Multiple Points in Time): When coverage was conceptualized as three "point in time" measures across the study period, results show each time a person reported being uninsured was associated with just over twice (OR = 2.193) the odds for unmet need relative to someone who reported no points of uninsurance during the study period. Thus, those who were uninsured at two of the three data points had four times (OR = 4.386), and those uninsured at all three data points had six times (OR = 6.579), greater odds for unmet need relative to those who were not uninsured at any of the three data collection points. Coverage 3 (Actual Time Uninsured): When coverage was conceptualized as the number of three-month spans spent uninsured (out of ten three-month spans that elapsed during the study period), results show each three-month span of uninsurance is associated with a 25% increase in the odds of reporting unmet need (OR = 1.25) relative to those who had no uninsurance during the study period. Thus, someone experiencing two spans of uninsurance (6 months out of 30) during the study had 2 ½ times greater odds (OR = 2.512) of experiencing unmet need, while someone experiencing ten spans of uninsurance (the entire length of the study) had 12 times

greater odds (OR = 12.56) relative to a continuously insured person.
Conclusions: These results suggest how we measure insurance coverage definitely matters. Our data indicate static measures of coverage overestimate the effect of short-term uninsurance and underestimate the effects of longer uninsurance periods.
Implications for Policy, Practice or Delivery: The tendency of static coverage measures to underestimate the impacts of long-term uninsurance may be of critical importance for researchers hoping to understand the true "net effect" of coverage loss. Policy-makers should be aware that extensive uninsurance requirements for public insurance might expose individuals to increasing risk for unmet healthcare needs.
Funding Source: CWF

- Accuracy in Self-Reported Health Insurance Coverage and Bias to Survey Estimates of Uninsurance

Kathleen Call, Ph.D., Gestur Davidson, Ph.D., Michael Davern, Ph.D.

Presented By: Kathleen Call, Ph.D., Associate Professor, Health Policy and Managment/SHADAC, University of Minnesota, 2221 University Avenue, Suite 345, Minneapolis, MN 55414, Phone: (612) 624-3922, Fax: (612) 624-2196, Email: callx001@umn.edu

Research Objective: There is consensus that population surveys of health insurance coverage undercount the number of individuals enrolled in Medicaid. That is, the number of individuals with Medicaid coverage derived from surveys is consistently lower than the count of individuals enrolled in Medicaid based on state administrative records. This is referred to as the "Medicaid undercount." The existence of a Medicaid undercount implies that Medicaid recipients do not report Medicaid coverage in surveys asking about health insurance coverage. It is assumed that Medicaid enrollees either do not understand that they are enrolled or they are embarrassed to report their enrollment and instead report that they have no insurance thereby leading to undercounts of Medicaid coverage and overcounts of uninsurance. Our research (1) directly tests the assumption that Medicaid enrollees are inaccurate reporters of coverage and instead say they are uninsured, (2) examines factors associated with accurate and inaccurate reports of coverage, and (3) we calculate the extent of bias to uninsurance estimates introduced by misreports of a lack of coverage among Medicaid enrollees.
Study Design: Using experimental data from three states (California (n=1316), Florida (n=940), and Pennsylvania (n=1392)) we examine whether those who are known to have Medicaid actually misreport being uninsured in surveys, as well as how many accurately report Medicaid coverage, and calculate bias to survey estimates introduced by false reports of no coverage. Using logistic regression we examine characteristics of enrollees and characteristics of their public program enrollment associated with correct reports of Medicaid coverage and inaccurate reports of having no insurance coverage at all.
Population Studied: Non-institutionalized general populations and state Medicaid enrollees.
Principle Findings: We find that most Medicaid enrollees report their coverage correctly (upwards of 80%), some misreport the type of coverage they have (between 6-17%), and very few erroneously report they have no coverage (between 3-10%), leading to little upward bias in estimates of uninsurance (1 percentage point or less). A variety of sociodemographic characteristics (e.g., age, household income, employment status), health status and program enrollment characteristics (e.g., enrollment in Medicaid Managed Care, partial benefits, SSI and TANF receipt) are associated with correcting reporting enrollment in Medicaid. By contrast, it is primarily features of their public program participation that are associated with misreporting a lack of health insurance coverage.
Conclusions: Contrary to long held assumptions, Medicaid enrollees are reasonably accurate reporters of insurance status. Further, the amount of upward bias introduced by those who mistakenly say they are uninsured is modest.
Implications for Policy, Practice or Delivery: Our results should increase policymakers' confidence in using survey estimates of uninsurance to inform of health reform decisions. Further, our results raise concerns about simulation models that make adjustments for the discrepancy between administrative and survey counts of Medicaid enrollment. Based on assumptions our results do not support, these models draw heavily from the ranks of the uninsured when reassigning respondents to Medicaid status in order to match administrative data counts of enrollment.
Funding Source: RWJF, HCFO

▪ A National Assessment of the Impact of SCHIP on Access to Care

Lisa Dubay, Ph.D., Sc.M., Genevieve Kenney, Ph.D.

Presented By: Lisa Dubay, Ph.D., Sc.M., Associate Professor, Department of Health Policy and Management, The Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, Room 488, Baltimore, MD 21205, Phone: (410) 502-0985, Email: ldubay@jhsph.edu

Research Objective: To conduct the first national analysis to assess the impact of eligibility expansions on access to care among children who enroll in the SCHIP program.
Study Design: The SCHIP program was enacted as part of the BBA in 1997. This study uses three years of cross-sectional data from the National Survey of America's Families (NSAF) to assess the impact of the expansion in eligibility on access to care for children who enroll. Children with income below 300 percent of the federal poverty level in 1997, 1999, and 2000 are analyzed. The main outcomes of interest are parent's confidence in their ability to get needed care, having a usual source of care, and the likelihood of having curative, well-child, and dental visits. The key independent variable is the eligibility threshold for public health insurance programs, which constitutes a key policy lever available to states. The analysis relies on a detailed eligibility simulation to identify children eligible for Medicaid and SCHIP. Multivariate analysis is used to control for child and family characteristics, the price and market for insurance, and the supply of providers. An instrumental variable procedure is used to account for the endogeneity of eligibility and insurance.
Population Studied: A national sample of children in families with incomes below 300 percent of the federal poverty line.
Principle Findings: Among children made eligible for public health insurance by the SCHIP program, those who enroll experience an increase in the probability that their parent are confident that they can obtain needed care for their family of 12 percentage points. In addition, there is an 18 percentage point increase in the probability of having a doctor or other health professional visit, a 25 percentage point increase in the probability of having a well child visit, and a 11 percentage point increase in having a dental visit in the past among those made eligible who enrolled. There was no significant increase in the probability of having a usual source of care.
Conclusions: The SCHIP program can be credited with dramatically improving access to care and use of services for children who were made eligible and enrolled in the new program.
Implications for Policy, Practice or Delivery: Our analysis indicates that the SCHIP program improved access to care nationally for children who were made eligible for and enrolled in the new program. The SCHIP program is up for reauthorization in 2007. One important question concerns what impact SCHIP has had on access to care. This research speaks directly to this issue and indicates that SCHIP improves access to care and increases the use of both curative and preventive services. Without additional federal resources to cover current program costs or to cover more uninsured children, this paper suggests that reauthorization will likely result in reductions in access to care for low-income children.
Funding Source: RWJF

▪ LA Healthy Kids Improves Access

Lisa Dubay, Ph.D., Sc.M., Embry Howel, Ph.D., Louise Palmer, M.A.

Presented By: Lisa Dubay, Ph.D., Sc.M., Research Associate, Department of Health Policy and Management, The Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway, Room 488, Baltimore, MD 21205, Phone: (410) 502-0985, Email: ldubay@jhsph.edu

Research Objective: To assess the impact of the Healthy Kids program in Los Angeles County on access to care and use of services for young children not eligible for Medicaid or SCHIP.
Study Design: In July 2003, a new program called Healthy Kids began in Los Angeles County, California with the goal of extending universal health insurance for children in families with incomes below 300 percent of the federal poverty level who were ineligible for Medicaid or SCHIP. A two-wave telephone survey of the parents of children enrolled in the program was conducted using a longitudinal design. The first wave interviews were conducted in 2005 and the follow-up wave one year later. Two samples of parents of children were interviewed: those who just enrolled their children and those whose children had been enrolled in the program for at least one year. An initial sample of 1,430 children was drawn, with 86% responding to the wave one survey and about 75% of parents responding

to both waves. Each sample was asked about access to care and use of services in the six months prior to the interview. In the case of the new enrollees, this period was mostly characterized by uninsurance, whereas established enrollees were covered by the Healthy Kids program during this period in the first wave. A difference-in-difference methodology is used to assess the impact of the program on access to care, using the established enrollees as a control for changes in the program and children's maturation. Outcomes of interest include having a usual source of medical and dental care, having a doctor visit or a well child visit, and parents' perceptions of their ability to get needed care. Multivariate analyses are used to account for differences in the two groups.
Population Studied: A sample of children ages 1 to 5 enrolled in the Los Angeles Healthy Kids, mostly Latino undocumented immigrant children with family incomes below poverty.
Principle Findings: Preliminary evidence suggests that the program led to almost a 20 percentage point increase in the probability of having a usual source of medical care, a 30 percentage point increase in the probability of having a usual source of dental care, small and insignificant increases in medical and well child visits, a 15 percentage point increase in the probability that the parent is confident that they can obtain medical care and a 25 percentage point reduction in the probability that meeting the child's heath care will create financial burdens.
Conclusions: The Los Angeles Healthy Kids program has led to large and meaningful improvements in the continuity of care provided to young low-income children enrolled in the program. Smaller effects were found on use of services in large part due to the strong safety net that exists in Los Angeles County.
Implications for Policy, Practice or Delivery: Programs expanding coverage to low-income undocumented children can result in dramatic improvements in their continuity of care and their parent's ability to obtain needed care for their children without creating financial burdens.
Funding Source: First 5 LA

The Uninsured & Underinsured & Disparities in Access to Care

Chair: Pamela Farley Short, Ph.D.

Tuesday, June 5 • 10:45 p.m.-12:15 p.m.

▪ Health Insurance, Health, and Low-Wage Worker

Sherry Glied, Ph.D., Bisundev Mahato, B.A.

Presented By: Sherry Glied, Ph.D., Professor, Health Policy and Management, Mailman SPH, Columbia University, 600 West 168th Street, 6th Floor, New York, NY 10032, Phone: (212) 305-0299, Fax: (212) 305-3405,
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Research Objective: There were 46.6 million uninsured people in the United States in 2005. Of this group, well over half were employed and 2/3 were members of working families. Recent changes in employer-sponsored coverage – including increases in required employee premium contributions and higher cost-sharing rates – are likely to pose difficulties for low-wage workers. This study examines how low-wage workers have fared over the 1996-2003 period, in terms of their health insurance, out-of-pocket costs, access to care, and health-related outcomes.
Study Design: This study uses data from the 1996-2003 Medical Expenditure Panel Survey. The MEPS sample participates in the survey for two years. Our descriptive analyses of health insurance and service use examine the sample of workers who have just entered the MEPS survey and are in their first sample year. In our outcomes analyses, we make use of the longitudinal nature of the MEPS by examining how low-wage status in the first sample year affects outcomes in the subsequent (second) sample year. All of our analyses adjust for the complex sampling design of the MEPS.
Population Studied: We focus on full-time, full-year workers, as this is the group of low-wage workers with the strongest attachment to the labor market. We define low-wage workers as those in the bottom quartile of the wage distribution.
Principle Findings: The insurance coverage of low-wage workers deteriorated considerably over 1996-2003, with most of the decline occurring after 2000. The difference in uninsurance rates between higher and low-income workers in 2003 was significantly greater than in 1996, primarily because of a substantial decline in the share of low-wage workers with full-year employer-sponsored coverage. Access to services improved for higher-wage workers over this period, but for low-wage workers, access to services declined. While higher -age workers saw substantial improvements in receipt of preventive health care services-- like blood

pressure, cholesterol, and routine checkups—between 1996-2003, low-wage workers experienced only small improvements or even deterioration in use of these services. These lower rates of access are also apparent in a widening disparity in health care spending levels between higher and lower wage workers. By 2003, higher-wage workers spent over $1250 more annually on health care services than did lower wage workers. This difference remains significant in multivariate analyses controlling for a broad range of characteristics. This lower spending reflected lower rates of use of innovative medical technologies: lower wage workers were substantially less likely to use a prescription medication approved in the prior 20 years than were higher wage workers.
Conclusions: Since the mid-1990s, there has been a growing gap in health service access, use, and outcomes for higher and lower-wage workers.
Implications for Policy, Practice or Delivery: Policies to improve access to care, including expansions of health insurance coverage to lower wage workers, are needed to reduce these disparities.
Funding Source: CWF

▪ Worrying about the Underinsured

Michelle Doty, Ph.D., Alyssa L. Holmgren, M.P.A., Cathy Schoen, M.S.

Presented By: Michelle Doty, Ph.D., Associate Director of Research, The Commonwealth Fund, One East 75th Street, New York, NY 10021, Phone: (212) 606-3860, Fax: (212) 606-3508, Email: mmd@cmwf.org

Research Objective: Based on earlier work, we update 2003 estimates of the number of underinsured adults using data from 2005. We focus on the independent effects of being underinsured and uninsured for any length of time on use of preventive services, access, and bill problems drawing comparisons to insured adults who have more adequate coverage.
Study Design: Using data from the Commonwealth Fund 2005 Biennial Health Insurance Survey, we classified adults as underinsured if they were insured all year but reported at least one of three indicators: out-of-pocket medical expenses amounted to 10% or more of family income, for low-income adults (family income under 200 percent of the federal poverty level) medical expenses amounted to at least 5 percent of income, or health plan deductibles equaled or exceeded 5 percent of family income. Multivariable logistic regression analyses were performed to examine the independent effects of being underinsured and uninsured for any length of time on use of preventive services, access, and bill problems, controlling for age, health status, income, and race and ethnicity.
Population Studied: A nationally representative sample of 3,352 adults ages 19 to 64 were surveyed by telephone in 2005. Respondents were grouped by insurance status, and included 1,026 adults who were uninsured during the year, 334 underinsured adults, and 1,992 adults who were insured all year with adequate coverage.
Principle Findings: In 2005, 28 percent of non-elderly adults were uninsured at some point during the year and an additional 11 percent of adults reported having continuous insurance coverage but were underinsured based on financial indicators. The biggest increase in the proportion of the underinsured from 2003-2005 occurred among adults with income $40K or greater. Despite having insurance, underinsured adults report similar access problems as adults who were uninsured during the year; they are more likely than adults with adequate insurance to forgo needed care because of cost, including not filling a prescription (OR=1.84, p=.01), not getting appropriate tests of follow-up care (OR=1.80, p=.01), not seeing the doctor when sick (OR=2.41, p=.001), or not seeing a recommended specialist (OR=2.15, p=.001). Income, health status, age, and race/ethnicity do not attenuate the association between being underinsured and access problems. Underinsured adults also experience significantly higher levels of financial stress because of medical bills and medical debt than do adults with adequate insurance coverage (OR=3.10, p=.001).
Conclusions: Underinsured adults experience similar problems as the uninsured, including barriers to care and financial stress. Those with moderate incomes and health problems are at particularly high risk of encountering these problems.
Implications for Policy, Practice or Delivery: This study points to the need to focus on the adverse effects on access and financial protection of increasing the amount and type of out-of-pocket payments and decreasing the levels of covered benefits, especially as the health insurance market and employer-based health insurance products continue to evolve to constrain rising health insurance costs.
Funding Source: CWF

▪ Individuals' Use of Care While Uninsured: Effects of Time Since Episode Inception and Episode Length

Carole Roan Gresenz, Ph.D., Jeannette Rogowski, Ph.D., Jose J. Escarce, M.D., Ph.D.

Presented By: Carole Roan Gresenz, Ph.D., Senior Economist, RAND Corporation, 1200 South Hayes Street, Arlington, VA 22202, Phone: (703) 413-1100 x5419, Email: gresenz@rand.org

Research Objective: The uninsured are a diverse group, including individuals who lose health insurance coverage for a short period of time and then quickly become insured again, individuals who periodically switch between having and not having health insurance, and those who are persistently uninsured. While a substantial number of studies have analyzed utilization of care among the uninsured, few have addressed how use of care may vary over the course of an episode of being uninsured or across episodes with varying ultimate durations. This study analyzes how individuals' use of care varies with time since the inception of an episode of being uninsured and with the ultimate length of the episode.
Study Design: We use data from the 1996-2002 Medical Expenditure Panel Survey (MEPS) Household Component (HC) files linked to the MEPS condition, event, and supplemental files. Our sample includes MEPS respondents aged 18-63 who experienced an episode of being without health insurance that lasted between 3 and 23 months. Episodes were excluded if they were in progress at the time the individual was first observed. We use multivariate logistic regression to model the probability that an uninsured individual has (1) any medical expenditures or charges, and (2) any office-based visit during each month of an uninsured episode, accounting for the time since episode inception and the ultimate episode length. We control for detailed measures of health status and socio-demographic factors that influence the demand for medical care.
Population Studied: U.S. adults who experience an episode of being without health insurance between 1996 and 2002.
Principle Findings: We find that the ultimate length of an individual's episode of being uninsured bears relatively little on individuals' use of healthcare in any particular month and that the probability of health care utilization rises during the first year of the episode, with more use in the second six months of the year compared to the first six months.
Conclusions: The finding that patterns of care over the course of an episode are relatively invariant across shorter and longer episodes echoes earlier research findings. The observed pattern of care during the course of an episode may result if it takes time for individuals to locate, schedule and obtain low-cost or free care or if individuals delay care when they first become uninsured with the hope or knowledge that they will regain insurance at some later date.
Implications for Policy, Practice or Delivery: While we found few statistically significant differences in utilization across episode lengths, the relationship between utilization and episode length nonetheless warrants further exploration, and policymakers may still want to consider policies that distinguish between the short- and long-term uninsured. The long-term uninsured may face health repercussions from the cumulative effect of delaying care for a long period of time as well as significant negative financial consequences of long-term periods without insurance.
Funding Source: AHRQ

▪ Racial/Ethnic and Payer Disparities in Access to Emergency Care in U.S. Emergency Departments: Can We Legislate Equity in Health Care?

Valerie Johnston, M.B.A., Yuhua Bao, Ph.D.

Presented By: Valerie Johnston, M.B.A., Ph.D. Student, Health Behavior and Administration, The University of North Carolina at Charlotte, 9201 University City Boulevard, Charlotte, NC 28223-0001, Phone: (704) 687-7902, Email: vjohns07@uncc.edu

Research Objective: Enacted in 1986 to address the problem of patient dumping, the Emergency Medical Treatment and Active Labor Act (EMTALA) prohibits discrimination in access to emergency care based on race, ethnicity, or ability to pay. This study investigates whether there are racial/ethnic or payer differences in access to emergency care in a nationally representative sample of the general adult population in the U.S.
Study Design: This study uses data from the 2003-2004 National Hospital Ambulatory Medical Care Survey. Adults who presented to an ED with chest pain as one of the presenting complaints are included in the study sample. Independent variables of interest are race/ethnicity (non-Hispanic white versus others,

or "minorities") and expected payer source (Medicare, private or other insurance versus Medicaid/SCHIP and self pay or unknown payer). We consider two dichotomous outcomes: whether a patient waited for more than 60 minutes to see a physician and whether a patient was transferred given that hospitalization was required. We conduct a logistic regression for each of the two outcomes, controlling for demographic factors (age and gender), perceived patient severity (measured by presenting level of pain, mode of arrival, and chest pain as the primary complaint) and ED demand fluctuations (proxied by the patient's arrival time). We further control for ED fixed effects to estimate racial/ethnic and payer differences within EDs.
Population Studied: The study uses a nationally representative sample of U.S. ED visits. The study sample is restricted to a high-volume chief complaint that warrants emergency care, i.e. chest pain. Patients residing in a nursing home or other institution are excluded.
Principle Findings: Results of the adjusted analysis indicate that, within the same ED, racial/ethnic minorities were more likely, compared to non-Hispanic whites, to have waited for more than 60 minutes (relative risk ratio=1.35, s.e.= 0.005). Medicaid/SCHIP patients and self pay/unknown payer patients were more likely, compared to those with Medicare, private or other insurance, to have waited for more than 60 minutes (RR=1.20, s.e.= 0.003 and RR=1.36, s.e.= 0.005 respectively). Among patients for whom hospitalization was required, racial/ethnic minorities were less likely to be transferred (RR=0.53, s.e.=0.008) than non-Hispanic whites while Medicaid/SCHIP patients and self pay/unknown payer patients were more likely to be transferred (RR=2.14, s.e.= 0.04 and RR=1.92, s.e.=0.03 respectively) than those with Medicare, private or other insurance.
Conclusions: Despite the existence of federal legislation to ensure universal and equal access to emergency care, racial/ethnic and payer disparities persist within EDs among patients presenting with chest pain. Provider stereotyping, economic interests and patient preferences may have contributed to the observed differences. Further research is needed to explore the factors contributing to disparities and to evaluate whether the observed disparities in the timeliness of emergency care extend to differences in clinical care processes and outcomes.
Implications for Policy, Practice or Delivery: Study findings suggest that the policy intent of EMTALA is not being met. As the number of uninsured Americans rises, ED utilization continues to increase and the crisis in emergency care mounts, it is important to understand both provider- and patient-level barriers in access to the emergency care safety net.

- Capped Benefits & Prescription Drug Use by Low Income Seniors: Exploiting Panel Data

Christine Bishop, Ph.D., Andrew Ryan, M.A., Daniel Gilden, M.S., Joanna Kubisiak, M.P.H., Cindy Parks Thomas, Ph.D.

Presented By: Christine Bishop, Ph.D., Professor, Heller School for Policy and Management, Brandeis University, Mailstop 035/410 South Street, Waltham, MA 02454-9110, Phone: (781) 736-3942, Email: bishop@brandeis.edu

Research Objective: To investigate the impact on near-poor elders' access to prescription drugs of an increase in out-of-pocket copayment required by the cap provision in a state pharmacy assistance plan.
Study Design: Illinois SeniorCare enrollees reaching a $1750 "soft cap" faced an increase in copayment from $1/$4 for generic and brand drugs to 20% of cost. The analysis used a retrospective cohort design to estimate the impact of this out-of-pocket price increase on dependent variables representing monthly number of prescriptions, prescription expense, and proportion prescriptions that were generic. Hitting the cap depends on an enrollee's past expenditures, introducing endogeneity into the estimation of the effect of the cap on the dependent variables. To address this issue we estimated a first difference model and instrumented the cap effect with lags of drug expenditure using generalized method of moments estimation (GMM).
Population Studied: Enrollees in Illinois SeniorCare in its first year of operation, June 2003 through June 2004. Enrollees were aged 65 and older, had incomes less than two times the federal poverty level, but were not enrolled in Medicaid.
Principle Findings: The estimated first difference model that accounts for endogeneity of cap status revealed an average impact on expenditures due to hitting the cap of -$144, almost 50% of mean pre-cap expenditures; in response to hitting the cap, monthly number of prescriptions fell 44%, and percentage of prescriptions that were generic increased 13.5%,

a five percentage point increase in the percent generic. A first difference analysis that did not account for the endogeneity of the cap found a much lower impact for hitting the cap, suggesting that previous analyses may have underestimated the impact of an increase in copay due to an expenditure cap.
Conclusions: Near-poor elders in a pharmacy insurance plan with a cap responded to the cap's increase in price by substantially reducing expenditures. They did this through large reductions in the number of prescriptions they filled each month and relatively small increases in the proportion of those that were generic rather than brand-name drugs.
Implications for Policy, Practice or Delivery: Out-of-pocket payments in the range of 20% of drug price can have a large impact on near-poor elders' access to prescription drugs. Medicare Part D enrollees with income above 135% of poverty face initial copays that are similar to the 20% copay for Illinois SeniorCare who hit their cap; and standard Part D plan design calls for enrollees to pay 100% of price after a cap is hit. Evaluations of the impact of Part D on access to prescription drugs, and health status, should pay special attention to effects for near-poor elderly populations.
Most previous analyses of the impact of benefit design on access/utilization of health services have not had access to data on monthly expenditures after an expenditure cap is hit; and analysis must account appropriately for the endogeneity of hitting the cap, i.e. its dependence on past expenditures, and on clustering of monthly data on individuals. Our results suggest that previous analyses may have underestimated the impact of an increase in copayments due to hitting a cap and support the position from a recent review conducted by Gruber (2006) that "the evidence is clear, at least in the case of prescription drugs, that such caps do more harm than good."
Funding Source: RWJF, CMS

Disparities

Cultural Competence as a Strategy to Improve Quality & Eliminate Disparities

Chair: Joseph Bentancourt, M.D., M.P.H.

Sunday, June 3 • 5:00 p.m.-6:30 p.m.

▪ Latina Patient Perspectives about Informed Decision Making for Surgical Breast Cancer Treatment

Sarah Hawley, Ph.D., M.P.H., Nancy Janz, Ph.D., Ann Hamilton, Ph.D., Steven Katz, M.D., M.P.H.

Presented By: Sarah Hawley, Ph.D., M.P.H., Assistant Professor, Internal Medicine, University of Michigan and VAMC, 300 N. Ingalls Room 7C27, Ann Arbor, MI 48109, Phone: (734) 936-4787, Fax: (734) 936-8944, Email: sarahawl@med.umich.edu

Research Objective: To evaluate Latina breast cancer patients' perspectives regarding their decisional involvement and degree of informed decision making for surgical breast cancer treatment.
Study Design: A cross sectional survey of breast cancer patients who were identified and mailed a survey shortly after receipt of surgical treatment. Latina and African American women were over-sampled. Survey data were merged to SEER data. We report results on a 50% respondent sample (N=742) which will be updated based on a final respondent sample of 1400 patients (projected response rate, 72%). Dependent variables were patient reports of: 1) how decisions were made (doctor-based, shared, patient-based); 2) their preferred amount of decisional involvement (wanted less, just right, wanted more); 3) a 5-item scale measuring informed decision making and satisfaction; and 4) a 5-item scale measuring decision regret. Race/ethnicity was categorized into white, African American (AA), Latina-English speaking (L-E) and Latina-Spanish speaking (L-SP).
Population Studied: 2030 women (Latina, African American and white) with non-metastatic breast cancer diagnosed from 8/05-5/06 and reported to the Los Angeles County SEER registry.
Principle Findings: 32% of women were white, 28% African American (AA), 20% Latina-English speaking (L-E), and 20% Latina-Spanish speaking (L-SP). About 28% of women in each ethnic group reported a surgeon-based, 33% a shared, and 38% a patient-based surgical treatment decision. L-SP women reported wanting more involvement in decision making more often than white, AA or L-E women (16% vs. 4%, 5%, 5%, respectively, $p<0.001$). All minority groups were less likely than white women to have high levels of decisional satisfaction with L-SP women having the lowest satisfaction (w-74%, AA-63%, L-E-56%, L-SP-31%, $p<0.001$). L-SP women were more likely than

white, AA or L-E women to report having decision regret (35% vs. 7%, 15%, 16%, respectively, p<0.001). Multivariate regression showed that Latina ethnicity and low literacy were independently associated with both low decisional satisfaction and high decision regret (p<0.001).
Conclusions: Latina women, especially those who prefer Spanish, report more dissatisfaction with the breast cancer surgical treatment decision-making process compared to other racial/ethnic groups. These results suggest that there are challenges to improving breast cancer treatment informed decision making for Latina women.
Implications for Policy, Practice or Delivery: Increasing decisional involvement and informed decision making has been identified as a mechanism for reducing health disparities and improving quality care for minority populations. Future interventions to improve satisfaction with the decision process are needed, and should be tailored to ethnicity and degree of acculturation.
Funding Source: NCI

- **The Impact of English Proficiency on Disparities of Healthcare Services**

Eric Cheng, M.D., M.S., Alex Chen, M.D., M.S., William Cunningham, M.D., M.P.H.

Presented By: Eric Cheng, M.D., M.S., Neurology, VA GLA Healthcare System, 11301 Wilshire Boulevard, Los Angeles, CA 90073, Phone: (310) 478-3711 x-48100, Fax: (301) 268-3044, Email: eric.cheng@va.gov

Research Objective: Disparities in healthcare services between Hispanics and Whites in the United States are well documented. We investigated the degree that English language proficiency explains disparities in recommended healthcare services.
Study Design: Cross-sectional, nationally representative survey of noninstitutionalized adults. We compared receipt of ten recommended healthcare services by ethnicity and by English language proficiency, adjusting for sociodemographic, health status, and access to care characteristics. The results were weighted to give estimates of the United States civilian population.
Population Studied: Non-Hispanic White and Hispanic adults included in the 2003 Medical Expenditure Panel Survey. The sample included 12706 Whites and 5500 Hispanics.
Principle Findings: In bivariate comparisons, 57.0% of Whites received all eligible healthcare services compared to 53.6% for Hispanics who spoke English at home, 44.9% for Hispanics who did not speak English at home but who were English proficient, and 35.0% for Hispanics with limited English proficiency (p<0.001). In multivariate logistic models, compared to non-Hispanic Whites, Hispanics who did not speak English at home were less likely to receive all eligible services, whether they were proficient in English (RR 0.86, 95%CI [0.74 to 0.95]) or had limited English proficiency (RR 0.83, 95% CI [0.68 to 0.94]).
Conclusions: The language spoken at home explained disparities in healthcare among Hispanics. Speaking a language other than English at home identified a vulnerable group for receipt of recommend healthcare services, whether they are English proficient or not.
Implications for Policy, Practice or Delivery: Addressing the barriers imposed by limited English proficiency may reduce disparities and improve care among Hispanics in the United States.
Funding Source: Project EXPORT

- **Race, Health Literacy, and HIV Medication Adherence**

Chandra Y. Osborn, Ph.D., Michael Paasche-Orlow, M.D., Terry C. Davis, Ph.D., Michael S. Wolf, Ph.D., M.P.H.

Presented By: Chandra Y. Osborn, Ph.D., Health Services Research Fellow, Institute for Healthcare Studies, Northwestern University, Feinberg School of Medicine, 676 N. St. Clair Street, Suite 200, Chicago, IL 60611, Phone: (312) 695-6956, Fax: (312) 695-4307, Email: c-osborn@northwestern.edu

Research Objective: Health literacy may be a mediating factor explaining noted racial disparities in HIV medication adherence. Previous studies examining chronic disease self-management have shown that African American adults often possess a poorer understanding of prescribed medications, and are more likely to be non-adherent to their regimens. The objective of this study was to examine the mediating effect of health literacy on the relationship between race and HIV medication adherence.
Study Design: We recruited patients who were HIV-infected, prescribed >1 antiretroviral medication, and receiving outpatient care at infectious disease clinics at Northwestern Memorial Hospital (Chicago, IL) and the Louisiana State University Health Sciences Center (Shreveport, LA). Structured in-person

interviews were conducted in a private room at each respective clinic immediately prior to patients' scheduled physician visits. Information gathered pertained to patient demographics, medication adherence, and health literacy.
Population Studied: There were 204 patients in the study (age, M= 40.1, SD=9.2): 80% were male, 45% were African-American, 60% were unemployed, 40% had household incomes <$800/month, 28% carried no health insurance, over 60% reported at least some college education, and over 70% were taking three or more HIV medications. More than half (53%) of all patients were also receiving treatment for a non-HIV related chronic illness. Approximately one third of patients had limited literacy skills.
Principle Findings: Multivariate regression models were analyzed to examine the associations between race, health literacy, and HIV medication adherence after adjusting for relevant covariates. African Americans were 2.40 (95% confidence interval, 1.14-5.08; C-statistic = 0.67) times more likely to be non-adherent to their HIV medication regimen than Whites. When literacy was included in the model, the effect estimates of African-American race diminished (25%) to a point of non-significance (Adjusted Odds Ratio (AOR) 1.80, 95% 0.51 to 5.85; C-statistic = 0.72). Literacy remained a significant independent predictor of adherence (AOR 2.12, 95% 1.93 to 2.32).
Conclusions: In our study, African American race was a significant predictor of HIV medication non-adherence. However, the inclusion of health literacy in the model reduced the explanatory power of race, such that low literacy, and not race, was independently associated with HIV medication non-adherence.
Implications for Policy, Practice or Delivery: Our findings highlight the importance of acknowledging health literacy barriers when attempting to understand health disparities, and in developing efficacious strategies to reduce these differences. The development of educational interventions for medication management that are both appropriate for lower literate audiences and culturally sensitive may both improve HIV medication adherence, and reduce racial/ethnic differences in outcomes.
Funding Source: CDC

- Men's Health: Disparities in health self advocacy

Keith Elder, Ph.D., M.P.H., M.P.A., Jacqueline Wiltshire, Ph.D., M.P.H., Velma Roberts, Ph.D., Lisa Gary, Ph.D., M.P.H., M.S., Dayna Campbell, M.P.H., Ph.D.

Presented By: Keith Elder, Ph.D., M.P.H., M.P.A., Assistant Professor, Health Services Policy and Management, University of South Carolina School of Public Health, 800 Sumter Street Room 116, Columbia, SC 29208, Phone: (803) 777-5041, Fax: (803) 777-1836, Email: kelder@gwm.sc.edu

Research Objective: The term crisis has been used to characterize the markedly elevated rates of morbidity, disability, and mortality of minority men compared with their White counterparts. Predictors of health promoting behaviors in minority men are little understood. The literature is replete with evidence that those who participate in and self advocate (seek health information and use information to enhance their health) have better health outcomes. This study aimed to identify the factors influencing health information seeking and using that health information in the medical encounter.
Study Design: This study used data from the 2000-2001 Household Component of the Community Tracking Survey. We examined the impact of race/ethnicity, health insurance status, health insurance type, perceived health status, marital status, educational status, poverty level, rurality, usual source of care, employment status, and age, on the likelihood of seeking health information and self advocacy (mentioned health information to doctor and doctor ordered tests based on health information presented). Binomial logit models were used to examine the predictors of self advocacy.
Population Studied: The study sample included 14527 men ages 18 to 65 with at least 1 physician visit in the previous year.
Principle Findings: Compared to White men, Hispanic and African American men were slightly more likely to seek health information (OR 1.05) and (OR 1.13). African American (oR .59) and Hispanic (OR .85) men were less likely to mention health information to a physician during the medical encounter than white men. Among those men who sought health information and mentioned that information to a physician, African American (OR 1.32) and Hispanic men (OR 3.57) were more likely to perceive that tests were ordered based upon health information mentioned to the physician than white men. Marital status, educational level, employment status, age, and health status were significant predictors of seeking health information. Educational level, poverty level, employment status, usual source of care, age, health status, and HMO enrollee were significant predictors of mentioning health information to a

doctor. Marital status, poverty level, and HMO enrollee were significant predictors for perceiving test was ordered based on health information.
Conclusions: Minority men were more likely than white men to seek health information, but they were less likely to mention that information to their doctor. However, minority men were more likely than white men to perceive a test was ordered based on health information presented during the medical encounter.
Implications for Policy, Practice or Delivery: Policy initiatives to facilitate minority men's health self advocacy could greatly impact health disparities, because of the documented impact of health self advocacy. Qualitative research is needed to explore the options to improve minority men's self advocacy and to explore minority men's perceptions that tests were ordered based on health information.

- **Do Safety Net Clinics Reduce Ethnic Enclave Risk in Cancer Screening?**

Ninez Ponce, M.P.P., Ph.D., Melissa Gatchell, M.P.H., Kristina Cordasco, M.D., M.P.H.

Presented By: Ninez Ponce, M.P.P., Ph.D., Assistant Professor, Health Services, UCLA School of Public Health, 31-254B Center for the Health Sciences, Los Angeles, CA 90290, Phone: (310) 206-4021, Email: nponce@ucla.edu

Research Objective: Individuals living in racially-concordant ethnic enclaves may benefit from the amenities of familiar cultural and linguistic goods and services, and ethnically-bound neighborhood social capital that may lower healthcare transaction costs. However, ethnic enclaves may suffer from concentrated economic disadvantage such as high rates of poverty, unemployment and limited English language skills that may contextually abate an individual's access to healthcare. In previous work, we found that ethnic enclaves are associated with lower rates of cancer screening: higher Latino concentration conferred a considerable penalty in receipt of endoscopies (OR 0.04; p-value =.014). Higher Asian concentration significantly predicted lower odds of cervical cancer screening among Asians (OR: 0.53, p-value: 0.045). In this study, we explored whether proximity of at least one safety net clinic in the individual's neighborhood modifies this enclave risk.
Study Design: Using a multilevel conceptual framework, we estimated 2-level random effects logit models, stratified by race/ethnicity, on the likelihood of receipt of 1) Pap tests, 2) mammograms, and 3) endoscopies for colorectal cancer at age-appropriate recommended intervals. At the census tract level we measured racial/ethnic concentration, social capital, neighborhood tenure, %population living below poverty, %non-citizen, and %limited English proficient; at the metropolitan-area level, we included HMO penetration, HMO competition, and %staff/group model HMO. We adjusted for individual characteristics: age, gender, household income, education, family composition, years lived in the US, citizenship, English proficiency, neighborhood tenure, social capital, discrimination in medical care, usual source of care, and health insurance coverage. To estimate how safety net placement modifies enclave risk, we developed a list of primary care safety net clinics serving adults throughout the state and geocoded address and census tract information of each safety net clinic to the CHIS 2003 individual-level data. We re-estimated our models stratifying the sample into two groups: tracts with one or more safety net clinics, and tracts with no safety net clinics.
Population Studied: We examined adults residing in metropolitan areas from the 2003 California Health Interview Survey (n=37,139). Area-level data was obtained from the 2000 US Census, Interstudy 1999-2000, and data we collected from various sources on primary care safety net clinics serving adults.
Principle Findings: In comparing areas with and without safety net clinics, we found that the Latino enclave risk in receipt of endoscopies was greater in areas that lacked a safety net clinic, whereas there was a positive, though not significant effect of enclave risk in areas with at least one safety net clinic. Similarly, we found no Asian enclave risk in Pap tests in areas with one or more safety net clinics, but found that enclave risk persisted (Odds Ratio 0.54; p=.08) in areas without a safety net clinic.
Conclusions: Gains can be made in reducing cancer screening disparities if cancer control programs focus on high-density Asian and Latino neighborhoods. Placement of safety net clinics in these Asian and Latino neighborhoods appear to reduce enclave risk.
Implications for Policy, Practice or Delivery: To reduce disparities in cancer screening, policymakers need to examine how ethnic enclave communities influence consumer demand for preventive cancer tests, and evaluate whether investment and placement decisions regarding safety net clinics may potentially reduce enclave risk not just in cancer disparities but in other chronic conditions.

Funding Source: NCI

Patient-Provider Relationships & Health Care Disparities

Chair: Allyson Hall

Monday, June 4 • 9:00 a.m.-10:30 p.m.

▪ The Effects of Discrimination and Distrust on Racial/Ethnic Disparities in Antiretroviral Therapy Adherence by HIV+ Patients

Angela Thrasher, Ph.D., M.P.H., Jo Anne Earp, Sc.D., Cathy Zimmer, Ph.D., Carol Golin, M.D.

Presented By: Angela Thrasher, Ph.D., M.P.H., Postdoctoral Fellow, Center on Social Disparities in Health, University of California, San Francisco, 500 Parnassus Avenue, MU-3E, San Francisco, CA 94143, Phone: (415) 476-6839, Fax: (415) 476-6051, Email: thrashera@fcm.ucsf.edu

Research Objective: Because of experiences and expectations of racism in healthcare, racial/ethnic minority patients may be more likely than white patients to perceive unfair treatment by health professionals (discriminatory healthcare experiences) and have lower expectations that providers will act in their best interests (healthcare provider distrust). These factors, in turn, may influence patients' treatment-related attitudes, beliefs, and adherence. The present study examined the effects of racial/ethnic minority status, discriminatory healthcare experiences, and healthcare provider distrust on antiretroviral therapy adherence by HIV+ patients, a critical behavioral outcome that often varies by racial/ethnic minority status.

Study Design: This secondary analysis used data from the HIV Cost and Services Utilization Study, a nationally representative longitudinal study of HIV+ patients. Factor analysis was used to develop the study measures, all of which demonstrated good internal consistency. The dependent variable was antiretroviral therapy adherence. The independent variable was racial/ethnic minority status (crude proxy for past experiences and expectations of racism in healthcare). Hypothesized mediators were discriminatory healthcare experiences, healthcare provider distrust, and antiretroviral therapy attitudes and beliefs. The proposed model, including established antiretroviral therapy adherence covariates, was tested using structural equation modeling.

Population Studied: The study sample was the 1911 participants who completed all three waves of data collection and were prescribed antiretroviral therapy (49% White, 33% Black, 15% Hispanic, 3% other racial/ethnic group).

Principle Findings: Minority participants were less likely to report perfect adherence than white participants (40% vs. 50%, $p < .001$). Almost half (41%) the participants reported ever experiencing discrimination in healthcare settings, while few participants reported distrust of their healthcare providers. In the full structural equation model ($R2 = .49$, $X2 = 40.48$, $df = 12$, $p < .001$), the direct effect of minority status on adherence remained despite the presence of hypothesized mediators ($b = -.21$, $p < .05$). The magnitude of indirect effects was negligible, and their sum was not statistically significant. Discrimination's effect on adherence was entirely indirect via greater distrust and weaker medication efficacy beliefs. Greater distrust was unexpectedly associated with better adherence ($b = .06$, $p < .05$). Distrust indirectly affected adherence via greater psychological distress about taking antiretroviral therapy and weaker medication efficacy beliefs.

Conclusions: The relationship between racial/ethnic minority status and antiretroviral therapy adherence was not explained by patient-level sociodemographic, health, or psychosocial factors. Both discrimination and distrust may indirectly affect adherence by strengthening negative attitudes and beliefs about antiretroviral therapy. Future research will consider an alternative model where the hypothesized relationships vary by racial/ethnic minority status, suggesting different socioenvironmental contexts in which antiretroviral therapy adherence occurs.

Implications for Policy, Practice or Delivery: Patients who are members of one or more stigmatized groups (e.g., HIV+, racial/ethnic minority, same-sex orientation) may have experienced discrimination in healthcare settings which could subtly color their perspectives about their current healthcare providers and recommended treatments. Patient-centered healthcare providers must manage a delicate balance between individual patients' beliefs, needs, and choices and understanding the social context in which those circumstances occur.

Funding Source: Other Govt, National Institute of Allergies and Infectious Diseases

- **Disparities in Access to Care and Health Care Utilization: Does Patient-Provider Race/Ethnicity Mix Matter?**

Sangho Moon, Ph.D., Jaeun Shin, Ph.D.

Presented By: Sangho Moon, Ph.D., Associate professor, Graduate School of Governance, Sungkyunkwan University, 3-53 Myeongryun-dong, Chongno-Gu, Seoul, 110-745, South Korea, Phone: (822) 760-0367, Fax: (822) 32991129, Email: smoon@skku.edu

Research Objective: Racial/ethnic disparities in access to care and health care utilization are well documented. Health insurance status and socioeconomic characteristics are often known to produce barriers to care and use of health care services among racial minorities. However, these factors do not fully explain racial disparities. Previous research has raised the possibility that provider-patient race/ethnicity mix may cause this disparity, but few studies examine this issue empirically. The purpose of this study is to understand differences in access to care and health care utilization between individuals with providers of identical race/ethnicity and those with providers of different race/ethnicity, and to assess the health policy implications for reducing racial/ethnic disparities in the health care provision.
Study Design: Race/ethnicity mix is identified for respondents of all ages in the 2002 Medical Expenditure Panel Survey (MEPS) and their usual source of care (USC) provider. The access-to-care attributes are measured by various indiators for the confidence in and satisfaction with the USC provider. Utilizations of health care are measured for office-based service, hospital outpatient and inpatient services use, ambulatory care use, dental service use, home health service use and prescription drug use. Statistical significance of the differences in means is performed using t-tests.
Population Studied: A sample of all ages from the 2002 Medical Expenditure Panel Survey (MEPS)are selected for the study, who identify their race/ethnicity, USC provider, and the race/ethnicity of the provider.
The respondents are categorized into two groups, identical race/ethnicity mix (I-group) versus and discordant mix (D-group) for comparison.
Principle Findings: Relative to D-group, I-group is significantly more likely to have confidence in the USC provider and more likely to be satisfied with USC. I-group has no significantly stronger tendency to use more of hospital outpatient service. While I-group is found to use less of hospital inpatient service, emergency room service, and home health services, they make more visits to office-based service, dental service, and refill prescription drugs more often.
Conclusions: This study provides preliminary evidence that diverse race/ethnicity provider-patient mix may produce barriers to care, which are realized as weak confidence in and low satisfaction with the provider. With the identical provider-patient race/ethnicity mix, individuals may use more health care services in the settings where the provision of medical treatments involves the direct interaction between the provider and patients, such as office-based services, dental service and drug prescription service. Higher use of ambulatory service and hospital inpatient services of D-group may be contributed by the delayed delivery of necessary medical care. The reluctance of patients to encounter the provider due to the cultural discomfort in personal interaction may lead to lack of the usual source of care, consequently forcing the patients to depend on intensive and emergent care. Also, the potential perceived racism on the provider side against patients from different cultural background may possibly be the reason for the disparity in health care.
Implications for Policy, Practice or Delivery: Policy makers can use results from this study in developing and improving health care provision environments to reduce racial/ethnic disparity in access to care and health care utilization. Further research should pay attention to examine the influence of provider-patient race/ethnicity mix on the health outcomes of patients.

- **Physician-Level Performance and Racial Disparities in Diabetes Care**

Thomas Sequist, M.D., M.P.H., Garret Fitzmaurice, Sc.D., Richard Marshall, M.D., Shimon Shaykevich, B.S., Dana Safran, Sc.D., John Ayanian, M.D., M.P.P.

Presented By: Thomas Sequist, M.D., M.P.H., Assistant Professor of Medicine and Health Care Policy, Division of General Medicine, Brigham and Women's Hospital, 1620 Tremont Street, Boston, MA 02120, Phone: (617) 525-7509, Fax: (617) 732-7072, Email: tsequist@partners.org

Research Objective: Racial disparities in diabetes care are well documented, however little information is available regarding the importance of individual physician performance. We analyzed variation in disparities in diabetes care to quantify the contributions of patient

characteristics and individual physicians to population-level differences in care.
Study Design: We used electronic medical record data to identify primary physicians caring for at least 5 white and 5 black adults with diabetes during 2005 within a large multisite group practice in Massachusetts. We assessed rates of optimal control of HbA1c (<7.0%), LDL cholesterol (<100 mg/dL), and blood pressure (<130/80 mmHg). We fit hierarchical linear regression models to 1) measure population-level disparities in diabetes care (base model); 2) adjust disparities for patient characteristics including age, sex, income, and insurance status (patient model); 3) adjust disparities for patient characteristics and health center and physician effects (physician model); and 4) measure adjusted disparities within individual physician panels.
Population Studied: We identified 85 eligible physicians caring for 5,463 patients (62% white, 38% black) across 13 health centers. The median number of white patients per physician was 38 (interquartile range (IQR) 20 to 53, maximum 124) and of black patients was 13 (IQR 8 to 32, maximum 112). There was substantial clustering of care for black patients, with 39% of physicians caring for 75% of black patients.
Principle Findings: White patients were significantly more likely than black patients to achieve optimal control of HbA1c (40.9% vs 31.8%), LDL cholesterol (47.5% vs 37.3%), and blood pressure (36.0% vs 29.4%, all p<0.001). Adjustment for patient characteristics in the patient model reduced the baseline white-black differences in HbA1c control from 9.1% to 7.7%, and LDL cholesterol control from 10.2% to 6.8%; while white-black differences in blood pressure control increased from 6.6% to 8.2%. Additional adjustment for clinical center and physician effects in the physician model only slightly further decreased white-black differences in HbA1c from 7.7% to 7.3%, and LDL cholesterol control from 6.8% to 5.7%; while white black-differences in blood pressure control increased slightly from 8.2% to 8.5%. Adjusted white-black differences in control rates varied substantially between physician panels for HbA1c (IQR 5.3% to 9.5%), LDL cholesterol (IQR 2.5% to 8.9%), and blood pressure (IQR 7.7% to 10.0%). There was no association between the magnitude of disparity and number of black patients treated within a physician panel for any of the 3 measures.
Conclusions: Racial disparities in diabetes care are mainly related to patient characteristics and within-physician differences, with little effect due to between-physician differences and no relation to the number of blacks treated by individual physicians.
Implications for Policy, Practice or Delivery: Targeting physicians with lower performance or shifting black patients care to physicians who provide more equal care would have a limited impact on disparities. More systemic efforts to improve care for black patients across all physicians will be required.
Funding Source: RWJF

- **Differences in the Quality of the Patient-Physician Relationship among Terminally Ill African American and White Patients: Impact on Advance Care Planning and Goals of Care**

Alexander Smith, M.D., M.S., Roger B. Davis, Sc.D., Eric L. Krakauer, M.D., Ph.D.

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Research Objective: Little is known about the quality of the patient-physician relationship among African American and white patients with terminal illness and its impact on differences in advance care planning and goals of care.
Study Design: Cross sectional survey of terminally ill patients. We first examined differences between African American and white patients in 6 patient reported patient-physician relationship quality measures: trust, feeling respected, feeling that decision making is shared, and perceived physician skill in breaking bad news, listening, and helping with the medical system. We then describe differences between terminally ill African Americans and whites in presence of an advance care plan and goal of "prolong life however possible," first in unadjusted models, then in multivariable models adjusting for age, gender, education, disease, and measures of the quality of the patient-physician relationship. We additionally present the results of subgroup analyses of end-of-life outcomes from interviews with 552 patients who survived to follow up and responses from caregivers for 191 patients who died before the follow up interview.
Population Studied: We analyzed data from in-person surveys of 803 African American and white patients with an estimated survival of six months. Patients were referred from randomly

selected physicians in 5 metropolitan areas and 1 rural county.
Principle Findings: Of 803 terminally ill patients, 688 were white and 115 were African American. The mean age of patients was 65.9 (standard deviation 13.3), and the most common diagnoses were cancer (52.9%), heart disease (17.4%), and chronic obstructive pulmonary disease (11.5%). Twenty-nine percent of patients died between the first and follow up interviews (mean time to follow up interview, 125 days). The reported quality of the patient-physician relationship was significantly lower for African Americans than for white patients for all measures except trust, which was of borderline statistical significance (p=.08). African Americans were less likely to have an advance care plan (42.6% vs. 77.3%, p<.001), and more likely to report a goal of "prolong life however possible" (57.4% vs. 20.0%, p<.001). Only 21.1% of African American and 25.9% of white patients had talked with their physician about plans for care near the end-of-life (p=.29). In multivariable analysis, substantial differences between African Americans and whites in advance care planning and goals of care remained after adjusting. In a subgroup analysis of patients who survived to a second interview, African American patients were more likely to feel abandoned by their physician (11.8% vs. 3.6%, p=.005), and interviews with decedents´ caregivers revealed that African Americans were more likely to have died in the hospital (57.7% vs. 31.1%, p=.008), without a Do Not Resuscitate order (57.1% vs. 79.7%, p=.02), and less likely to have used hospice (38.5% vs. 60.1%, p=.04).
Conclusions: Terminally ill African Americans report lower quality interactions with their physicians than terminally ill white patients. However, quality of the relationship does not explain the observed differences between African Americans and whites in advance care planning and goals for end-of-life care.
Implications for Policy, Practice or Delivery: Physicians in our study referred patients based on an estimated prognosis of 6 months to live, yet, remarkably few patients reported discussing plans for care near the end-of-life with their physician.
Funding Source: CWF

▪ **Availability of Multilingual Prescription Medication Information for Limited English Proficient Patients in New York Pharmacies.**
Olveen Carrasquillo, M.D., M.P.H., Iman Sharif, M.D., Francesca Gany, M.D.

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Research Objective: As the foreign born population in the US continues to increase, the quality of care provided to patients who are limited English proficient (LEP) has come under increased scrutiny. While much of the existing research has focused on doctor-patient communication, less is known about interactions between pharmacists and LEP patients.
Study Design: As part of a wider initiative focused on improving the availability of multilingual prescription medication information, we conducted a cross-sectional phone survey of 200 New York City (NYC) pharmacies. We used a randomized list of all licensed pharmacies in NYC (2,186). Pharmacies were excluded if they lacked an identifiable working phone (N=44), did not serve outpatients (N=20), or pharmacists were unable to complete the survey (N=62, e.g. refusal, attempts at up to 5 call backs unsuccessful). Once excluded, we contacted the next pharmacy on the list until 200 phone interviews were completed. The survey was developed through a process that involved a review of existing pharmacist phone surveys and input from an Advisory Board, including practicing pharmacists and pharmacist educators. Anticipating that characteristics at multiple levels would be associated with the provision of information to LEP patients, the survey included questions on pharmacy, pharmacist and patient characteristics. Based on pilot testing, we shortened the survey to one that took under 5 minutes for pharmacists to complete. The primary outcomes were frequency of medication label translation (dichotomous: daily vs. not daily), translated medication information sheets, and availability of bilingual staff for counseling. Survey responses were geo-coded and merged with census tract level data on proportion of LEP persons. We used multivariate analysis to identify characteristics independently associated with providing translated medication labels.
Principle Findings: Most pharmacists (88%) reported that they served LEP patients on a daily basis. Among the 176 pharmacies serving LEP patients on a daily basis, 80% noted they could provide translated labels and 52% could provide translated patient information sheets. Despite these capabilities, only 39% reported translating

labels on a daily basis and 23% never translated labels. Spanish was the most common language for translated labels (72%) followed by Chinese (12%). Although 75% of the pharmacies had staff to provide medication counseling to Spanish speaking LEP patients, less than a quarter were pharmacists or pharmacy interns as legally required. In multivariate analysis, there was an increased odds of daily label translation for independent versus chain pharmacies (OR= 4.08, 95%CI, 1.55-10.74) and with increasing proportion of Spanish-speaking LEP persons in the pharmacy?s census tract (OR = 1.09, CI 1.05-1.13 for each 1% increase in Spanish LEP population).
Implications for Policy, Practice or Delivery: Our study identifies a major gap in the provision of health care services for LEP patients that warrants immediate attention. Although not optimal, use of widely available label translation software is a simple and feasible initial step. Clinicians can serve an important role by reviewing medication labels and reminding LEP patients to request translated labels. The provision of pharmacy counseling services for LEP patients may require more complex interventions. Lastly, given the sharp reduction in independent pharmacies, our findings on language access at chain pharmacies raise additional concerns.
Funding Source: NY Academy of Medicine

Advancing Methods for Studying Healthcare Disparities

Chair: Paul Hebert, Ph.D.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ Using the Kalman Filter to Improve Disparity Estimates for Rare Racial/Ethnic Minorities: An Application to American Indians / Alaska Natives and Chinese Americans using the National Health Interview Survey

Daniel McCaffrey, Ph.D., Daniel McCaffrey, Ph.D., David Klein, M.S., Brian K. Finch, Ph.D., Nicole Lurie, M.D., M.S.P.H.

Presented By: Daniel McCaffrey, Ph.D., Senior Statistician, Economics and Statistics, RAND, 4570 5th Avenue, Pittsburgh, PA 15213, Phone: (412) 683-2300 x4919,
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Research Objective: To develop and evaluate models for efficiently pooling repeated cross-sectional data over time to improve measurement of health disparities that may affect smaller racial/ethnic groups (<1% of the US), such as Chinese and American Indians/Alaska Natives (AI/AN).
Study Design: We compare (1) single-year estimates (current-year mean) , (2) simple unweighted pooling over eight years of data (eight-year mean), and (3) a modified Kalman Filter (MKF) in terms of their expected mean square error (MSE) in estimating National Health Interview Survey (NHIS) Adult Sample outcomes for small target groups (Chinese and AI/AN, each constituting about 200 of 32,000 annual observations) in the last year of an 8-year (1997-2004) series. This was the longest recent series for which outcomes and relevant racial/ethnic identifiers were available in a consistent form. Approach (3) detrends linearly then weights past years as a function of the autocorrelation and exogenous variance at the group-year level.
Population Studied: Community-dwelling US adults, emphasizing those who self-identify as Chinese or AI/AN.
Principle Findings: Current-year estimates were quite imprecise for the 18 outcomes examined, with relative standard errors exceeding the NCHS 30% upper bound for usability. The performance of approaches (2) and (3) relative to (1) was better with lower annual sample size and group-year variance. Additionally, the performance of (2) relative to (1) was better with (absolutely) smaller linear trends in the outcome, since such trends bias (2), but not (1) and (3). The MSE was better for (2) than for (1) for 16 of 18 outcomes. In the median case, unweighted pooling of 8 years of data for Chinese would improve the accuracy (MSE) of estimates equivalently to tripling the effective sample size (ESS), but these would range from multiplying ESS by 6 to dividing it by 6.
The MKF improved MSE relative to (1) for all Chinese outcomes, with the median equivalent to more than doubling ESS. The MKF has an upper bound on improvement (here 2.4X ESS) as a function of parameters it must estimate, which allows (2) to outperform (3) under circumstances well suited to (2).
Conclusions: Efficient use of existing data for small groups is essential. Simple unweighted pooling may substantially improve the precision of current year health estimates for small racial/ethnic groups, but also risks worsening accuracy for outcomes with strong trends. The MKF makes small to substantial improvements for all outcomes, but does not fully take

advantage of the most stable outcomes. A branching algorithm that began with the MKF and switched to unweighted pooling when it had a better MSE would improve accuracy for all examined measures for Chinese, tripling ESS in the median case and multiplying it by six in the best case.
Implications for Policy, Practice or Delivery: The joint MKF/pooling algorithm is a low-cost means of substantially improving the measurement of current national health for smaller groups. These gains, which vary by outcome, can be combined with changes in design for greater gains still, although combined gains would be less than fully multiplicative. Longitudinal continuity of racial/ethnic subgroup definitions and outcome variable definitions supports the use and effectiveness of this approach
Funding Source: Office of Minority Health, DHHS

- Measuring Trends in Racial/Ethnic Health Care Disparities

Benjamin Cook, Ph.D., M.P.H., Thomas McGuire, Ph.D., Sam Zuvekas, Ph.D.

Presented By: Benjamin Cook, Ph.D., M.P.H., Researcher, Mathematica Policy Research, Inc., 955 Massachusetts Ave., Cambridge, MA 02139, Phone: (617) 301-8960,
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Research Objective: To describe three definitions of racial/ethnic health care disparities and compare estimated trends in disparities by these definitions. To provide guidance to national efforts tracking progress in disparities reduction.
Study Design: We estimate trends in two global measures of racial/ethnic disparities, total medical expenditure and having any outpatient or office-based visit in the last year. Three definitions of disparity are compared. The first definition, used by the Agency for Healthcare Research and Quality (AHRQ), is based on unadjusted means. The second definition, proposed by the Institute of Medicine (IOM), allows for mediation of racial/ethnic disparities through SES factors. The third definition relies on the independent effect of race/ethnicity after adjusting for all other factors. The IOM definition is implemented using a partial regression, and alternatively (and more precisely) through transformation of minority distributions of health status to look like whites' distributions. We apply the regressions to study the sources of change in disparities.
Population Studied: A nationally representative population of Blacks, Whites and Hispanics taken from the 1996-2004 Medical Expenditure Panel Survey (MEPS).
Principle Findings: Black-white disparities in having an office-based or outpatient visit and medical expenditure were unchanged or dissipated slightly between 1996-7 and 2002-3, depending on the measure and method used. By contrast, all methods find an increase in Hispanic-white disparities for both office-based or outpatient visits and medical expenditure. Estimates based on the independent effect of race/ethnicity are the most conservative accounting of disparities, underlining the importance of the role of SES mediation in study of trends in disparities. Increases in Hispanic-white disparities were not the result of shifts in SES among Hispanics over this period. Black-white disparity rates appear to be more influenced by higher black income and insurance status rather than improvements in the health care system.
Conclusions: Model-based estimates of trends in disparities are readily accomplished with MEPS data. No progress against disparities for blacks is evident for the outcomes studied; for Hispanics, disparities are worse.
Implications for Policy, Practice or Delivery: This paper provides a new method for measuring trends based in the IOM definition of racial disparity. The method adjusts for health status and allows for an analysis of the contribution of changes in SES over time.
Funding Source: Macarthur Foundation

- Assessing Disparities in Preventive Services among Asian American Medicare Beneficiaries

Ernest Moy, M.D., M.P.H., Amanda Borsky, Linda G. Greenberg, Ph.D.

Presented By: Ernest Moy, M.D., M.P.H., Medical Officer, Center for Quality Improvement and Patient Safety, Agency for Healthcare Quality and Research, 540 Gaither Road, Rockville, MD 20850, Phone: (301)427-1329, Fax: (301)427-1341, Email: ernest.moy@ahrq.hhs.gov

Research Objective: To examine disparities in preventive services experienced by Asian American Medicare beneficiaries at the national level and in the 9 metropolitan statistical areas (MSAs) with the largest Asian Medicare populations.

Study Design: This study builds upon two research contracts that sought to improve the race/ethnicity and SES categorization of Medicare beneficiaries. After assessing the current race/ethnicity data from the Medicare enrollment database (EDB), the first contract developed an algorithm using surname and geographic location to improve race/ethnicity coding for Asian Americans. The algorithm was validated using self-reported race/ethnicity from the 2000-2002 Medicare CAHPS survey. It was then applied to the entire 41.7 million Medicare beneficiaries. The second contract created and validated a measure for SES.
This study uses these improved race/ethnicity and SES codes to examine disparities experienced by Asian Medicare beneficiaries. Medicare administrative claims data (2002) were used to measure the receipt of cancer screenings and services to prevent complications of diabetes. Rates of receipt of these services by Asian and White beneficiaries were compared. Disparities within the 9 MSAs with the largest number of Asians 65 years of age or older were also examined.
Population Studied: The population studied is a probability sample of 1.96 million Medicare beneficiaries from the mid-2003 unloaded EDB. The population includes: Whites, African Americans, Hispanics, Asian/Pacific Islanders, and American Indian/Alaskan Natives enrolled in fee-for-service Medicare.
Principle Findings: The algorithm for identifying Asian American Medicare beneficiaries increased the number of individuals identified as Asian by 44% and improved the sensitivity of Asian race coding from 55% to 79% without loss of specificity. Using the improved coding, Asian-White differences in receipt of mammography, prostate specific antigen testing, colorectal cancer screening, and foot and eye examination among persons with diabetes were observed. Significant disparities often cut across age and socioeconomic status and were present in some MSAs but not others. Gender differences in Asian-White disparities were also found.
Conclusions: An algorithm using surname and geographic location to improve race/ethnicity coding greatly improved the utility of Medicare administrative data for examining Asian-White differences in care. Asian-White differences in receipt of preventive services were pervasive at the national level. Assessments of Asian-White differences in MSAs with large numbers of Asian Medicare beneficiaries showed variation across cities.

Implications for Policy, Practice or Delivery: Research on disparities experienced by Asian Americans typically focuses on the national or state levels. In contrast, this research provides us with a better understanding of disparities faced by Asians in specific MSAs. Such local analyses may help federal and state agencies target resources to specific areas more efficiently and allow communities to develop interventions that best meet the needs of their residents.
Funding Source: CMS

- **Sex Differences in the Use of ICDs for Prevention of Sudden Cardiac Death, 1999-2004**

Lesley Curtis, Ph.D.

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Research Objective: Many eligible Medicare beneficiaries do not receive implantable cardioverter-defibrillators (ICDs). Previous studies have documented sex differences in the use of ICD therapy, but the studies predate recent expansions in Medicare coverage and did not follow patients over multiple years.
Study Design: We used Medicare fee-for-service claims data and a retrospective cohort study design to examine sex differences in the rates of ICD use for primary and secondary prevention of sudden cardiac death from 1999 through 2004 in the United States. The primary prevention cohort included beneficiaries for whom a diagnosis of acute myocardial infarction (ICD-9-CM code 412 or 410.xx) and either heart failure (428) or cardiomyopathy (425.4) were reported on an inpatient, outpatient, and/or carrier claim. The date of the second qualifying diagnosis defined cohort entry and must have occurred between 1999 and 2004. Beneficiaries with a prior diagnosis of cardiac arrest (ICD-9-CM code 427.5) or ventricular tachycardia (427.1, 427.41 or 427.42) were excluded. The secondary prevention cohort consisted of beneficiaries for whom a diagnosis of cardiac arrest or ventricular tachycardia was reported on a single inpatient, outpatient, or carrier claim between 1999 and 2004. We identified receipt of an ICD by the presence of CPT code 33245, 33246, or 33249 on a single carrier claim.
Population Studied: Medicare fee-for-service beneficiaries aged 65 and older who met the

criteria for inclusion in the primary (n=117,817) or secondary (n=85,352) prevention cohorts.
Principle Findings: There were 56,835 men and 60,982 women in the primary prevention cohort. In the 2004 cohort, 25.0 per 1000 men and 5.6 per 1000 women received an ICD within a year of cohort entry. In multivariable analyses, men were 3 times more likely than women to receive an ICD (hazard ratio [HR] 3.4; 95 percent confidence interval [CI], 3.0-3.8). There were 44,705 men and 40,647 women in the secondary prevention cohort. Among men who entered the cohort in 2004, 107.4 per 1000 received an ICD, compared to 35.3 per 1000 women. Controlling for demographic variables and comorbid conditions, men were 2.5 times more likely than women to receive an ICD (95 percent CI, 2.3-2.6). Sex differences persisted when we stratified the multivariable analysis by age.
Conclusions: In the Medicare population, women are significantly less likely than men to receive an ICD for primary or secondary prevention of sudden cardiac death. The findings suggest that women are treated less aggressively than men and are less likely than men to receive guidelines-based care. It is essential that these findings be verified in data sets that include left ventricular ejection fraction and robust measures of comorbidity.
Implications for Policy, Practice or Delivery: Our findings highlight the urgent need for an improved understanding of sex differences in patterns of care.
Funding Source: NIA

- Do Hospitals Provide Lower Quality Care to Minorities Compared to Whites?

Darrell Gaskin, Ph.D., Christine Spencer, Sc.D., Patrick Richard, M.A., Gerard Anderson, Ph.D., Neil Powe, M.D., M.P.H., M.B.A., Thomas LaVeist, Ph.D.

Presented By: Darrell Gaskin, Ph.D., Associate Professor, African American Studies, University of Maryland, 2169 LeFrak Hall, College Park, MD 20742, Phone: (301) 405-1162, Fax: (301) 314-9932, Email: dgaskin@aasp.umd.edu

Research Objective: This study examines whether racial and ethnic disparities in quality of care exist within hospitals.
Study Design: Using three years of state inpatient discharge (SID) data, we computed for each hospital, race/ethnic specific quality measures using the AHRQ inpatient quality indicators (IQIs) and patient safety indicators (PSIs). We compared the observed and risk adjusted IQIs and PSIs for blacks, Hispanics and Asians to those of whites.
Population Studied: We used 2001-2003 state inpatient discharge (SID) data from 11 states: AZ, CO, FL, IA, MA, MD, MI, NC, NJ, NY, and WI, and 2000-2002 SID data from PA. These states were selected because they report patients' race and Hispanic origin, permit researchers to use the hospital identifiers, and collect all the data elements required to compute the AHRQ IQIs and PSIs. About 30% of the Asians and Hispanics and almost 40% of the whites and blacks reside in these 12 states. Almost 30% of the nation's hospitals are in these states.
Principle Findings: Risk adjusted IQIs and PSIs for blacks, Hispanics and Asians were not statistically worse than corresponding quality indicators for whites. In fewer than half of hospitals, observed IQIs and PSIs for the minority patients were higher than those for white patients.
Conclusions: Hospitals do not provide lower quality of care to their minority patients compared to their white patients.
Implications for Policy, Practice or Delivery: Disparities in access and use hospital services do not result in disparities in inpatient mortality and patient safety.
Funding Source: CWF

Disparities in Health & Health Care: The Role of Neighborhood Environments

Chair: Debra Perez, Ph.D., M.P.A., M.A.

Monday, June 4 • 4:30 p.m.-6:00 p.m.

- The Impact of Racial Isolation: Residential Segregation and Preterm Birth

Michelle Precourt Debbink, B.A.; M.D./Ph.D. Candidate, Michael D. Bader, B.A., Cameron Shultz, M.S.W., Lise Anderson, M.P.H.

Presented By: Michelle Precourt Debbink, B.A.; M.D./Ph.D. expected 2012, Medical Student, Public Health Policy Student, Health Management and Policy, University of Michigan Medical School and School of Public Health, 2358 Hilldale Dr., Ann Arbor, MI 48105, Phone: (734) 995-6820, Fax: (440) 274-9659, Email: mdebbink@gmail.com

Research Objective: We evaluate the correlation between racial residential segregation, as measured by spatial analysis of the racial composition in census tracts, and preterm

delivery in Michigan's metropolitan statistical areas.
Study Design: We create a hierarchical model to explore the correlation and relative impact of racial residential segregation, and specifically racial isolation, on preterm delivery. A distance-based measure of racial composition for each Census tract (representing the racial isolation of communities within a Census tract) and neighborhood variables from the 2000 Census (percent vacant housing, education level, median household income, percent unemployed, and number of children per household) comprise the tract-level variables, and maternal age and race (as reported in Michigan vital statistics data from 2000) comprise the individual-level variables. The hierarchical modeling analysis will be carried out using STATA 9 (College Station, TX).
Population Studied: Women in Michigan Metropolitan Statistical Areas (MSAs) with births recorded by the State of Michigan's Department of Community Health Vital Records in the year 2000.
Principle Findings: We expect to find that residential racial segregation (as measured by the spatial racial isolation of Census tracts) predicts preterm delivery. We expect this association to be negative (as segregation increases, gestational age decreases) for African Americans. However, we hypothesize that segregation will offer a protective effect for Caucasians. Previous studies looking at alternate parameters of segregation (e.g., dissimilarity index) have shown a predictive relationship that holds when external factors (income and education) are controlled.
Conclusions: By using a distance-based measure of racial composition, we focus on the racial isolation of communities as a parameter of residential segregation. Our analysis furthers existing research regarding segregation and health by exploring the impact of this largely-unexplored parameter of segregation. We expect our findings to show that an important aspect of segregation leading to adverse outcomes for the African American community is the racial isolation experienced by segregated communities, and not merely the concentration of poverty.
Implications for Policy, Practice or Delivery: Racial disparities in preterm delivery persist despite clinical efforts to improve prenatal care, so evaluating nonclinical factors in preterm delivery may lead to improved policy and population-based solutions. The mechanisms by which social and neighborhood factors contribute to preterm delivery require further research, but continued evaluation of these influences may lead to a better understanding of the ways policy can be used to alter the isolating circumstances of residential segregation.

- **The Contribution of Patient Clustering to Racial, Ethnic, and Linguistic Disparities in Primary Care Quality**

Hector Rodriguez, Ph.D., M.P.H., Ted von Glahn, M.S., William H. Rogers, Ph.D., Dana Gelb Safran, Sc.D.

Presented By: Hector Rodriguez, Ph.D., M.P.H., Assistant Professor, Institute for Clinical Research and Health Policy Studies, Tufts-New England Medical Center, 750 Washington Street, Box 345, Boston, MA 02111, Phone: (617) 636-5751, Fax: (617) 636-8351,
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Research Objective: Certain racial and ethnic minority groups consistently report worse primary care experiences than Whites. It is unclear how much reported differences are due to minority patients experiencing inferior care relative to Whites in the same practices vs. disproportionately receiving care in practices with poor access and/or lacking patient-centered care. This study assesses whether the clustering of patients within practices of primary care physicians (PCPs) explains racial, ethnic, and linguistic disparities in assessments of care.
Study Design: This study used the Ambulatory Care Experiences Survey (ACES), a well-validated instrument that measures patients' experiences with a specific, named PCP and that PCP's practice. Surveys were administered to active patients from the practices of 1588 PCPs from 27 medical groups in California, targeting 40 completed surveys per PCP. To examine the contribution of patient clustering to racial, ethnic, and linguistic disparities in patients' assessments of primary care, Generalized Linear Latent and Mixed Models (GLLAMM) that used random effects to account for patient clustering within PCP practices were used. These models accounted for respondent age, gender, education, self-rated physical and mental health, chronic disease count, overall primary care visits, and PCP-patient relationship duration for estimating differences in ACES summary scores.
Population Studied: The analytic sample included 49,861 patients who visited their PCP during the 8 months prior to receiving the survey.

Principle Findings: More than half (50.9%) of Asians who primarily speak a language other than English and 36.5% of Latinos who primarily speak Spanish were patients of PCPs with high concentrations (40% or more) of patients from their own race/ethnicity. By contrast, the majority (79.8%) of Blacks were patients of PCPs with a minority of Blacks (10% or fewer). Irrespective of their primary language, Asians and Latinos reported lower PCP-patient relationship quality, organizational access, and care coordination compared to Whites ($p<0.001$). Blacks reported equivalent or better primary care experiences compared to Whites. Disparities in Asian patients' experiences persisted after accounting for patient clustering. However, accounting for patient clustering within practices significantly reduced disparities in Latino patients' assessments of care. Practices with a high concentration of Latino patients were associated with worse primary care experiences compared to practices with low or moderate Latino patient concentrations. As a result, accounting for practice-level Latino patient concentration in regression models eliminated Latino-White differences.
Conclusions: The less favorable care experiences reported by Asians appear to occur systematically suggesting that differential treatment and/or systematic differences in Asian patients' reporting patterns account for Asian-White differences. By contrast, the less favorable experiences reported by Latino patients appear to reflect substantive differences in their care experiences, due in large part to PCPs' practices.
Implications for Policy, Practice or Delivery: Taken together with previous evidence of differences in the care-rating tendencies of Asian patients, these results indicate that adjusting for Asian race/ethnicity in survey-based quality measurement is appropriate. However, quality initiatives should not control for Latino ethnicity because doing so will mask differences in performance that are attributable to the practices themselves. In order to significantly reduce Latino-White differences in patients' assessments of primary care, initiatives should focus on practices with high concentrations of Latinos.

▪ Race/Ethnicity, Neighborhood Socio-Economic Status and Allostatic Load

Chloe Bird, Ph.D., Brian Finc, Ph.D., Jose Escarce, M.D., Ph.D., Ricardo Basurto, M.S., Teresa Seeman, Ph.D., Nicole Lurie, M.D.

Presented By: Chloe Bird, Ph.D., Senior Sociologist, Health Unit, RAND, 1776 Main Street, PO Box 2138, Santa Monica, CA 90407, Phone: (310) 393-0411 x6260, Fax: (310) 260-8259, Email: chloe@rand.org

Research Objective: A growing body of research demonstrates relationships between residential neighborhood context and health. However, few studies examine potential biological pathways through which neighborhoods affect health. We examined the extent to which neighborhood characteristics are related to biological markers of stress, based on a summary index of allostatic load, adjusting for individual characteristics.
Study Design: Using 3-level hierarchical linear regression, we analyzed National Health and Nutritional Examination Survey III (NHANES) interview and laboratory data, merged with data on sociodemographic characteristics of their residential census tract. Allostatic load was measured as a summary score (range 0-9) based on clinical cut points for 9 indicators from 3 systems: metabolic (total cholesterol, HDL cholesterol, glycosylated hemoglobin, waist/hip ratio), cardiac (systolic and diastolic blood pressure, radial heart rate) and inflammatory (c-reactive protein, serum albumin).
Population Studied: Our analyses included 14,413 adults from 83 counties and 1805 census tracts, who completed surveys and medical exams, were not missing on key components of the outcome measures, and for whom residential census tract could be geocoded. The sample was 47% male; 43% white 27% black, 26% Hispanic, 4% other. Subjects ranged in age from 19.5 to 90 (mean = 48); 53% were employed and 58% had at least a high school education. The mean family income/poverty ratio was 2.41.
Principle Findings: Across all models, individual level socio-economic controls including Hispanic ethnicity ($p < .001$), lower family income ($p < .03$), lower education ($p < .05$), lack of employment ($p < .005$), age ($p < .001$) and being male ($p < .001$) were independently associated with higher allostatic load. Even after adjusting for these individual characteristics, a higher proportion of adults in the census tract with less than high school education was associated with a higher allostatic load (coefficient = 0.46, $p < .0001$). In a separate analysis, higher median household income (in 10k units) was associated with lower allostatic load independent of individual characteristics (coefficient = -0.03, $p = .01$). Additional stratified analyses of

neighborhood SES explore effects by race/ethnicity.
Conclusions: Allostatic load is a biomarker of early health decline. The association of lower socioeconomic status with higher allostatic load, controlling for individual characteristics, suggests a potentially crucial pathway through which low-SES neighborhoods may affect both individual and population health.
Implications for Policy, Practice or Delivery: By assessing potential pathways through which health—and health disparities may be generated, this study is part of a larger effort aimed at developing an understanding of whether changing neighborhood features, such as neighborhood quality could improve health and reduce health disparities. The mechanisms through which these effects are produced need to be explored.
Funding Source: NIEHS

- **The Effects of Neighborhood and Patient Characteristics on Time Spent in Emergency Medical Services Cardiac Care**

Thomas Concannon, Ph.D., M.A., John L. Griffith, Ph.D., David M. Kent, M.D., M.S., Sharon-Lise Normand, Ph.D., Joseph P. Newhouse, Ph.D., Harry P. Selker, M.D., M.S.P.H.

Presented By: Thomas Concannon, Ph.D., M.A., Assistant Professor, Institute for Clinical Research and Health Policy Studies, Tufts-new England Medical Center, 750 Washington Street #63, Boston, MA 02115, Phone: (617) 636-8441, Fax: (617) 636-0022,
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Research Objective: To explore the patient and neighborhood-level factors associated with time spent in emergency medical services (EMS) care among patients with suspected acute cardiac syndromes (ACS). A secondary objective was to explore the impact of individual patient characteristics and neighborhood composition on exceptionally long delays to hospital arrival.
Study Design: Observational study with controls for patient acuity and neighborhood characteristics. Propensity scores were used to improve balance by race/ethnicity.
Population Studied: Residents in ten Dallas County, Texas municipalities who made a call to EMS services with cardiac-related symptoms from January 1, 2004 through December 31, 2004. The data were compiled from EMS "run" sheets and include patient clinical and demographic variables; date, time and location of emergency calls; EMS location and response times; and hospital location and treatment capability. 5,597 calls were made, of which 490 were delayed 15 minutes or more beyond average.
Principle Findings: Women were nearly twice as likely as men to be delayed at least 15 minutes beyond the average time in EMS care, compared to men. Men had half to two-thirds the odds [0.57 (0.48, 0.68)] of being delayed this length of time, compared to women. Among delayed women, 171 (56.6%) were delayed for reasons other than bypass of a hospital without cardiac catheterization facilities. Significant delays were caused almost exclusively by time spent on-scene and time in the EMS vehicle from scene to hospital, with the latter contributing most of the additive effect.
Conclusions: We found that patient-level characteristics were the largest and most significant predictors of time spent in EMS care. Our study is the first to target the analysis beyond the average time in EMS care to the determinants of clinically meaningful delays in EMS care. In the second stage of our analysis, our results were statistically significant and potentially severe for a large number of women who were significantly delayed.
Implications for Policy, Practice or Delivery: We identify several new areas for future policy development, including: eliminating the association of gender and time in EMS care, defining clinically appropriate and inappropriate delay, introducing technology into the EMS setting to promote hospital pre-notification for acute cardiac disease and to improve of EMS handoff to the emergency department.
Funding Source: AHRQ

- **Disparities in Alcohol Environments and their Effects on Adolescent Drinking Across Sociodemographic Groups in California**

Khoa Truong, Ph.D. Candidate, M.Phil., M.A., Roland Sturm, Ph.D.

Presented By: Khoa Truong, Ph.D. Candidate, M.Phil., M.A., Doctoral Fellow, RAND Graduate School, RAND Corporation, 1776 Main Street, Santa Monica, CA 90407, Phone: (310) 393-0411, Fax: (310) 260-8159, Email: truong@rand.org

Research Objective: Our study investigates the disparities in alcohol environments and the relationship between various types of alcohol outlets and adolescent drinking across sociodemographic groups.

Study Design: We merge geo-coded individual level data from the Adolescent section of the California Health Interview Survey to alcohol license data from the California Department of Alcoholic Beverage Control. With exact location of alcohol outlets and respondent home addresses, we use ArcMaps to generate varying radii centered at adolescent residence, and measure all alcohol retails sources in each geographical unit. We examine how the commercial availability of alcohol differs systematically across sociodemographic groups, and analyze how the total number of outlets, off-sale retails, and on-sale establishments located within various distances from homes affect adolescents' self-reported alcohol use in the past month and ever driving after drinking. Among on-sale licenses, we distinguish eating places from bars, taverns, and night clubs. Multivariate logistic regression models are used to discern the effect of alcohol environments from adolescents' individual factors, family characteristics, and neighborhood socio-demographic composition.
Population Studied: Analytic data are representative to all adolescents aged 12-17 living in California in 2003.
Principle Findings: Alcohol availability - measured by mean and median number of various types of alcohol outlets, is consistently higher in minority, lower income, and lower education groups. Adolescent heavy drinking episodes are found to be statistically and significantly associated with total number of licenses, on-sale establishments, off-sale retails, and restaurants, respectively, after controlling for individual, family, and neighborhood factors. Driving after drinking is statistically and significantly associated with each measure of alcohol availability except for off-sales. Odd ratios vary from 1.07 (95% C.I.: 1.02, 1.13) - the marginal effect of total number of licenses on binge drinking to 2.37 (95% C.I.: 1.70, 3.30) - the marginal effect of bars on driving after drinking. These relationships hold for alcohol outlets located within 1 mile radius from adolescent homes and diminish for those located further out. Prevalence of binge drinking in the past month among those who ever had a few sips of alcoholic drinks (37% of the total adolescent population) is about 40%. Simulation results show that if on-sale licenses increase to its 90 percentile of the current distribution, binge drinking among adolescents would increase to 44.4%.
Conclusions: Our findings provide evidence of the dynamic relationship between adolescent drinking, its associated risky behavior and the alcohol environments. As alcohol outlets are more present in minority, lower income, and lower education groups, disparities in health risks are worsened by outlets' direct effects on problem drinking and indirect alcohol-related problems such as violent crime and drunk driving.
Implications for Policy, Practice or Delivery: Alcohol control policy needs to find effective ways to cut ample opportunities for youths to get alcohol from commercial sources around their home. Special attention should be paid to disadvantaged neighborhoods with higher outlet concentration. Whether it is through tightening licensure or enforcing laws related to illegal sales of alcohol to minors, that would help both reduce underage drinking and curb disparities in health risks due to alcohol environments.
Funding Source: RWJF

Impact of Health Financing, Organization & New Technologies on Health Care Disparities

Chair: Jessica Greene, Ph.D.

Tuesday, June 5 • 1:30 p.m.-3:00 p.m.

▪ Racial Disparities in Antidepressant Use in Nursing Homes: The Role of Education

Michele J. Siegel, Ph.D., Judith A. Lucas, Ed.D., Ece Kalay, B.A., Stephen Crystal, Ph.D.

Presented By: Michele J. Siegel, Ph.D., Assistant Research Professor, Institute for Health, Rutgers, The State University of New Jersey, 30 College Avenue, New Brunswick, NJ 08901, Phone: (732) 932-6943, Fax: (732) 932-8592,
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Research Objective: With the development and diffusion of new generation antidepressants, there has been an increase in the diagnosis of depression and prescription of antidepressant medication. Antidepressant use increased among all subgroups examined, including nursing home - NH - residents. However, within nursing homes, rates of antidepressant use among those diagnosed with depression remain higher among whites than blacks, and higher among those with more education. The aim of this study is to examine whether low education exacerbates racial disparities in treatment rates.
Study Design: This was a cross-sectional, secondary data analysis of the effect of black race, low education, and their interaction on antidepressant use among NH residents

diagnosed with depression. The 1999-2000 Minimum Data Set - MDS - for all NH residents in Ohio was the source of individual-level data. Correlations among covariates of interest were examined, followed by linear probability models with robust standard errors and logistic regression models. Logistic models were estimated twice. First, black race was interacted with three dummies for depression diagnosis, female gender, and lack of a high school degree. Then the model, with the three dummies, was estimated separately by race.
Population Studied: Nursing home residents in Ohio in 1999-2000, using MDS data that included 97,551 whites and 12,667 blacks. After deleting observations missing values for included covariates, sample sizes were 87,998 and 11,489.
Principle Findings: Among NH residents with a depression diagnosis, bivariate results indicate that a higher proportion of whites than blacks use antidepressants. This racial difference in treatment rates is fairly constant within subgroups defined by age, gender and comorbid health conditions. However, the difference is smaller among those with, than among those without, a high school degree. Regression results indicate that a depression diagnosis increases the probability of antidepressant use; female gender and lack of a high school degree reduces it. The interaction of black race with female gender had no additional effect on antidepressant use; the interaction of black race with lack of a high school degree augmented the effect of race or lacking a degree alone. In logistic models, estimated separately by race, 95 percent confidence intervals - CI - overlapped for the depression and gender dummies, but not for the education dummy. The odds of antidepressant use among whites without, compared to those with, a high school degree was .938, CI .903-.973. For blacks, the odds ratio was .808, CI .726 - .899.
Conclusions: Our results indicate that black race and low education are associated with reduced antidepressant use among depressed NH residents. More notably, the combination of the two augments the effect of either attribute alone. Differentials in treatment rates of whites and blacks lacking a high school degree are larger than of those with a degree.
Implications for Policy, Practice or Delivery: Nursing homes, and the government agencies that regulate them, should be mindful of these disparities by race and schooling when assessing treatment strategies for NH residents with depression. They should be particularly cognizant of potentially lower treatment rates among blacks lacking a high school degree.
Funding Source: NIMH, AHRQ

- **Racial Disparities in Use and Quality of Nursing Homes**

David Smith, Ph.D., Zhanlian Feng, Ph.D., Mary Fennell, Ph.D., Jacqueline Zinn, Ph.D., Vincent Mor, Ph.D.

Presented By: David Smith, Ph.D., Professor, Department of Risk, Insurance and Healthcare Management, Temple University, 411 Ritter Annex (004-00), 1301 Cecil B. Moore Ave., Philadelphia, PA 19122, Phone: (215) 204-8082, Fax: (215) 204-4712,
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Research Objective: Assess the effect of racial patterns of nursing home use on disparities in care.
Study Design: The National Nursing Home Survey has noted a recent decline in white use and an increase in black use of nursing homes, with black use rates now exceeding white rates. Nursing home black use lagged white use for almost three decades after the implementation of Medicare, Medicaid and Title VI enforcement and well after rough parity in hospital use and physician visits had been achieved. We used three sources of information to explore the implication of these changes in more detail: the Online Survey Certification and Reporting System (OSCAR), the Minimum Data Set (MDS) and the United States Census. The recently available racial identifiers in the MDS make nursing homes the only sector of the healthcare system where racial information is available on the full population of providers and users of services. All of the data used in this analysis are for 2000. We constructed measures of black and white elderly use rates, residential and nursing home segregation and nursing home quality indicators, comparing the results for the nation as a whole, states and 147 Metropolitan Statistical Areas with sufficient black elderly and nursing homes to construct reliable estimates.
Population Studied: 14,374 free standing nursing homes and the 1,466,471 residents they serve, which accounts for about 88% of all nursing home facilities and 89% of all nursing home residents in the nation. Hospital based units, which tend to focus on short stay transitional care were excluded.
Principle Findings: Nursing home care is still highly segregated (Index of Dissimilarity .65) Across all areas blacks are substantially more

likely to be located in homes that have serious deficiencies, poorer staffing ratios and greater financial vulnerability. Black elderly nursing home use rates are 17% higher than white use rates nationally. There was no significant difference in the case mix severity of black and white nursing home residents. MSAs with the highest relative black use of nursing homes are concentrated in the South. Nursing home segregation in MSAs was highly correlated with a composite measure of racial disparities in quality (.62).
Conclusions: Nursing home care remains quite separate and unequal; reflecting patterns of residential segregation and, possibly, admission practices. The relatively higher black use of nursing homes may reflect differences in morbidity as well as white access to assisted living facilities and other home and community based alternatives. While crude parity in access has been achieved, blacks tend to be concentrated in poorer quality facilities.
Implications for Policy, Practice or Delivery: In order to reduce racial disparities in the quality of long term care, nursing home admission practices should be more closely monitored and minority access to more desirable alternatives to nursing homes should be expanded.
Funding Source: CWF

- **Improved Diabetes Care for Individuals Residing in Health Disparity Zones Delivered by Disease Management**

Carter Coberley, Ph.D., Gary Puckrein, M.D., Ph.D., Angela Dobbs, M.A., Matthew McGinnis, B.S., Sadie Coberley, Ph.D., Dexter Shurney, M.P.H., M.B.A., M.D.

Presented By: Carter Coberley, Ph.D., Vice President, Center for Health Research, Healthways, Inc., 3841 Green Hills Village Drive, Nashville, TN 37215, Phone: (615) 517-1722, Fax: (615) 658-5806,
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Research Objective: The quality of care received by individuals living in areas of health disparity is of concern; however, the extent at which health disparities impacts commercially insured populations remains largely uncharacterized. The purpose of this study was to examine a diabetes population for members living in areas of health disparity and to evaluate the quality of diabetes care received. In addition, these same members were evaluated during their first year of participation in diabetes disease management (DM) programs to determine the impact of these programs on diabetes care.
Study Design: A proprietary zip code mapping methodology was used to identify regions of the U.S. with high diabetes prevalence rates (health disparity zone - HDZ) and to identify areas with high densities of minority populations (minority zip codes). Members with diabetes residing in HDZs were compared to members living outside theses areas, and members residing in HDZs were further evaluated for those living in minority zip codes or non-minority zip codes. An A1C testing rate was selected as a proxy for quality of care received by members residing in these defined geographic locations, and the percent improvement in A1C testing achieved during participation in the DM programs was compared to baseline (prior to start of programs). The relationship between receiving telephonic interventions as part of these DM programs and the observed improvement in A1C testing were also assessed.
Population Studied: The large, geographically diverse population was comprised of 37,425 members with diabetes and 12 months of health plan eligibility (baseline) plus 12 months of participation in diabetes DM programs.
Principle Findings: Prior to the start of DM programs, members living HDZs had lower A1C testing rates compared to members living in non-HDZs. However, members in both areas achieved significant improvement in testing rates during participation in the DM program ($p<0.05$). Further evaluation of members living in HDZs revealed that members living in minority zip codes had a large gap (28.8%) in their baseline A1C testing rates compared to members living in non-minority zip codes. During participation in the DM programs, members living in minority zip codes achieved a 15.5% improvement ($p<0.0001$), helping to narrow this disparity. Members living in non-minority zip codes within HDZs also obtained improvement, albeit not statistically significant. A relationship between telephonic intervention and improved testing rates was observed. Called members living in HDZs or minority zip codes achieved greater improvement (38.3% and 56.1%, respectively) than called members living in non-HDZs or non-minority zip codes (9.7% and 2.6%, respectively).
Conclusions: Participation in these diabetes DM programs was associated with improved diabetes care. Members living in areas of health disparity experienced even greater benefit from these programs as a narrowing of gaps in diabetes care was observed.

Implications for Policy, Practice or Delivery: DM programs are an effective and practical means to deliver improved quality of care to large and diverse diabetes populations. In addition, members experiencing health disparities are experiencing even greater benefit from these programs.

- **The Adoption of Drug Eluting Coronary Stents by U.S. Hospitals, 2003-2004**

Peter Groeneveld, M.D., M.S., Feifei Yang, M.S., Mary Anne Matta, M.S.

Presented By: Peter Groeneveld, M.D., M.S., Assistant Professor, Center for Health Equity Research and Promotion, Philadelphia VA Medical Center and the University of Pennsylvania, 1229 Blockley Hall, 423 Guardian Drive, Philadelphia, PA 19104-6021, Phone: (215) 898-2569, Fax: (215) 573-8778, Email: peter.groeneveld@va.gov

Research Objective: Drug eluting coronary stents--DES, FDA-approved in April of 2003, reduce the risk of recurrent blockages in coronary arteries. Although Medicare has covered DES since the date of FDA approval, it is uncertain if there were differences in the rates that hospitals initially utilized these newer stents compared to the older bare metal stents--BMS. Academic hospitals are often the earliest adopters of new technology, and they are also more likely to have large minority patient populations, thus we hypothesized that health-system-wide racial differences in access to DES may have been ameliorated by greater early DES use at academic hospitals.
Study Design: We examined Medicare claims from April, 2003 through December, 2004 and identified patients who had received either BMS or DES. We calculated the quarterly rates of DES use at each hospital among all percutaneous coronary interventions. Ordinary least squares multivariate regression models were fitted to these hospital-level data, with the percentage of DES uptake as the dependent variable. The calendar quarter, each hospital's racial composition, its academic status, as well as squared and interaction terms were independent variables. Generalized estimating equations were used to adjust for repeated sampling over multiple time periods. We concurrently fitted a multivariable logistic regression model to the patient-level data to compare racial differences in the likelihood of receiving the newer DES compared to BMS during each quarter following FDA approval of DES.
Population Studied: 33,575 Medicare beneficiaries undergoing percutaneous coronary intervention in 1,296 U.S. hospitals nationwide between April, 2003 and December, 2004.
Principle Findings: Academic hospitals had more rapid uptake of drug eluting stents in the first 5 quarters after FDA approval, but by the end of 2004 the utilization rates of DES were virtually identical in both academic and non-academic centers. During this time, black Medicare beneficiaries were more likely than white beneficiaries to undergo percutaneous coronary interventions in academic centers--37 versus 24 percent, p less than 0.001. The patient-level regression indicated that whites at academic centers were the most likely to receive DES rather than BMS. Compared to whites at academic centers, blacks at academic centers received DES at lower rates--odds ratio 0.71, p equals 0.07. Whites at non-academic centers also received DES at lower rates--odds ratio 0.69, p less than 0.001. The lowest rates of DES use were among blacks at non-academic centers--odds ratio 0.49, p less than 0.001.
Conclusions: Although academic centers had larger numbers of black patients and were more likely to be early users of DES, whites were still more likely than blacks to receive DES when undergoing percutaneous coronary intervention at both academic and non-academic centers. The overall higher rate of DES use at academic centers had only a marginal effect on reducing racial differences in care.
Implications for Policy, Practice or Delivery: Blacks are at a disadvantage in access to new technology early in its use. Greater access to academic medical centers by the U.S. black population does not substantially ameliorate racial differences in access to innovation.
Funding Source: Institute for Health Technology Studies

- **Effects of Disparities in Funding of Tribally-operated Health Programs on Health Outcomes of AI/AN**

Carol Korenbrot, Ph.D., Chi Kao, Ph.D., James A. Crouch, M.P.H.

Presented By: Carol Korenbrot, Ph.D., Research Director, Office of the Executive Director, California Rural Indian Health Board, 4400 Auburn Boulevard, 2nd Floor, Sacramento, CA 95841, Phone: (916) 929-9761, Fax: (916) 929-7246, Email: carol.korenbrot@crihb.net

Research Objective: To determine whether Indian Health Service (IHS) funding of Tribally-

Operated Health Programs (TOHP) has an effect on preventable hospitalizations of American Indian/Alaska Natives (AIAN) who use them, after controlling for characteristics of the TOHP and their service areas. TOHP are one of three types of Service Units funded by the IHS: IHS direct service programs, TOHP and Urban Indian programs. Owned by sovereign tribes, TOHP provide comprehensive primary care, but usually must contract for specialty care for their users with other ambulatory care providers. They often have insufficient funds to contract for hospital inpatient or outpatient care. The result is that many AIAN users of TOHP who are covered by the IHS, cannot get the specialty care they need. The state of California has 107 federally recognized tribes and more AIAN than any other single state. The tribes form consortia to form TOHP that have their own comprehensive primary care clinics, and contract with private health service providers for specialty and hospital care.

Study Design: We conducted secondary data analysis of 3,181 preventable hospitalizations of AIAN users of 20 TOHP in California. We used Poisson regression models controlled for age and gender of the AIAN hospitalized and Generalized Estimating Equations to account for clustering within TOHP. The dependence of the preventable hospitalizations on the IHS Federal Disparity Index (FDI) was studied. The FDI is defined as the adjusted health care costs per user funded by the IHS expressed as a percent of benchmark costs for comparable benefits of specified federal employees. Both numerator and denominator of the FDI are determined by the IHS using formulas and data developed by actuaries and Indian health experts. In our study we investigate three kinds of models to determine: 1) the FDI effect on the outcome; 2) which components of the FDI determine the effect; 3) whether patient volume, service type or quality of care (GPRA) indicators for the TOHP mediate the FDI effect; 4) what characteristics of the rural communities in the service areas of the TOHP confound the effect including: demand for TOHP services, Indian Gaming revenues and disparities with Whites in education, income, employment, transportation, telephone service and crowding.

Population Studied: Records in the IHS National Patient Information Registry System of an annual average 42,153 AIAN Active Users of TOHP from 1998 to 2002 in California were linked with state hospital discharge records. Active Users are defined by the IHS as enrolled members of federally recognized tribes living on or near tribal lands who used an IHS-funded service at least once either in the year reported, or the two years prior to the reporting year. Data on TOHP and community characteristics came from other IHS data sources, state Indian Gaming reports, and AIAN surveyed in Census 2000.

Principle Findings: Disparities in IHS funding of TOHP had a robust effect on preventable hospitalizations of AIAN who use them, even after controlling for potentially confounding characteristics of their service areas. For TOHP with less than 60% of benchmark health care costs funded, the preventable hospitalization rate dropped 12% for every increase of 10% of costs funded ($P=0.011$). After controlling for characteristics of the TOHP and service area communities with significant effects on preventable hospitalizations, the range of the IHS funding effect remained significant ($0.01< P <0.03$) and varied only from 9% to 13%. The component of the IHS Funding Disparity Index that explained the effect was the amount of IHS funds provided per AIAN user of the TOHP. None of the TOHP service indicators investigated for patient volume, service type or quality of care was found to mediate the IHS funding effect.

Conclusions: Underfunding health care that TOHP provide to AIAN is associated with adverse health effects on AIAN that are preventable with additional IHS funding of care. More research is needed to determine what service characteristics of TOHP services are improved by the funding to produce these results.

Implications for Policy, Practice or Delivery: The evidence supports a change of IHS policy funding TOHP so that at least 60% of the health care costs of the AIAN who use the program are covered, instead of the current policy of 40%. The evidence indicates that the formalized performance and accountability process of the President's Management Agenda that has been critical of TOHP could benefit from including more information on funding and health outcomes before implementing 'pay for performance' policies for TOHP.

Funding Source: AHRQ

Gender & Health

Gender Differences in Care for Chronic Disease

Chair: Michelle Seelig, M.D., M.S.H.S.

Sunday, June 3 • 11:00 a.m.-12:30 p.m.

▪ Gender Differences in Colorectal Cancer Screening, Attitudes & Information Preferences

Joan Griffin, Ph.D., Melissa Partin, Ph.D., Greta Friedemann-Sanchez, Ph.D., Diana Burgess, Ph.D.

Presented By: Joan Griffin, Ph.D., Research Investigator/Assistant Professor, Center for Chronic Disease Outcomes Research, Minneapolis VA Medical Center, One Veterans Drive, Mailstop 111-0, Minneapolis, MN 55417, Phone: (612) 467-4232, Fax: (612) 725-2118, Email: joan.griffin2@med.va.gov

Research Objective: Four screening modalities have been found to be efficacious at reducing colorectal (CRC) mortality: Fecal Occult Blood Test, flexible sigmoidoscopy, Double Contrast Barium Enema, and colonoscopy. National data suggest that women are less likely to be screened for CRC than men. Recent qualitative studies suggest that men and women may have different CRC screening attitudes and information preferences. The objective of this quantitative study was to use the hypotheses generated from the qualitative work and test if gender differences exist in adherence to CRC screening guidelines and barriers and facilitators associated with flexible sigmoidoscopy and colonoscopy.

Study Design: Cross sectional mixed-mode survey of veterans. Self-administered questionnaires were mailed to all participants in 2006. After the initial mailing a follow up post-card was sent to all participants. Those that did not respond were sent a second survey. Non-responders to the second survey were telephoned and asked to complete the survey over the phone.

Population Studied: Female and male veterans between the ages of 50 and 75, who received care at the Minneapolis VA Medical Center's primary care clinic in the two years before the study was initiated. Women were over sampled in order to compare CRC screening adherence and to examine how attitudes and information preferences about CRC screening varied by gender. Approximately 35% of the 686 participants who completed the survey by mail or phone were women (n=242); 65% (n=445) were men. Individuals with colorectal cancer diagnoses, those enrolled in VA adult day care and nursing home facilities, or with dementia or Alzheimer's disease documented in VA administrative databases were excluded.

Principle Findings: Men and women did not significantly differ in their adherence to CRC screening guidelines and nearly equal proportions of men and women preferred colonoscopy for screening over all other modes. In spite of these findings, men and women did report significant differences in the barriers and attitudes toward screening by flexible sigmoidoscopy or colonoscopy. Women, for example, were significantly more likely to report a stronger sense of physical vulnerability about having the procedure, feeling exposed, and embarrassment throughout the process. Men generally reported higher perceived risk of developing or detecting CRC than women. Contrary to earlier qualitative findings, men and women did not differ in their preferences for making decisions about screening with their provider or in the type or timing of information about screening procedures.

Conclusions: Gender differences in screening behavior among veterans may be narrowing, but significant differences exist in the barriers and attitudes men and women face when choosing to be screened, especially for endoscopic procedures.

Implications for Policy, Practice or Delivery: Future promotion for maintaining adherence to screening guidelines may benefit from materials tailored differently for men and women.

Funding Source: VA

▪ Quality Measurement & Gender Differences in Managed Care Populations with Chronic Diseases

Ann Chou, Ph.D., M.P.H., Carol Weisman, Ph.D., Arlene Bierman, M.D., Sarah Hudson Scholle, Dr.P.H.

Presented By: Ann Chou, Ph.D., M.P.H., Assistant Professor, Health Administration & Policy, University of Oklahoma, 801 NE 13th Street, CHB 355, Oklahoma City, OK 73104, Phone: (405) 271-2115 x37082, Fax: (405) 271-1868, Email: ann-chou@ouhsc.edu

Research Objective: To examine possible gender disparities in meeting low-density lipoprotein cholesterol (LDL) screening and control quality measures among commercial health plans and in commercial and Medicare managed care populations of patients with a history of cardiovascular disease (CVD) or diabetes mellitus (DM)
Study Design: All HEDIS-reporting commercial plans were invited to submit data on CVD and DM-related quality measures and data were obtained from Medicare managed care plans through CMS. Four HEDIS quality measures serve as dependent variables: LDL screening and control at <100 mg/dL among patients with DM and CVD. Analyses were conducted at both patient- and health plan-level. For patient level, hierarchical generalized linear model was employed to estimate HEDIS measures as a function of gender, controlling for other patient characteristics on the first level, and the clustering effect of plans on the second level. For the plan level, descriptive statistics were compiled on gender differences, using T and chi-squared tests to determine significance of these differences.
Population Studied: Three samples were included for analyses: (1) 11,813 patients from 31 commercial health plans; (2) 96,055 patients from 148 Medicare managed care plans; (3) 46 plans submitting plan-aggregated data.
Principle Findings: At the patient level, women with CVD were less likely to be screened in both commercial (OR=0.88; 95% CI: 0.79-0.99) and Medicare populations (OR=0.91; CI: 0.86-0.98). For LDL screening in patients with DM, no gender differences were observed in both commercial and Medicare populations. For LDL control, commercially insured women with CVD were less likely to achieve adequate control than men (OR=0.72; CI: 0.64-0.82). Women with DM enrolled in Medicare and those in commercial plans were 0.75 and 0.81 times, respectively, as likely to achieve control as their male counterparts. At the plan level, average male-female differences in meeting LDL screening indicator among CVD patients was 2.6% (p=0.008) in commercial and 1.6% (p=0.003) in Medicare plans. The difference in screening was not significant for patient with DM in commercial plans and was <1% favoring women in Medicare plans. For LDL control, gender differences were significant among CVD patients in commercial (9.3%, p<0.0001) and Medicare plans (8.5%, p<0.0001). Similar patterns for patients with DM in commercial (5.6%, p<0.0001) and Medicare (6.4%, p<0.0001) plans were observed.
Conclusions: Gender disparities are well documented in guideline-indicated CVD management. Few studies have evaluated the quality of CVD care in the ambulatory setting, especially in managed care populations with chronic conditions. This study contributes to literature by identifying significant and consistent patient and plan level gender disparities in LDL control in a sample of diverse patients and managed care plans. Gender disparities reported in other settings are present in managed care despite equity in access and possibly quality of care.
Implications for Policy, Practice or Delivery: Gender disparities in CVD prevention and treatment in acute care settings can contribute to greater adverse clinical outcomes in women, who may need more aggressive management than men due to differences in risk factors and symptom presentation. Gender-tailored strategies are needed to encourage women to increase their knowledge about disease risks, seek adequate care and comply with therapeutic interventions.
Funding Source: AHRQ, American Heart Association

- **Primary Care Mediates Gender Differences in Hospital Utilization at the End of Life**

Andrea Kronman, M.D., M.Sc., Karen M Freund, M.D., M.P.H., Arlene S. Ash, Ph.D., Ezekiel J. Emanuel, M.D., Ph.D.

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Research Objective: To see if differential receipt of primary care mediates gender differences in end of life hospital utilization.
Study Design: Retrospective analysis of Medicare data. Outcomes were measured during the final 6 months of life: hospital days, hospital admissions, and 2 Prevention Quality Indicators (admissions for congestive heart failure and congestive heart failure). Our key predictors of number of primary care physician visits and gender were identified during the 12 preceding months. We stratified the population by gender, and used multivariate analyses to address Hospital Service Area geographic variations in healthcare utilization, and to adjust for nursing

home use, Medicaid receipt, comorbidity, and demographics.
Population Studied: National sample of Medicare beneficiaries, aged 65+ who died in 2001, had continuous coverage in the fee-for-service program, and were not in the End Stage Renal Disease Program. Blacks and Hispanics were over-sampled.
Principle Findings: Study sample (N=78,356) characteristics: mean age, 81 (range 66 – 98); female, 56%; White, 40%; Black, 36%; Hispanic, 11%; Other, 14%: 38% had 0 primary care visits; 22%, 1-2; 19%, 3-5; 10%, 6-8; and 11%, 9+ visits. More primary care visits in the pre-period were associated with fewer hospital days at end of life (15.3 days for those with no primary care visits vs. 13.4 for those with > 9 visits, P < 0.001), When stratified by gender, this association remained significant in women (15.9 days for those with no primary care visits vs. 13.2 days for those with > 9 visits, P < .001). The association was not significant for men (14.4 days for those with 0 visits, 14.1 for those with > 9 visits (P = 0.33). Among both genders with an ACSC diagnosis, those with more preceding primary care visits were less likely to have a preventable hospitalization for congestive heart failure (aOR = 0.82, 95% CI 0.74-0.92) and chronic obstructive pulmonary disease (aOR = 0.81, 95% CI 0.68-0.97). More primary care visits were also associated with a lower likelihood of any admission for women (aOR=0.78, 95% CI 0.72-0.84) but not for men (aOR=0.96, 95%CI 0.87-1.0).
Conclusions: More primary care visits in the preceding year are associated with fewer days in the hospital and fewer hospital admissions. Prior receipt of primary care is more strongly associated with lower use of hospital services at the end of life for women than for men.
Implications for Policy, Practice or Delivery: More access to primary care at the end of life may improve quality of life by decreasing hospital time, especially for women. Increased payment for primary care by Medicare could improve the quality of care at the end of life. Understanding gender differences in the use of healthcare services at the end of life could improve the effectiveness of healthcare delivery.
Funding Source: CMS, NIH

- **Gender Differences in Hospital Survival Rates for Medicare Beneficiaries Undergoing CABG: Does Hospital Performance Rankings Matter**

Steven Culler, Ph.D., April W. Simon, M.S.N.

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Research Objective: Previous studies examining gender differences in hospital mortality rates following coronary artery bypass graft (CABG) surgery provide inconclusive evidence concerning whether women are at greater risk of death than men because the study populations has varied greatly by geographic location, number of hospitals, inclusion/exclusion criteria, surgery specifications, and sample size. The purpose of this research is to examine gender differences in hospital survival rates using all Medicare beneficiaries undergoing CABG surgery without concomitant valve surgery for two years.
Study Design: A retrospective secondary data analysis was conducted using the Medicare Provider Analysis and Review (MedPar) Files for fiscal year 2003 and 2004. Separate logistic regression equations (controlling for 30 demographic characteristics, coronary risk factors and co-morbidities) were estimated to predict each Medicare beneficiary's probability of experiencing in hospital death in each fiscal year. Hospitals were ranked into quality quartiles (from best to worst) based on the number of lives saved (or lost), the difference between a hospital's risk-adjusted expected number of deaths and its observed number of deaths in each fiscal year. Average risk adjusted mortality rate by gender were calculated for every hospital in each fiscal year as follows: (the hospital's male/female observed mortality rate - the hospitals risk adjusted male/female expected mortality rate) + the national average mortality rate for male/females.
Population Studied: The study population consists of all US hospitals that performed at least 52 CABG surgeries during a fiscal year; hospitals not performing at least 17 CABG surgeries on women were excluded from the study because women were under represented in that hospitals patient sample. The final study sample consisted of 802 hospitals in FY03 and 768 hospitals in FY04 and a total of 256,638 hospitalizations of a Medicare beneficiary undergoing a CABG surgery. Males accounted for 66.5% and 66.9% of the admissions in FY2003 and FY2004, respectively.
Principle Findings: Overall, the results were very similar for FY2003 and FY2004 with women beneficiaries have a higher average expected

mortality rate in both years (4.7% versus 3.1% if FY2002 and 4.6% versus 3.0% in FY2004). Despite the decline in expect mortality rate over the two years, the female disadvantage in average hospital risk adjusted mortality rate remained constant (-1.53% FY2003 and -1.59% FY2004). After ranking hospitals into performance quartiles in both years, the female gender disadvantage in average hospital mortality rate across tiers increased from approximately –0.7% among top Tier hospitals to over -2.7% among hospitals ranked in the bottom Tier in both years. The increase in the gender difference in risk adjusted mortality rates between Tier 1 and Tier 4 hospitals was significantly ($p<0.001$) greater than 0.0%.
Conclusions: After risk adjusting, women have higher average in-hospital CABG mortality rates than men. The gender difference in average mortality rates was very stable across years and hospital performance tiers.
Implications for Policy, Practice or Delivery: Female Medicare beneficiaries can significantly improve their CABG survival rates relative to males by selecting to have the surgery performed in a top ranked hospital.

- Gender Differences in Healthcare-Seeking for Urinary Incontinence & the Impact of Socioeconomic Status: A Study of the Medicare Managed Care Population

Yue Li, Ph.D., Xueya Cai, M.A., Laurent G. Glance, M.D., Dana B. Mukamel, Ph.D.

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Research Objective: Urinary incontinence (UI) is a common health problem in community-dwelling older people, affecting between 11% and 34% elderly men and between 17% and 55% elderly women. For both genders, UI is associated with increased risk of morbidities such as pressure sores, urinary tract infections and falls with fractures, and can have detrimental impacts on the social and psychological well-beings of incontinent elders. A wide range of simple and effective UI treatments are available. However, many incontinent elders do not seek professional advice or treatment from their healthcare providers. In addition, although UI is twice as prevalent in elderly women as in elderly men, evidence suggests that women are substantially less likely to disclose their urine symptoms to a healthcare provider. Therefore, given the role of gender in the occurrence and management of UI, it is imperative to understand how male and female elders act in response to this medical condition, so that targeted educational interventions can be most effective in promoting knowledge, awareness and access to appropriate continence services. The present study describes gender variations in (1) UI care seeking behaviors and (2) actual receipt of UI treatment in a national cohort of Medicare managed care participants living in the community. We also explore how the gender discrepancy in UI management varies by age and individual socioeconomic status, given the increased prevalence and severity of UI with aging, and the impact of socioeconomic factors on primary care access and utilization.
Study Design: We obtained data from the 2003 and 2004 Medicare Health Outcomes Survey (HOS) follow-up cohorts. Multivariate generalized estimating equations (GEE) were used to estimate logistic regression on (1) patients with self-reported UI problem, to determine the independent impact of gender on the likelihood of discussing the UI problem with a health care practitioner; and on (2) patients with UI and having had such a discussion, to determine the independent impact of gender on the likelihood of actual receipt of a UI treatment. We estimated main effect regression models and models with interactions between gender and age, education or household income groups. Each model adjusted for respondents' magnitude of UI problem, race/ethnicity, marital status, Medicaid coverage, # of activities of daily living (ADLs), physical and mental component summaries of the SF-36 scales, and # of chronic conditions.
Population Studied: 28,724 community-dwelling, Medicare managed care participants who were 65 years or older and had self-reported UI problem in the last 6 months.
Principle Findings: The prevalence rate of self-reported UI was 31.5% for women, and 18.2% for men. Although incontinent women were more likely than incontinent men to have a 'big problem' of urine leakage (23.0% vs. 16.9%; $p<0.01$), incontinent female elders were less likely to discuss their problem with a health professional (Adj. OR=0.65, $p<0.01$). The gender difference in healthcare seeking is smaller among persons 80 years and older (predicted rate was 49.0% in women and 55.4% in men; difference=6.4%, $p<0.01$) than among persons age 65 to 79 years (gender difference=11.0%,

p<0.01); and larger among persons with annual household income greater than $80k (gender difference=17.8%, p<0.01) than among persons in lower income groups (gender difference=9.0%, p<0.01). On the other hand, among incontinent elders who had discussed their UI problem with a health professional (n=14,020), women were more likely to receive a treatment than men (Adj. OR=1.17, p<0.01), and the higher treatment rate in elderly women was more evident with younger age, higher education attainment or higher income level.
Conclusions: Although UI is more prevalent and severer among female elders, incontinent women were less likely to seek professional help than incontinent men. However, after discussing the UI problem with a health professional, incontinent female elders were more likely to receive a treatment. The gender differences may vary by age and socio-economic factors.
Implications for Policy, Practice or Delivery: Strategies to enhance care-seeking for urinary incontinence should consider the role of gender in personal knowledge, needs and behaviors for UI management in older adults, and the potential impact of socio-economic status on access to community continence services.

Women's Health: Research, Financing & Clinical Practice

Chair: Amal Khoury, Ph.D., M.P.H.

Sunday, June 3 • 3:00 p.m.-4:30 p.m.

▪ The Impact of Health Expenses on Older Women's Financial Security

Juliette Cubanski, Ph.D, M.P.P., M.P.H., Usha Ranji, M.S., Tricia Neuman, Sc.D.

Presented By: Juliette Cubanski, Ph.D, M.P.P., M.P.H., Principal Policy Analyst, The Henry J. Kaiser Family Foundation, 1330 G Street, NW, Washington, DC 20005, Phone: (202) 347-5270, Fax: (202) 639-9381, Email: JCubanski@kff.org

Research Objective: For older women, the burden of health care expenses can be troublesome. Compared to older men, older women have lower incomes, fewer assets, and less generous retirement benefits. Women also tend to live longer and experience more chronic, disabling conditions in older years and have fewer economic and social resources to obtain long-term care services when needed. This analysis examines the extent to which out-of-pocket spending for both acute medical care and long-term care places a large burden on older women and explores the differential impact of insurance coverage and income on subgroups of older women.
Study Design: We analyzed 2002 Medicare Current Beneficiary Survey data to compare the demographics of older women and older men and assess key differences in age, income, marital status, health status, and living arrangements. We examined out-of-pocket spending on health care services by aggregating spending on Medicare Parts A and B, supplemental insurance premiums, and all reported medical and long-term care services. Finally, we estimated the burden of out-of-pocket health care spending by calculating the ratio of annual out-of-pocket spending on medical care and insurance premiums to annual income.
Population Studied: Adults 65 years or older on Medicare from the 2002 Medicare Current Beneficiary Survey Cost and Use file, a representative sample of the Medicare population. The sample includes 6,195 women and 4,396 men living either in the community or in a facility.
Principle Findings: On average, total health expenses were $11,647 for women and $10,971 for men, varying considerably by insurance and socioeconomic factors. Total spending was inversely related to income, with lower-income women incurring far more than higher-income women. Spending was highest among women on Medicaid, lowest for women in Medicare HMOs, and similar for women with retiree coverage and Medigap. Older women paid on average 34% of their total health expenses out of pocket, compared to 30% for older men. This difference also translates into variations in spending burden. At the median, women spent 17% of income on out-of-pocket health expenses, compared to 14% for men. Older women with income $10,000 or less spent 26% of their income on health care compared to 8% for women with income above $40,000. Out-of-pocket health expenses among older women without supplemental insurance consumed 19% of income and accounted for 25% of income for women with Medigap. Older women on Medicare and Medicaid had the lowest out-of-pocket spending burden - 11% - while those in Medicare HMOs or with employer-sponsored insurance spent 14% of income on health expenses.
Conclusions: Despite its importance, Medicare falls short in protecting older women from potentially high out-of-pocket costs associated with their medical and long-term care needs,

particularly for those who are older, lack supplemental Medicare coverage, or need long-term care services.
Implications for Policy, Practice or Delivery: Reducing Medicare cost-sharing requirements, placing limits on out-of-pocket spending, and providing coverage for institutional long-term care beyond post-acute medical services would go far in protecting women from the burden of health care expenses.

- POWER: Project for an Ontario Women's Health Evidence Based Report Card

Asma Razzaq, B.Sc.H., M.P.H., Mandana Vahabi, Ph.D., Cynthia Damba, M.A.S.S., Arlene S. Bierman, M.D., M.S.

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Research Objective: To use a systematic and rigorous process to develop measures of the quality of health care for women that are 1. based on research evidence and expert opinion, 2. representative of a range of clinical conditions and health care issues that affect women, 3. relevant, scientifically sound, feasible, and are sensitive to equity issues such as gender, socioeconomic status, and ethnic disparities.
Study Design: A multi-method approach combining qualitative and quantitative methodologies was used. The qualitative component includes a comprehensive literature review and a modified Delphi process using a technical expert panel to identify and prioritize indicators for reporting. Quantitative analyses using existing administrative, survey, and registry data will provide the evidence to inform indicator selection and will be used to measure and report the final list of indicators.
Population Studied: Entire adult population (18+) in Ontario, Canada between 2001 and 2005 (approximately 9 million people each year).
Principle Findings: There will be two report cards, one in 2007 and one in 2008 as well as a web-based interactive data cube. In the first report card, indicators will be measured and reported in five areas (access to care, burden of illness, cardiovascular health, cancer, and depression) in the context of women's health. For access to care, 27 indicators were presented to the panel, and after two rounds of rating, they chose 15 indicators for inclusion in the report card. For burden of illness, 23 indicators were presented for rating, and of these, 20 were chosen by the panel members for inclusion in the report. Similar processes will take place for the remaining three chapters over the next few months, and the final list of indicators for each of these areas will be available in time for the conference.
Conclusions: Although performance measures are ubiquitous in the literature and have proliferated across the continuum of care, they have not been stratified or reported in a systematic and routine manner for women's health. Using a comprehensive literature review, a rigorous structured panel process, and routinely reported population based health data for Ontario, it was possible to develop a comprehensive set of evidence based indicators for assessing, monitoring, and evaluating women's health status, outcomes, health service utilization, and access to care.
Implications for Policy, Practice or Delivery: This is the first set of comprehensive performance measurement and quality of care indicators for women's health that spans the continuum of care. These indicators will improve existing knowledge of women's health problems, needs, and health care utilization. A focus on gender will have the added benefit of providing evidence for improving men's health as well. Because there are significant inequities in health among subgroups of mean and women associated with socioeconomic status, ethnicity, and geography, it is important to specifically assess performance for these groups. A specific and combined focus on gender and equity is a critical benefit of the POWER study that will contribute to efforts to assess performance; prioritize, design, and implement interventions; and, track and monitor progress.
Funding Source: Ministry of Health and Long Term Care

- Urban/Rural Differences in Survival among Medicare Beneficiaries with Breast Cancer

Melony Sorbero, Ph.D., M.S., M.P.H., Lisa R. Shugarman, Ph.D., Haijun Tian, Ph.D., Arvind K. Jain, M.S., J. Scott Ashwood, M.A.,

Presented By: Melony Sorbero, Ph.D., M.S., M.P.H., Health Policy Researcher, RAND Corporation, 4570 Fifth Avenue, Pittsburgh, PA 15213,Phone: (412) 683-2300, Fax: (412) 683-2800, Email: msorbero@rand.org

Research Objective: Limited research exists on urban/rural differences in survival for breast

cancer patients. Socio-economic differences across regions and lower local supply of certain types of cancer services resulting in reduced access to such services by rural elders could result in urban and rural differences in survival among breast cancer patients. This study assessed the relationship between urban/rural residence and risk of mortality among female Medicare beneficiaries with breast cancer.
Study Design: Secondary data analysis using Surveillance, Epidemiology, and End Results (SEER) data merged with Medicare claims and linked to the Area Resource File. Rural-Urban Commuting Area Codes were used to create 4 residence categories: urban, large rural city, small rural town, and isolated small rural town. Proportional hazards models were used to test hypothesized relationships between community characteristics and overall survival, controlling for a variety of patient characteristics, tumor characteristics, and community socioeconomic characteristics and provider supply.
Population Studied: Female Medicare beneficiaries age 65 and older residing in a SEER region at the time of their breast cancer or ductal carcinoma in situ diagnosis between 1995 and 1999 and followed until December 2003. We restricted our sample to those women for whom breast cancer was their first diagnosed cancer and were continuously enrolled in both Medicare Part A & B for the year prior to diagnosis and 8 months after diagnosis. Medicare beneficiaries enrolled in managed care, with end-stage renal disease, or eligible for Medicare due to disability were excluded from the sample (N=32,626).
Principle Findings: Controlling for individual demographics, comorbidity and year of diagnosis, breast cancer patients in large ($p<.01$) and small ($p<.01$) (but not isolated) rural areas experienced poorer survival than did women in urban areas. This relationship was no longer significant when tumor characteristics, measures of socioeconomic status and measures of supply were included in the analysis. Living in a census tract with a median income of at least $30,000 was associated with improved survival ($p<.01$), while being a Medicaid recipient was associated with shorter survival ($p<.01$). Residing in a county with partial or whole Health Professional Shortage Area designation was associated with shorter survival ($p<.05$), while the greater supply of hospital oncology services was associated with increased survival ($p<.05$). The supply of radiation oncology services and hospital-based mammography services was not significantly associated with survival.
Conclusions: These findings suggest individual and census tract-level socioeconomic factors as well as some measures of provider supply, rather than geographic residence, play a role in survival for older women with breast cancer.
Implications for Policy, Practice or Delivery: Further work should identify whether cancer treatment is available in a reasonable distance for breast cancer patients and develop policies to address provider shortages in both rural and urban areas.
Funding Source: HRSA

- **Are Women's Health Concerns Prioritized at the NIH & the FDA?**

Nicole Quon

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Research Objective: Scientific agencies such as the National Institutes of Health (NIH) and the Food and Drug Administration (FDA) have historically relied on scientists and based decisions on scientific evidence, which suggests that these agencies are less likely to be influenced by politics that are shaped by values. Yet women's health advocates who relied on frames of gender inequities successfully lobbied for policy changes in the 1990s, including establishing offices dedicated to women's health, mandating the inclusion of women in clinical research, and increasing research funding for breast cancer. Less is known about the relative allocation of NIH and FDA resources for other diseases on the women's health agenda, though. This study examines whether measures related to advocacy, politics, public attention, and public health needs are related to the amount of resources dedicated to FDA drug approval for conditions that affect women and women's health research in the NIH intramural program and NIH extramural program.
Study Design: The women's health agenda was determined by examining materials from women's health advocacy groups. Relevant NIH research grants were identified through keyword searches of the CRISP database available online while data on new drug approvals came from the Tufts Center for the Study of Drug Development. Independent measures on Congressional oversight, leadership in Congress, women's health advocacy, media attention, scientific journal attention, agency characteristics, and

public health burden were also collected from public sources.
Population Studied: NIH grants and FDA new drug approvals on women's health issues from the early 1970s to the present.
Principle Findings: The speed of new drug review decreased during the study period, but drugs for conditions that were on the women's health agenda were not reviewed more quickly than other types of drugs. A number of factors were related to NIH intramural and extramural resource allocation for diseases on the women's health agenda, including measures of Congressional oversight and women's health advocacy, the increasing number of women in key Congressional oversight committees, and having women in senior NIH positions.
Conclusions: Both agencies responded to requests to establish formal communication channels with the advocacy community and changed the rules regarding participation in research. The results also suggested that political factors affected NIH priority setting for women's health issues, although FDA prioritization of new drug approval for women's health did not seem to change.
Implications for Policy, Practice or Delivery: The NIH and the FDA are not insulated from political pressure, despite the underlying preferences of these agencies to rely on scientific evidence and expertise. The increasing number of women in elected offices and administrative positions could have important implications for attention to women's health issues.
Funding Source: National Science Foundation

- **The Direct and Indirect Cost Burden of Clinically Significant & Symptomatic Uterine Fibroids**

Ronald J. Ozminkowski, Ph.D., Ronald J. Ozminkowski, Ph.D., Ginger Smith Carls, M.A., Shaohung Wang, Ph.D., Teresa B. Gibson, Ph.D., Elizabeth A. Stewart, M.D.

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Research Objective: Estimate annual direct (medical expenditure) and indirect (absenteeism and short-term disability) costs for women with uterine fibroids (UF).
Study Design: We compared 12-month direct costs among women aged 18-54 with clinically-meaningful UF (admission, emergency visit, or >2 office visits >30 days apart with a UF diagnosis) to a 1:1 propensity score matched cohort of women without UF, using the MarketScan Commercial Claims and Encounters insurance database data from for 2000 – 2004. We also compared indirect costs for the sub-sample of women with available data. Exponential conditional regression analysis controlled for confounding factors, and costs were adjusted to 2004 levels.
Population Studied: Women age 25 - 54 in private insurance plans in the U.S.
Principle Findings: Sample sizes for the direct and indirect costs analyses were 38,020 and 1,820, respectively. Mean 12-month direct costs for women in the UF group were $11,720 vs. $3,257 for controls (women without diagnosed or treated fibroids). Mean 12-month indirect costs were $11,752 and $8,083 for women in the UF group and controls, respectively. Estimated direct costs attributable to UF were therefore $8,463 ($p<0.001$) and indirect costs were $3,669 ($p<0.001$). Employers' share of direct costs ranged from 84.1% to 87.5%.
Conclusions: Direct and indirect costs of uterine fibroids represent a substantial burden to employers. UF is a costly disorder and merits thought as interventions are considered to improve women's health and productivity.
Implications for Policy, Practice or Delivery: The high costs of uterine fibroids, mainly due to surgical treatment and associated productivity losses, suggest that non-surgical interventions should be considered. Employers should also consider offering programs to help female workers better manage this condition.
Funding Source: GE Healthcare

Health Care Markets & Financing

Public Policy & Health Care Markets: Intended & Unintended Effects

Chair: Kathleen Carey, Ph.D.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

- **Spillover Effects of State Mandated-Benefit Laws: the Case of Outpatient Breast Cancer Surgery**

John Bian, Ph.D., Joseph Lipscomb, Ph.D., Michelle M. Mello, J.D., Ph.D.

Presented By: John Bian, Ph.D., Health Services Researcher, Epidemiology and Surveillance Research, American Cancer Society, 1599 Clifton Road NE, Atlanta, GA 30329-4251, Phone: (404) 329-4312, Fax: (404) 327-6450, Email: john.bian@cancer.org

Research Objective: State mandated-benefit laws require health insurers to cover particular services. Although mandated-benefit laws passed by states formally affect only state-regulated insurers, they may also affect patient care covered by other insurers by creating a general shift in physicians' standard of practice. Breast cancer treatment is one area in which states have been particularly active in passing mandated-benefit laws, including laws requiring coverage for inpatient breast cancer surgery. However, little is known about the effects of these laws. This study investigated the potential spillover effects of state laws regulating the minimum length of hospital stay for mastectomy and breast-conserving surgery with lymph node dissection (BCS/LND) by examining outpatient utilization of the two procedures among elderly Medicare fee-for-service (FFS) beneficiaries not formally covered by the laws.
Study Design: Using a difference-in-differences (DD) design, we first examined the overall spillover effects of state laws and then investigated whether these effects varied over time. Linear probability models with county and time fixed effects were used to analyze the effects for mastectomy and BCS/LND patients separately, using Huber clustered (county) standard errors correction. The main data were linked 1993-2002 Surveillance, Epidemiology and End Results (SEER) registries and Medicare claims data. The analyses included 8 states with SEER registries prior to 2000. We conducted a comprehensive review of state breast cancer surgery laws and regulations for these states. Additional variables were extracted from a health maintenance organization (HMO) enrollment file and the Area Resource File.
Population Studied: We identified a breast cancer cohort including women >= 65 who were Medicare FFS patients at diagnosis, were found to have unilateral stage 0-II breast cancer, and received mastectomy or BCS/LND as first-course treatment. The dependent variable was the delivery setting (inpatient or outpatient), determined from claims data. Covariates were patients' demographic/clinical characteristics and time-varying county-level variables including HMO penetration.

Principle Findings: Four of the 8 states had no breast cancer surgery law during 1993-2002, and 4 had laws taking effect during 1997-1999. Fourteen percent of 24249 mastectomy patients and 64% of 16039 BCS/LND patients received surgery on an outpatient basis. The DD analysis of the overall spillover effects suggested that the laws decreased utilization of outpatient mastectomy, on average, by 4 percentage points ($P<0.05$), but did not significantly affect utilization of outpatient BCS/LND. Our analysis of the time-varying effects of the laws found that the laws lowered utilization of outpatient mastectomy, by 5 percentage points ($P<0.01$), only in the first 12 months post-adoption but had no significant impact thereafter. In contrast, there was no significantly time-varying effect on utilization of outpatient BCS/LND during the post-adoption period.
Conclusions: State mandated-benefit laws had a significant but transient spillover effect on utilization of outpatient mastectomy among elderly Medicare FFS beneficiaries. By adopting mandated-benefit laws, states may indirectly exert regulatory influence over the care of patients insured by entities that are not formally subject to state regulation.
Implications for Policy, Practice or Delivery: As the Breast Cancer Patient Protection Act of 2005 (a bill) has highlighted the public policy concern about outpatient breast cancer surgery, our findings provide the public with timely evidence for informed decision-making.

- **Does Non-Price Competition among Managed Care Plans Improve Quality of Care? Evidence from the New York State Children's Health Insurance Program**

Hangsheng Liu, M.S., Charles E. Phelps, Ph.D.

Presented By: Hangsheng Liu, M.S., Doctoral Candidate in Health Services Research & Policy, Community and Preventive Medicine, University of Rochester, 601 Elmwood Avenue, Box 644, Rochester, NY 14642, Email: Hangsheng_Liu@urmc.rochester.edu

Research Objective: Despite the states' increasing dependence on managed care to provide comprehensive coverage for low-income population, little has been done about the effect of managed care non-price competition on quality of care for this population. We examine this effect in the New York State Children's Health Insurance Program (SCHIP) market, where managed care is mandatory and the state government sets premium for each plan

separately based on that plan's previous cost experience and the regional average cost.
Study Design: Since previous studies demonstrate a positive effect of non-price hospital competition on quality of care, we hypothesize that price is not a constraint on quality production in the NY SCHIP market and non-price managed care competition is positively correlated with quality of care. Each market is defined as a county in the state, and competition is measured as the number of managed care plans in the market. Quality of care is measured using three Consumer Assessment of Health Plans Survey (CAHPS) scores and three Health Plan Employer Data and Information Set (HEDIS) scores. Taking into consideration the endogenous relationship between competition and quality of care, we apply two-stage least squares regression using population as an instrument. The data sources include: the US Census 2000; the 2002 New York State Managed Care Plan Performance Report; and the 2001 New York State Managed Care Annual Enrollment Report.
Principle Findings: We find a negative association between the number of managed care plans in a market and quality of care. An additional managed care plan in the market results in 0.30 to 1.05 unit changes in percentage in "provider communication", "problems with getting care needed", "problems with services", "use of appropriate medications for people with asthma", and "childhood immunization". Further investigation shows that quality of care is positively correlated with the price - production cost ratio, a measure of reimbursement level, and the correlation coefficients range from 0.67 to 0.82. The sub-analysis of markets within the same pricing regions shows a statistically significant increase in "preventive care visits" with an increase in competition. Compared to for-profit plans, non-profit plans show higher quality in "provider communication", "child immunization", and "problems with getting care needed". Larger plans have fewer "problems with services", more "preventive care visits", but worse "provider communication". All the findings are statistically significant at the 5% level.
Conclusions: Overall, increasing competition is associated with decreasing quality of care, indicating the pricing policy is a constraint on quality production. The relationship between competition and quality is modified by the level and type of payment, while competition might have a positive effect on quality of care within the same pricing regions.
Implications for Policy, Practice or Delivery: In order to allocate resources appropriately across markets, the government could adjust prices according to both production cost and the target quality level. One possible mechanism is through implementing pay for performance programs for managed care plans, which can improve quality of care. Since labor cost accounts for a major part of the production cost of medical care, the local labor cost can be used as a reference for price setting.

- **Medical Expenditure Burdens: The Effects of Tax Subsidies, the Within-Year Concentration of Expenditures, and More**

Thomas Selden, Ph.D.

Presented By: Thomas Selden, Ph.D., Senior Economist, Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, Phone: (301)427-1677, Fax: (301)427-1278, Email: tselden@ahrq.gov

Research Objective: Numerous health economic studies have examined out-of-pocket expenditures across sub-groups of the U.S. population, estimating the prevalence of high burdens (i.e., out-of-pocket spending as a share of income). The objective of this paper is to extend the literature in 3 key directions: (1) more fully accounting for tax subsidies, (2) examining the within-year concentration of medical expenditures, and (3) exploring the potential burden of medical bills that are not paid in full.
Study Design: The study uses data from the 2003 and 2004 Medical Expenditure Panel Survey. In addition to presenting conventional burden estimates, the study accounts for tax subsidies that might reduce the prevalence of burden: subsidies for out-of-pocket premium contributions, flexible spending accounts, and the deductibility of medical expenditures exceeding 7.5 percent of adjusted gross income. The study also examines whether families encounter periods during the year when medical expenditures are particularly large, causing burdens measured at the monthly or quarterly level to be a high percentage of income. Intra-year burdens might be especially problematic to the extent that they coincide with periods of unpaid absence from work (due to the health of the worker or to care for a family member). Finally, whereas conventional analyses ignore unpaid medical bills, these may nevertheless represent an important source of burden. Families with unpaid medical bills might be

accumulating medical debt, damaging their credit scores, facing restricted access to care, and/or suffering stigma associated with "charity care." An upper bound on the extent of such burdens can be formed by including unpaid medical bills in the calculation of family burdens (just as a lower bound is to ignore unpaid bills entirely).
Population Studied: The study examines the civilian noninstitutionalized U.S. population under age 65. The study also examines subgroups of this population defined by age, poverty level, race/ethnicity, health risks, and insurance status.
Principle Findings: Preliminary results suggest that accounting for tax subsidies lowers the prevalence of burdens exceeding 20 percent of after-tax income only modestly (from 7.3 percent to 6.2 percent). The effect, however, is very unequally distributed, providing a substantial benefit only to higher income families. Analysis of intra-year burdens shows that, on average, nearly half of a family's annual out-of-pocket expenditures on care occur within a single month of the year. This can be particularly troublesome for lower-income families, which lack the financial assets to smooth consumption over the year and which are particularly prone to income shortfalls during months of peak health consumption. Nationally, 28.5 percent of all families experience at least one month in which burdens exceed 20 percent of monthly income, and for the poor this share is over 50 percent. Finally, findings regarding unpaid medical bills suggest that most families with such bills are already paying more than 20 percent of their after-tax income, so that adding in the burden of unpaid medical bills increases the prevalence of 20 percent burdens only modestly. Measuring the impact of such bills at higher income thresholds is the subject of my on-going research.
Conclusions: The study changes substantially our perception of medical expenditure burdens in the U.S. Tax subsidies help to lower the burdens of higher-income families, but have very little impact on lower-income families. Moreover, to the extent that lower-income families care about monthly burdens as much or more than burdens averaged over the year, the study reveals a very high burden prevalence among lower-income Americans.
Implications for Policy, Practice or Delivery: It is hoped that detailed analysis of medical expenditure burdens may offer useful insights into the nation's current health care system and provide an impetus for reforms that would better target lower-income families facing financial strain from obtaining health care.
Funding Source: AHRQ

- The Impact of BBA, HMOs, & Hospital Competition on Quality of Cardiac Care

Hsueh-Fen Chen, A.B.D., Gloria Bazzoli, Ph.D.

Presented By: Hsueh-Fen Chen, A.B.D., Research Associate, Health Administration, Virginia Commonwealth University, Grant House 1008 East Clay Street, Richmond, VA 23298, Phone: (804) 827-1811, Fax: (804) 828-1894, Email: chenh@vcu.edu

Research Objective: To examine the effect of Balanced Budget Act (BBA) and Health Maintenance Organizations (HMO) penetration on quality of cardiac care, and how hospital competition mediates these effects.
Study Design: Economic theory and a longitudinal empirical analysis across eight years were applied to the study. The unit of analysis is the hospital. This study sorted 53 cardiac DRG codes into three groups—high-intensive surgery, low/moderate intensive surgery, and medical services and examined the effect of BBA, HMO market share, and hospital competition on quality of care for each level of cardiac service. The dependent variable was the ratio of observed to predicted in-hospital deaths. The primary independent variables of interest were a BBA financial impact index and HMO penetration. Hospital competition was a mediator in this study. In order to avoid the potential endogenous measurement, the BBA impact index was measured based on a simulator of BBA, BBRA, and BIPA effects developed by the American Hospital Association (AHA). Hospital competition was measured by the sum of squared market share based on predicted patient admissions in given a market. Fixed effect estimation was used to control the unobserved factors.
Population Studied: All nonfederal, general short-term urban hospitals included in the Health Care Cost and Utilization Project State Inpatient Data (HCUP-SID) data from 1995-2002 for the states of AZ, CA, CO, FL, NJ, NY, WA, and WI. The sample was further restricted to hospitals that had at least 5 admissions of any level of cardiac services. The study sample for each cardiac service group is varied. Dependent variables were constructed with HCUP-SID data. BBA impact index was constructed with Medicare Cost Report and the AHA BBA simulator. HMO penetration at MSA level was

provided by the HealthLeader-InterStudy. Hospital competition was constructed with HCUP-SID and AHA annual survey, which provide the patients and hospitals' zip code, respectively. Finally, HCUP-SID, AHA Annual Survey, PPS impact file, and Area Resource File (ARF) provide hospital, and market variables for the control variables.
Principle Findings: After controlling for unobserved and other factors, BBA and HMO penetration expectedly have a negative impact on quality of cardiac care. Hospital competition expectedly mitigates the negative effect of BBA on quality of care. However, hospital competition expectedly worsens the negative effect of HMO penetration on quality of care.
Conclusions: The results of this study expectedly follow the economy theory that hospital competition leads to high quality of care in a fixed-price market, but leads to low quality of care in the negotiated-price market.
Implications for Policy, Practice or Delivery: The hospital industry has consolidated substantially over the last decade, reducing hospital competition in many markets. The overall impact of hospital consolidation on quality of care in a market depends on which pricing policy dominates. In markets dominated by Medicare patients, reduced competition likely has a detrimental quality effect, whereas in markets dominated by private sector HMOs, reduced hospital competition may limit adverse quality effects.
Funding Source: AHRQ

- **Certificate of Need & the Price Paid for Inpatient Services for Privately Insured Patients**

Patricia Ketsche, Ph.D., M.H.A., M.B.A., Mei Zhou, M.A., Dawuud Ujamaa, M.S.

Presented By: Patricia Ketsche, Ph.D., M.H.A., M.B.A., Associate Professor, Institute of Health Administration and Georgia Health Policy Center, Georgia State University, PO Box 3998, Atlanta, GA 30302-3988, Phone: 404-651-2993, Fax: 404-651-1230, Email: pketsche@gsu.edu

Research Objective: Certificate of Need (CON) laws were intended to slow the rate of growth of health care costs as part of a health planning strategy that uses regulation to manage the allocation of health care resources and prevent duplication of services. CON creates barriers to entry that convey monopoly power to incumbent health care providers. Economic theory suggests that unregulated monopolies have higher prices and lower quality than firms in more competitive markets. However, competition may limit the ability of facilities to exploit economics of scale and scope. The increased costs and decreased quality associated with monopoly power may be offset by the decreased costs and increased quality resulting from economies of scale and scope. We seek to measure the effect of CON on the prices paid for care for privately insured patients.
Study Design: We compare the prices for private pay patients in 9 states with varying degrees of CON regulation, controlling for characteristics of the state, market, patient, and episode of care. Three of these states have no CON regulation, while the others were surveyed to determine the scope and rigor of their regulatory processes. Hospital markets are defined using hospital discharge data to identify patient flows, and the level of competition is measured using the Herfindahl index. Health care claims from large employers and insurers from the Thomson MEDSTAT Market scan database (2002 & 2004) identify the cost to privately paying patients for specific services. A fixed effects model of costs controlled for characteristics of a state, market, patient, and episode of care to isolate the marginal effects of CON regulation on hospital inpatient costs. We estimate the effect of CON in two ways: as a dichotomous variable and as a scaled variable based on the scope and rigor of the regulatory processes in the state.
Population Studied: Privately insured patients in Colorado, Florida, Georgia, Iowa, Maine, Washington, Utah, West Virginia, and Wisconsin.
Principle Findings: There is considerable variation in the regulatory processes across states with CON laws. Markets in states with CON are significantly less competitive than markets in states without CON, and lower levels of competition are associated with higher costs. Controlling for competition effects, the presence of CON regulation is associated with higher private inpatient costs. The effect is robust with respect to model specification, measures of CON rigor, and diagnoses. The number of ambulatory surgery centers per capita in a market is positively related to costs for surgical procedures, consistent with the idea that the presence of ambulatory surgery centers increases inpatient acuity level.
Conclusions: These results are consistent with economic theory that suggest CON acts as a barrier to competition and allows incumbent

hospitals to use the resulting market power to raise prices for private patients.
Implications for Policy, Practice or Delivery: State policy makers using CON as a tool to manage the allocation of health care resources may need to consider simultaneous regulation of prices in the private sector to limit the effect of monopoly power on overall health care costs.
Funding Source: State of Georgia

How Does Market Structure Affect Access to Care & Quality?

Chair: Alison Evans Cuellar, Ph.D., M.B.A.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

- Does Spending More on Health Care Lead to Better Quality and Outcomes? Care for Colorectal Cancer

Mary Beth Landrum, Ph.D., Ellen Meara, Ph.D., Amitabh Chandra, Ph.D., Ed Guadagnoli, Ph.D., Nancy L. Keating, M.D., M.P.H.

Presented By: Mary Beth Landrum, Ph.D., Associate Professor of Biostatistics, Health Care Policy, Harvard Medical School, 180 Longwood Ave, Boston, MA 02115, Phone: (617) 432-2460, Fax: (617) 432-2563, Email: landrum@hcp.med.harvard.edu

Research Objective: Recent research suggests area-level spending on medical care is associated with increased use of services, but not improved patient outcomes or quality of care. However, few studies have examined whether increased use of intensive procedures in high-spending areas is concentrated among indicated, discretionary, or contraindicated cases. If high-spending areas have higher rates of both effective, ineffective and harmful care, a complement to cost-containment strategies might be policies aimed at improving use of effective therapies among patients who are most likely to benefit. We examined whether area-level spending influences quality of care, use of therapies that are effective, ineffective, or of uncertain benefit, and health outcomes in patients with colorectal cancer.
Study Design: We categorized spending based on a publicly-available index of intensity of inpatient care at the end-of-life (EOL-IEI). By focusing on a population with similar life expectancy, this index reflects the portion of variation in area-level spending that is attributable to differences in practice patterns as opposed to differences in severity of illness. We used regression models to estimate the association between EOL-IEI and a) quality of care (using six measures of the quality of screening, adjuvant therapy and surveillance care); b) use of chemotherapy; and c) overall and cancer-specific mortality, controlling for patient characteristics. Models for use of chemotherapy and mortality were fit in subsets of patients defined by stage at diagnosis to understand the use of therapies and associated outcomes in cases where treatments have been shown to be effective, ineffective, or of uncertain benefit.
Population Studied: We used the Surveillance, Epidemiology, and End Results (SEER)-Medicare data to obtain a population-based sample of 55,549 fee-for-service Medicare beneficiaries diagnosed with colorectal cancer during 1992-1999.
Principle Findings: Higher EOL-IEI was not associated with improvements for 4 of 6 quality measures. Colon cancer patients in high-spending areas more often received chemotherapy when recommended (stage III, change in probability for each one-quintile increase in EOL-IEI=1.8 percentage points; 95% CI=[0.8, 2.8]); not indicated (stage I, change in probability=0.6% [0.2, 0.9]); and of uncertain benefit (stage II, change in probability=1.0 [0.2, 1.8]). Patients undergoing chemotherapy in areas with the highest level of end-of-life inpatient expenditures were approximately 0.6 years older and had higher levels of comorbid illness compared to those in the lowest quintile ($P<0.001$ for both). Area-level spending was associated with increased all-cause mortality for stage II colorectal cancer patients (change in probability=0.6% [0.1, 1.2]), but not other stages. Patients with stage IV cancers in higher-spending areas had fewer colorectal cancer deaths (change in probability=-0.6% [-1.1, -0.02]), but higher non-cancer mortality (change in probability=0.8% [0.3, 1.3]).
Conclusions: High spending areas were more likely to provide anti-cancer therapies when it is beneficial and when is it not beneficial and potentially harmful so that patient outcomes across areas were equivalent.
Implications for Policy, Practice or Delivery: Policies aimed at improving use of effective therapies may be more likely to improve patient outcomes while limiting wasteful spending on ineffective care than policies that simply aim to equalize the amount of care provided across areas.
Funding Source: NCI, Doris Duke Charitable Foundation, National Institute of Aging

- **Rural Safety Net Provision and Hospital Care in 11 States**

Patricia Ketsche, Ph.D., M.H.A., M.B.A., E.Kathleen Adams, Ph.D., Karen Minyard, Ph.D.

Presented By: Patricia Ketsche, Ph.D., M.H.A., M.B.A., Associate Professor, Institute of Health Administration and Georgia Health Policy Center, Georgia State University, PO Box 3998, Atlanta, GA 30302-3988, Phone: 404-651-2993, Fax: 404-651-1230, Email: pketsche@gsu.edu

Research Objective: Access to primary care may reduce the necessity for hospital care, especially the number of ambulatory care sensitive (ACS) admissions. This study assesses the effect of safety net provision of primary care on these outcomes. Given disparate access and care seeking behavior among rural residents we test for a differential impact of safety net clinics on hospital admissions in more versus less rural areas.
Study Design: We use hospital discharge data on total and ACS admissions and patient days by payer type from 11 states. We link hospital records to multiple data sources: American Hospital Association (AHA) data, Primary Care Service Area (PCSA) data for population and market level controls and the availability of primary care safety net providers (clinics) within the local service area, and Small Area Health Insurance Estimates (SAHIE) of the number of uninsured within the service area. We examine the share of admissions that are ACS, population adjusted admissions and ACS admission rates by payer type in rural versus non-rural areas. We use rural residents as a share of PCSA population to measure rurality.
Population Studied: The sample of 1133 hospitals in 11 states is nationally representative of hospitals in terms of size and ownership characteristics.
Principle Findings: As the hospital service area population becomes more rural, an increasing share of admissions is derived from public payers and classified as ACS admissions. Rural-urban differences in ACS admission rates appear to be determined at least in part by less (?) bypassing of local rural hospitals among ACS versus other types of admissions. Based on descriptive analysis in communities with less than 50 percent rural populations the presence of a primary care safety net provider is unrelated to the share of hospitalizations that are ACS admissions while service areas with majority rural populations exhibit a positive relationship between the share of ACS admissions and the presence of a safety net provider, opposite the hypothesized direction. We use multivariate analysis to partially address the high probability that clinic location is endogenous with the share of the population prone to having an ACS admission. Based on this analysis we find no measurable effect of the presence of safety net providers on the proportion of hospital admissions that are ACS. However, we find strong evidence that the presence of primary care safety net providers within the PCSA reduces the rate of ACS admissions and particularly the rate of ACS admissions per 1000 public beneficiaries when adjusted by service area population. Moreover, these effects are more pronounced in service areas that are majority rural.
Conclusions: The presence of primary care safety net providers reduces ACS admissions per 1000 residents and publicly funded ACS admissions per 1000 beneficiaries, particularly in rural communities, suggesting improved access to primary care among these patients.
Implications for Policy, Practice or Delivery: Public funding for primary care safety net providers results in an offsetting savings for hospital care among the public beneficiaries who gain access to primary and preventive services.
Funding Source: HRSA

- **Is There a Relationship Between HMO Competition & Quality of Care? Evidence from the California Medicare Population**

Feng Zeng, Ph.D., June O'Leary, Ph.D., Glenn Melnick, Ph.D.

Presented By: Feng Zeng, Ph.D., Senior Analytical Consultant, Thomson Medstat, 1750 Creekside Oaks Drive, Suite 100, Sacramento, CA 95825, Phone: (916) 576-6241, Email: feng.zeng@thomson.com

Research Objective: To investigate whether competition among Medicare health maintenance organizations (HMOs) is related to the quality of care for HMO and FFS beneficiaries.
Study Design: A two-part model with fixed effects was estimated for an HMO cohort and a FFS (fee-for-service) cohort, separately. The unit of analysis was person-year. The dependent variable, quality of care, was measured by the hospitalization rate for 15 ambulatory care sensitive conditions (ACSCs). Providing patients with timely and appropriate access to outpatient care can reduce hospitalizations for ACSCs, which include disease such as diabetes and

congestive heart failure. The number of HMOs and Hirschman-Herfindahl Index (HHI) are used to measure HMO competition at the county level. The first part of the model is a logit, where the dependent variable is the probability of having one or more hospitalizations for any of the 15 ACSCs in a given year. The second part of the model is an ordinary least squares regression, where the dependent variable is the total length of stay due to all hospitalizations for ACSCs in a given year. Each model was estimated controlling for age, gender, race, disability as the original reason for entitlement, Medicaid eligibility, death in the current year or the next year, the county of residence and HMO penetration rate in the county.
Population Studied: Inpatient discharge data from the California Office of Statewide Health Planning and Development was linked to Medicare enrollment data from the Center for Medicare and Medicaid Services. Two cohorts of Medicare beneficiaries, HMO and FFS, were identified. To be included, beneficiaries either needed to be continuously enrolled in a Medicare HMO, or continuously enrolled in Medicare FFS from January 1996 through December 2000 in one of 22 urban California counties that had at least 1,000 Medicare HMO beneficiaries in a year. A 10 percent stratified random sample was taken resulting in 46,085 HMO beneficiaries and 92,719 FFS beneficiaries in 1996. The entire study period covered 222,783 HMO person-years and 445,733 FFS person-years.
Principle Findings: The coefficient associated with the most competitive market was negative but insignificant compared with the least competitive market in the HMO logit model. In the FFS logit model, the coefficient associated with the most competitive market was negative and significant only when the number of HMOs is used to measure market competition (-0.18, p value = 0.02). The coefficients of the most competitive market were insignificant for both the HMO and FFS regression models of length of stay.
Conclusions: Competition among California Medicare HMOs was not related to the quality of care for HMO beneficiaries as measured by the ACSC hospitalization rate and length of stay.
Implications for Policy, Practice or Delivery: Research has found that competition among HMOs lowers premiums, raising concern for the impact on access to and quality of care. This research found no evidence that competition among California Medicare HMOs hurt or improved quality of care as measured by ACSCs.

Funding Source: USC

- Entry Pricing and Product Quality :Evidence from the Pharmaceutical Industry

Jie Chen, Ph.D. Candidate, John Rizzo, Ph.D.

Presented By: Jie Chen, Ph.D. Candidate, Economics, Stony Brook University, L2171Ax 700 Health Science Drive, Stony Brook, NY 11790, Phone: (631) 805-4322, Email: jiechen@ic.sunysb.edu

Research Objective: To explore the entry pricing strategies of pharmaceutical manufacturers. We hypothesize that the entry price should depend on the interaction between the therapeutic quality of the new agent and the degree of product differentiation in the market and the extent to consumers engage in repeat purchase arrangements.
Study Design: We use a nationally representative data set on drug utilization and expenditures combined with a physician survey on the quality attributes of drugs to examine the effect of the drug quality on pharmaceutical pricing strategies and to test the hypotheses described above. Our quality measure is a comprehensive physician assessment of drug therapeutic attributes, and it provides an overall index of the drug efficacy and side effects. We examine two therapeutic drug product markets: non-steroidal anti-inflammatory drugs (NSAIDs) and antidepressants during the period 1998 to 2002.
Population Studied: This analysis is based on data from the 1998-2002 Medical Expenditure Panel Survey (MEPS) conducted by the Agency for Healthcare Research and Quality (AHRQ).The samples we include in this study are subjects who are aged 18 years and older and who have any health insurance during the survey year.
Principle Findings: In a more differentiated, less repeat-purchase market such as NSAIDs, high quality entrants engage in a skimming strategy. In a less-differentiated, more repeat-purchase market such as antidepressants, high-quality entrants engage in a penetration strategy.
Conclusions: Entrants may engage in skimming or penetration pricing strategies, depending on conditions in the market.
Implications for Policy, Practice or Delivery: Pharmaceutical expenditures have risen substantially during the past decade. The prices of pharmaceuticals in particular have generated considerable and often acrimonious debate. This study shows that the policy makers can should

not ignore the market condition when they are trying to intervene the pharmacy pricing regulations.

- **Reduction of Healthcare Disparities with Market Competition: The Case of Cardiac Angiography in New Jersey**

Derek DeLia, Ph.D., Joel Cantor, Sc.D., Amy Tiedemann, Ph.D., Cecilia Huang, Ph.D.

Presented By: Derek DeLia, Ph.D., Assistant Professor/Senior Policy Analyst, Rutgers Center for State Health Policy, 55 Comercial Avenue, New Bruswick, NJ 08901-1340, Phone: (732) 932-4671, Fax: (732) 932-0069,
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Research Objective: In 1997, New Jersey reformed its Certificate of Need (CON) regulations to encourage the provision of cardiac angiography (CA) to African American and other underserved populations. The reform authorized the licensure of new hospital-based CA units designed for "low-risk" patients. Written plans to serve underserved populations were among the conditions for licensure of new CA facilities. By more than doubling the number of hospitals offering CA, these newly licensed facilities created competition for pre-existing "full-service" CA facilities, which were typically large inner city hospitals. Prior research demonstrated a reduction in the CA disparity in NJ, overall and relative to other states after the reform. This study examines the underlying market mechanisms that may have caused the disparity reduction.
Study Design: The outcome variable is the age-sex adjusted rate of CA use per 1,000 population for white residents minus the corresponding rate for black residents at the zip code level from 1993-2003. To link the policy change to the outcome measure, a "hospital choice set" was derived by determining the hospitals used most frequently by residents of each zip code. For each hospital choice set, the following variables were calculated: the Hirschman-Herfindahl Index for CA procedures, the number of full-service facilities, the number of low-risk facilities, and the share of CA procedures provided by each type of facility. Fixed effects models were estimated to determine how the characteristics of hospitals in the choice set relate to the CA use disparity before and after the reform.
Population Studied: Black and white CA users in NJ as identified in hospital billing records.
Principle Findings: New CA facilities were typically located in wealthier suburban areas with relatively few underserved populations. As a result, areas with access to new capacity experienced an increase in CA disparities. Before the reform, areas with relatively large numbers of full-service facilities in their choice set experienced CA disparities that were the same as or greater than other areas. After reform, these areas experienced reductions in the level of disparity. These findings are robust to alternative model specifications.
Conclusions: Despite the creation of mandated plans to improve access to the underserved, new entrants into the CA market did not serve greater numbers of black patients. However, by creating new competition for typically white suburban patients, these entrants may have induced incumbent facilities to provide a greater volume of service to nearby underserved populations.
Implications for Policy, Practice or Delivery: CON is sometimes viewed as a mechanism to protect profitable service lines used to subsidize care provided by safety net hospitals. This study finds that the opposite may have occurred before NJ's CON reform as incumbent hospitals may have used their local monopoly power to limit services to patients seen as likely to lack well-paying insurance coverage. The expansion of services to the previously underserved is clearly a positive outcome. But in light of renewed concerns about a medical arms race, the expansion of capacity and total volume of service raises questions about the cost-effectiveness of the reform.
Funding Source: AHRQ

Health Information Technology

Use of HIT in Different Settings of Care

Chair: Jesse Crosson, Ph.D.

Monday, June 4 • 4:30 p.m.-6:00 p.m.

- **Facility Characteristics Associated with the Use of Electronic Information Systems for Medical Care: Evidence from the 2004 National Nursing Home Survey**

Sophia Chan, Ph.D.

Presented By: Sophia Chan, Ph.D., Bloomberg School of Public Health, Johns Hopkins University, 11235 Oak Leaf Drive, Apt. 1208, Silver Spring, MD 20901, Phone: (301) 681-1639,

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Research Objective: Little is known about facility-level factors associated with the use of electronic information systems (EIS) for clinical decision support in nursing homes (NHs). The purpose of this study is to fill this gap.
Study Design: Facility-level data from the 2004 National Nursing Home Survey are used. The five dependent variables include whether an NH uses EIS for drug dispensing, medication administration, physician orders, lab orders / procedures, and patient medical records. The independent variables include occupancy rates, number of services, geographical region, accreditation status, ownership, metropolitan statistical area status, administrator's tenure and highest degree, percentage of residents with various types of primary source of payment. Multivariate logistic regression is used to model the likelihood of using EIS for each of the five tasks. The hypotheses are that 1) occupancy rate and 2) number of services are positively associated with use of EIS.
Population Studied: Licensed nursing homes in the U.S.
Principle Findings: NHs that offer more services are more likely to use EIS for drug dispensing, medication administration, physician orders, lab orders / procedures, and patient medical records. Thus the first hypothesis is supported. Compared to NHs with less than 70 percent occupancy rate, those with an 80 to 90 percent or at least a 95 percent occupancy rate are more likely to use EIS for physician orders, but not for other tasks. Thus the second hypothesis is partly supported. NHs in the West are more likely than those in the South to use EIS for drug dispensing, physician orders, medication administration, and patient medical records. NHs in the Northeast are less likely than those in the South to use EIS for these tasks. NHs with an administrator who has at least 20 years of experience as administrator are more likely than those with five to nine years of experience to use EIS for drug dispensing, physician orders, and lab orders / procedures. NHs with an administrator who has an advanced degree are more likely than those with only a high school diploma to use EIS for lab orders / procedures. NHs in metro areas are less likely than those in rural areas to use EIS for physician orders, medication administration, and patient medical records. An accredited SNF is more likely to use EIS for lab orders / procedures.
Conclusions: The use of EIS for clinical decision support in NHs is influenced by multiple factors. However, geographical location and financial characteristics (e.g. being able to afford an experienced administrator, being able to offer more services) seem to have consistent effects on EIS adoption.
Implications for Policy, Practice or Delivery: This study identifies factors that impact EIS adoption for specific clinical decision support tasks in NHs. In its efforts to promote full-scale EIS adoption, the government should examine market factors that inhibit NHs in the Northeast or metro areas to adopt EIS, educate administrators with shorter tenure about the benefits of EIS, provide incentives to NHs with a lower occupancy rate, and provide guidelines to improve care coordination and return on investment.

- Organizational Challenges of New Technology: Implementation of Electronic Health Record Systems in Safety Net Clinics

Oliver Droppers, M.S.A., M.P.H., Dr. Sherril Gelmon, Dr.P.H., Dr. Siobhan Maty, Ph.D., M.P.H ., Vickie Gates

Presented By: Oliver Droppers, M.S.A., M.P.H., Graduate Research Assistant, Department of Public Administration, Portland State University, PO Box 751, Portland, OR 97207, Phone: (503) 241-6492, Email: odropper@pdx.edu

Research Objective: Limited research has been reported describing the organizational challenges, impact and outcomes of the implementation of health information technology (HIT) within the health care safety net. The objective of this study was to articulate a list of key factors, challenges and promising practices for successful HIT implementation, with specific focus on electronic health record systems, in community health centers (CHC).
Study Design: The first year of this multi-year evaluation study employed a community-responsive collaborative research strategy, using a multi-method approach consisting of direct observations, focus groups, in-depth interviews, and surveys conducted from December 2005 through December 2006. An evaluation conceptual matrix of key concepts and indicators guided the research, helping to illustrate factors that either influence or hinder successful HIT implementation.
Population Studied: The population consisted of two federally qualified community-based health centers operated by a county health department in the metropolitan area of Portland, Oregon that serve medically un-insured and

underserved populations by providing access to comprehensive primary care and preventive health services. Each health center employs 40-50 full-time staff members including office assistants, interpreters, nursing and allied health personnel, laboratory technicians, pharmacists and pharmacy technicians, social workers, licensed independent practitioners and physicians.
Principle Findings: The findings indicate a number of key organizational factors that contribute to the successful adoption of the EHR, including strong organizational infrastructure, committed leadership and existence of a clear implementation plan, intense training of staff prior to, during, and after implementation, and access to readily available HIT technical experts and support personnel. Challenges identified include redesign of organizational workflow, impact on staff and providers, changes in provider-patient interaction, and the need for continuous modification of the EHR to respond to specific needs and patient population at each CHC.
Conclusions: To date, the two health centers have experienced a high level of success with adoption and implementation of the EHR. The organizational capacity for effective change management is critical to the success of any HIT system. It is clear that there is a significant learning curve associated with the initial and ongoing use of the EHR. Having sufficient organizational capacity and ability to respond and adapt rapidly to barriers and changes as they are encountered is vital for the initial and sustained operations in community health centers.
Implications for Policy, Practice or Delivery: The use of HIT can potentially improve the overall quality of patient care provided by a CHC as well as enhanced organizational functions, through increased ease in accessibility of patients' medical records, improved legibility, reduction in errors, improved processes for patient follow-up, tracking events, patient referrals, ordering and accessibility of lab results, and enhancement of patient satisfaction. Further understanding of the key organizational factors identified in this study can be used by similar organizations when planning to adopt an EHR or similar HIT system within the safety net context.
Funding Source: Kaiser Permanente Community Benefit Fund

- Provider and Patient Opinions on Technology Assisted Patient Reported Outcomes

Tami Mark, Ph.D., M.B.A., Barry Fornter, Ph.D., Gina Johnson, M.S.N., A.P.R.N.

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Research Objective: The Patient Assessment, Care & Education (PACE) SystemTM was designed to address the persistent problem of under-identification and treatment of chemotherapy-related symptoms. The PACE SystemTM uses a pen-based e/Tablet that operates off a wireless network. Cancer Support NetworkTM (CSN) on the e/Tablet provides educational materials to patients in text, video, audio, and graphic format. The PACE System™ also administers the Patient Care MonitorTM(PCM), a psychometrically validated, patient-reported symptom severity screening scale that generates a real-time, point-of-care report for the provider.
The aim of the study was to evaluate The PACE System™ – an electronic patient symptom screening and reporting system for oncology. Specifically, the study determined provider and patient opinions of The PACE System™ and documented evidence as to whether symptom assessment rates increased after The PACE System™ was implemented.
Study Design:
Ninety-two providers (i.e., physicians, nurse practitioners, physician assistants) at 16 community oncology clinics were surveyed about their experiences with The PACE System™. In addition, 100 patients at two community oncology clinics were surveyed about their perceptions of The PACE System™. Finally, at two oncology clinics 100 patient charts were abstracted in the year prior to implementation of The PACE System™ and 100 patient charts were abstracted in the year after the implementation The PACE System™ to determine symptom assessment rates.
Population Studied: Patients treated in community oncology centers.
Principle Findings: The majority of patients reported that they were generally satisfied with the PCM (55%). Slightly more than half indicated that it helped them to remember symptoms (53%) and 44% said it encouraged them to discuss their symptoms with their

provider. 91% of respondents said the e/Tablet was easy to use and the vast majority (90%) also said it was easy to read. 79% of patients would recommend The PACE System™ to other patients. Providers seemed to value the PCM Report. The majority of providers thought that the PCM increased the frequency with which symptoms were identified and treated. Almost 60% indicated that the PCM helped a lot with allowing for aggressive treatment of symptoms, and almost 50% reported that the PCM helped them to aggressively treat under-reported symptoms. The results from the chart review at two sites show statistically significant increases in the assessment rates for depression, pain, and fatigue after The PACE System™ was implemented. Prior to implementation of The PACE System only 9% of patients were assessed for depression, as compared to 73% after implementation. Assessment of fatigue increased by 29 percentage points, from 63% of patients to 92%. Assessment of pain increased by 21 percentage points, from 76% of patients to 97%. Examining each site separately revealed that at Site A saw an increased in screening rates for all three symptoms. At Site B screening rates for depression increased substantially, but there was a slight decline in screening rates for fatigue and pain.

Conclusions: The PACE System™ appears to be a promising approach to addressing the widespread problem of under-identification and treatment under-treatment of symptoms in patients undergoing cancer treatment.

Implications for Policy, Practice or Delivery: Payers may want to encourage the adoption of IT screening technologies in oncology clinics as a way to improve the quality of care being provided.

Funding Source: RWJF

- Features of Electronic Medical Records Used in Ambulatory Care Settings in 2005

Esther Hing, M.P.H., Catharine W. Burt, Ed.D.

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Research Objective: Although there has been progress in electronic medical record (EMR) adoption among ambulatory care providers, less is known about the functionalities of EMR systems in use. This paper examines both use of EMRs among office-based physicians and in hospital emergency and outpatient departments in 2005, as well as features included in these EMRs including patient demographic information, physician and nurse notes, lab test results, computerized test order entry, computerized prescription order entry, clinical reminders for screening test and guideline-based interventions, and public health reporting. We also examine use of fully functioning EMRs as defined by four minimally required functions (lab test results, computerized test order entry, computerized prescription order entry, and physician notes).

Study Design: The National Ambulatory Medical Care Survey is a nationally representative cross-sectional sample survey of non-federal office-based physicians providing patient care, excluding anesthesiologist, radiologists, and pathologists. The National Hospital Ambulatory Medical Care Survey is a nationally representative cross-sectional sample of emergency and outpatient departments in non-federal short-stay hospitals. Hospital, physician, and physician practice characteristics associated with EMR use were analyzed using Chi-square tests and logistic regression models.

Population Studied: Office-based physicians (n=1281), hospital emergency departments (n=345) and outpatient departments (n=213).

Principle Findings: In 2005, use of any type of EMR (fully electronic or part paper, part electronic) was highest in hospital emergency departments (ED), at 44 percent, followed by 33 percent of hospital outpatient departments (OPD) and 24 percent of office-based physicians. In 2005, features most frequently included in EMRs used in EDs and OPDs were lab test results, patient demographics, and computerized test order entry; among EMRs used by physicians, patient demographics, physician notes, and lab test results were most frequent. Smaller percentages of ambulatory care providers (9 percent of physicians, 12 percent of EDs, and 14 percent of OPDs) used EMRs with the minimal requirements of a functional EMR system. Among physicians, use of functional EMRs was lower among practices with 20% or more revenue from Medicaid. Controlling for physician and hospital characteristics, use of fully functioning EMRs increased with size of physician practice and with hospital bed size and varied by geographic region.

Conclusions: In 2005, most of the EMR systems used by ambulatory care providers did not

include the minimum functional requirements of a comprehensive system.

Implications for Policy, Practice or Delivery: EMR products in use varied among ambulatory care settings. The certification of EMR systems by the Office of National Coordinator for Health Information Technology, starting in July of 2006, may lead to more standardized EMR systems on the market. The increasing use of comprehensive EMR systems with size of physician practice and with hospital size suggests cost is a barrier to small physician practices and small hospitals in acquiring EMR systems. The variation in use of comprehensive EMR systems by hospital OPDs by geographic region may reflect effects of initiatives supporting EMR adoption at the state and local level.

Funding Source: CDC

▪ Clinical Information Technology Varies Across Subspecialties

Catherine Corey, M.S.P.H., Joy Grossman, Ph.D.

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Research Objective: To investigate the variation in use of clinical information technology (IT) by physician subspecialties.

Study Design: A cross sectional analysis of the 2004-05 Community Tracking Study (CTS) Physician Survey. Physicians were asked, "In your practice, are computers or other forms of information technology used to: (1) obtain information on recommended guidelines, (2) access patient notes or medication lists (3) write prescriptions, (4) exchange clinical data and images with other physicians, (5) exchange clinical data and images with other hospitals." Physicians reporting all five clinical activities formed a surrogate for access to an electronic medical record (EMR).

We tested for statistical differences in the proportion of physicians reporting IT use for each clinical activity by specialty (primary care, medical, surgical). Subsequently, we stratified by specialty type to investigate variation in IT by 12 subspecialties. Logistic regression models assessed whether observed differences in the likelihood of IT use persisted after controlling for physician, practice and geographic characteristics.

Population Studied: The 2004-05 CTS Physician Survey is a nationally representative telephone survey of 6,628 U.S. physicians involved in direct patient care, with a 52% response rate. To our knowledge it is the only data source with sufficient sample size to investigate subspecialty variation in IT use.

Principle Findings: Use of clinical IT varied and was consistently lower for surgical specialists. Fifty-seven percent used IT to obtain treatment guidelines, compared to 69% of medical specialists and 66% of primary care physicians (PCPs). Surgical specialists (17%) were also less likely to write prescriptions electronically than medical specialists (23%) or PCPs (25%). Access to patient notes and exchange of clinical data with other physicians were lower among surgical specialists and PCPs compared to medical specialists. The variation in use of clinical IT among subspecialties exceeded the variation between specialties. For example, psychiatrists were less likely than other medical subspecialties (referent) to obtain treatment guidelines (52% vs. 73%), access patient notes (36% vs. 55%), and exchange data with physicians (34% vs. 58%) or hospitals (34% vs. 70%). Ophthalmologists were less likely than other surgical specialists (referent) to access patient notes (23% vs. 56%), write prescriptions (9% vs. 17%), and exchange data with physicians (43% vs. 62%) or hospitals (45% vs. 73%). EMR access was less likely among psychiatrists and ophthalmologists. Emergency medicine physicians, oncologists and obstetricians/gynecologists were more likely to use IT for certain activities. Significant differences persisted among subspecialties, controlling for practice type, revenue from Medicaid, physician income and geographic location.

Conclusions: Patterns in IT adoption are primarily attributed to practice types/settings, perhaps reflecting differential levels of financial resources. Our findings suggest that practice specialty can also be a barrier to uptake. For example, certain IT products may not adequately meet specialists' clinical needs, or support differences in specialist workflow. In the case of psychiatrists, existing IT may not protect the sensitivity of patient-physician relationships.

Implications for Policy, Practice or Delivery: Since the specialties with lowest adoption are also more likely to work in small practices, efforts to expand IT should focus not only on financial incentives, but also on developing tools that can be tailored to specialists' needs.

Funding Source: RWJF

Real-Life Experience & Outcomes of Using Health IT Systems

Chair: Carol Cain, Ph.D.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

- **Systematic Use of Health Information Technology: Are We There Yet?**

Ilana Graetz, B.A., Mary Reed, Dr.Ph., Richard Brand, Ph.D., Tom Rundall, Ph.D., Jim Bellows, Ph.D., John Hsu, M.D., M.B.A., M.S.C.E.

Presented By: Ilana Graetz, B.A., Senior Research Assistant, Division of Research, Kaiser Permanente, 2000 Broadway, Oakland, CA 94612, Phone: (510)891-3174, Fax: (510)891-2856, Email: ilana.p.graetz@kp.org

Research Objective: Health information technology (HIT) offers great promise for improving health care if clinicians routinely and systematically use the HIT tools and the resulting information. We examined clinician use of electronic charting and computer prescription order entry (CPOE) tools during patient visits.
Study Design: In a 2005 self-administered questionnaire, clinicians reported the percentage of patient encounters for which they used CPOE, or recorded electronic visit notes using free-text or standard note templates. Respondents also rated the adequacy of training they received for each application and the overall level of HIT integration into their clinical workflow. We examined three types of clinician HIT use: any, routine, and systematic. We defined routine use as use of a HIT tool in over 80% of overall patient visits, and defined systematic use as routine use of both CPOE and electronic charting tools. Using multivariate logistic regression models, we examined individual clinician and organizational characteristics associated with systematic HIT use.
Population Studied: Adult primary care providers (PCPs) working in a large prepaid integrated delivery system (IDS). There were 581 respondents (49% response rate): 55% were female; mean age was 46 years (range: 30-75 years); 84% were physicians; 40% had over ten years tenure in the IDS; and 59% worked over 40 hours/week. All PCPs had access and training to the HIT tools starting in March 2004.
Principle Findings: Overall, 84% of respondents reported any use of electronic charting tools (81% free-text and 60% templates); 99% reported any use of CPOE. For recording visit notes, 40% of all respondents reported routine use of free-text note-taking; 20% routine use of templates; and 16% reported routine use of both templates and free-text. For order entry, 84% reported routine use of CPOE during their patient visits. Overall, 39% of respondents reported systematic use of both HIT charting and ordering tools. Among all respondents, 31% reported that training was adequate for the electronic charting tool; and 74% for the CPOE tool. Additionally, 48% reported that their team had incorporated HIT into their clinical workflow. In adjusted analyses, factors associated with systematic use included adequacy of training (OR=2.79 95%CI= 1.87-4.16) and incorporation of HIT tools into clinical workflow (OR=1.72, 95%CI: 1.20-2.48).
Conclusions: Nearly all clinicians reported some use of HIT tools once the tools are available and after receiving training; however, less than half of clinicians systematically used both charting and ordering tools when seeing patients. Only one in five clinicians routinely used advanced functions such as charting templates. Several factors, such as adequacy of training and incorporation of HIT tools into work flow, were significantly associated with systematic use of both charting and CPOE tools.
Implications for Policy, Practice or Delivery: While HIT could help improve health care and many primary care providers have started using the tools, most do not appear to use these tools routinely or systematically when seeing patients. Special attention to training and improving workflow could encourage more regular use of HIT.
Funding Source: AHRQ

- **Diabetes Care is No Better in Clinics that Use Electronic Medial Records**

Patrick O'Connor, M.D., M.P.H., A. Lauren Crain, Ph.D., Leif I. Solberg, M.D., Stephen E. Asche, M.A., William A. Rush, Ph.D., Robin R. Whitebird, Ph.D., M.S.W.

Presented By: Patrick O'Connor, M.D., M.P.H., Senior Clinical Investigator, Research, HealthPartners Research Foundation, PO Box 1524, MS 21111R, Minneapolis, MN 55440-1524, Phone: (952) 967-5034, Fax: (952) 967-5022, Email: patrick.j.oconnor@healthpartners.com

Research Objective: Many medical groups have made major financial investments to implement and maintain Electronic Medical Records (EMR). EMRs provide unarguable benefits in administration and billing functions, but their impact on outpatient quality of care is less well

understood. We conducted this observational study to assess whether clinics that use EMRs provide better quality diabetes care than clinics that do not use EMRs.
Study Design: We surveyed clinic managers and clinic physician leaders to determine which clinics used EMRs, and had sufficient data for analysis from 1566 patients in 60 clinics. We then compared levels of glycated hemoglobin (A1c), systolic blood pressure (SBP) and low-density lipoprotein (LDL) in the 455 diabetes patients receiving care at EMR clinics versus the 1111 diabetes patients receiving care at non-EMR clinics and with sufficient data for analysis. Bivariate analysis examined a single year's outcomes using independent samples t-tests. Multivariate analysis utilized general linear mixed models via MLWin software to compare three consecutive years of outcomes, accounting for the nested data and controlling for patient age, sex, education, duration of diabetes, heart disease status, physician specialty, body mass index, and Charlson comorbidity score.
Population Studied: Project QUEST was designed to assess the impact of a variety of organizational factors on quality of care at 19 medical groups with 84 participating clinics, and 2,117 randomly sampled adults with diabetes.
Principle Findings: In bivariate analysis, EMR use by clinics was not associated with better A1c (7.2% at EMR clinics vs. 7.3% at non-EMR clinics, p=.40), LDL (98.2 mg/dl vs. 102.4 mg/dl, p=.12), or systolic BP (133.1 mm Hg vs. 131.0 mm Hg, p=.06) in diabetes patients receiving care at those clinics. Multivariate models adjusting for patient and provider characteristics and clustering of multiple outcomes within patients and patients within clinics confirmed no significant differences in levels of A1c (p=.56), SBP (p=.15), or LDL (p=.95) when comparing patients receiving care at EMR versus non-EMR clinics.
Conclusions: Within a community that is experiencing ongoing sustained improvement in diabetes care, EMR use was not associated with better diabetes care. In both bivariate and multivariate analysis, patients at clinics that used EMRs had no better diabetes care than those at clinics without EMRs.
Implications for Policy, Practice or Delivery: These results suggest that the very large investment many medical groups and health plans have made in outpatient EMRs have not yet yielded expected gains in quality of diabetes care. More research is urgently needed to identify specific EMR applications and associated office workflows that may lead to better diabetes care.
Funding Source: HealthPartners Research Foundation

▪ Hospital EMR Use and Performance

Abby Kazley, Ph.D., Yasar Ozcan, Ph.D.

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Research Objective: Health care organizations in the United States have recently been pressured to adopt health information technology (HIT). This pressure is the result of speculation that tools such as electronic medical records (EMRs) will improve health care processes and outcomes by making care more automated, standardized, appropriate, and efficient. While some of these predictions are supported with qualitative and case study research, little quantitative research has been done examining the impact of HIT on hospital performance. The purpose of this study is to examine the relationship between hospital EMR use and performance. Specifically, this study attempts to measure the impact of EMR use on hospital quality and efficiency using Donabedian's structure, process, outcome framework.
Study Design: Using data from the AHA, CMS, HQA and HIMSS, this study uses a retrospective cross-sectional format with a non-equivalent control group. Observation takes place in 2004. Hospital quality is measured using data from the Hospital Quality Alliance. These data include information about clinician adherence to guidelines for patients with three conditions including pneumonia, acute myocardial infarction and congestive heart failure. These data were coded to produce a hospital quality score by providing a dichotomous measure of whether the hospital performed above or below the national average for each measure and then dividing this score by the number of measures the hospital reported. Hospital efficiency is measured using Data Envelopment Analysis (DEA). A CRS, input-oriented model is used. Hospital inputs include beds set up and staff, FTE staff, capital assets, and non-labor expenses. Outputs include case-mix adjusted admissions and outpatient visits. Once the hospital quality and efficiency scores are calculated, they are

dichotomized to identify the top performers in quality and efficiency. High quality performers were identified as those with a score of at or above the national mean as determined by the scoring system described earlier. High efficiency performers were identified as those with DEA scores at or above the 75th percentile nationally. The efficiency and quality scores were added together to identify hospitals that are high performers, mediocre performers, or low performers. A bivariate probit analysis is conducted to test the relationship between hospital EMR use and performance. Control variables include ownership, teaching status, size, case mix, and system affiliation.
Population Studied: The sample includes all non-federal acute care general hospitals that reported quality scores in 2004 (n=2891).
Principle Findings: Overall, the model is significant (log likelihood= -3612.94). A statistically significant relationship exists between EMR use and quality ($p<.05$), but no statistical significance is revealed between EMR use and efficiency. Case mix index is the only significant predictor of efficiency ($p<.0001$), but quality is significantly related to EMR use, ownership, teaching status, and case mix.
Conclusions: EMR use does not necessarily influence hospital efficiency, but it is related to quality. This analysis allows for the examination of hospital efficiency and quality while relating them to one another.
Implications for Policy, Practice or Delivery: Hospital administrators and policymakers may wish to consider that EMR use is associated with greater quality performance, however, it will not necessarily improve efficiency. It may be that efficiency gains will not be realized until an interoperable system exists, or it may take more time for hospital staff and policy to adjust to the EMR system.

- Variation in the Implementation & Use of e-Prescribing in Ambulatory Settings

Jesse Crosson, Ph.D., Douglas S. Bell, M.D., Ph.D., Nicole Isaacson, Ph.D., M.S.S., Debra Lancaster, MLIR, Joshua L. Newman, M.D., Emily A. McDonald & Tony Schueth

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Research Objective: To describe variations in the implementation and use of electronic prescribing in ambulatory settings and their potential clinical effects.
Study Design: Comparative case study of 12 ambulatory medical practices purposively sampled to ensure a mix of practice size and physician specialty from participants in an e-prescribing program sponsored by a New Jersey health plan. Field researchers used a template to guide collection of observational data relating to practice physical environment, organizational culture, and prescription-related clinical workflow before and after implementation of e-prescribing. Field researchers conducted 70 interviews with physicians and other practice staff members focusing on baseline expectations and subsequent usage patterns. A diverse team of investigators coded and then analyzed qualitative data using a template organizing style to identify common themes.
Population Studied: Ambulatory physician practices participating in an e-prescribing program.
Principle Findings: Practices included family medicine, general internal medicine, pediatrics and obstetrics/gynecology ranging in size from 1 to 6 physicians. Eight practices successfully installed an e-prescribing program but the extent and methods of use varied substantially. Varying numbers of prescribers in each practice used e-prescribing and two practices relied exclusively on support staff rather than prescribers to submit e-prescriptions. Two practices installed but then discontinued use and two more failed to install the program. Uses of formulary information varied widely with some users reporting regular usage of these feature and fewer calls from pharmacies relating to coverage while others found the information incomplete, unreliable, or were unsure how to access it. Gaps in medication history data, and the use of non-clinically trained support staff to submit e-prescriptions, made use of clinical decision support features relating to potential medication interactions and allergies difficult for some participants. Clinicians in several practices exhibited incomplete knowledge of appropriate use of e-prescribing. At the same time, several practices reported a reduction in calls from pharmacists for clarification of handwriting and to address dosage errors. One system may have introduced a potential hazard by making it easier to prescribe a medication erroneously to one patient while attempting to prescribe for another patient.

Conclusions: As expected, in several practices, e-prescribing programs improved the efficiency and safety of prescription-related workflow. These improvements in safety and efficiency may offer practices the opportunity to focus limited resources on further improving clinical care. However, complex adaptive processes at the practice level led to wide variation in usage patterns and a number of unexpected effects that may limit expected quality and safety improvements. Implementation of e-prescribing systems should take into account the complex nature of ambulatory care environments and target training efforts to ensure that this technology is used in ways that ensure the achievement of expected quality and safety improvements.

Implications for Policy, Practice or Delivery: Achieving the safety and quality improvements offered by e-prescribing technology will require greater attention to potential variation in use. Policy makers' efforts to encourage the use of this technology should include guidance on appropriate use and on the technical and training support needed to fully achieve the safety and quality gains offered by this technology.

Funding Source: CMS, AHRQ

- **The Demise of the Santa Barbara Care Data Exchange: Lessons for Policy**

Robert Miller, Ph.D., Bradley S. Miller, M.D., M.B.A.

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Research Objective: Health information exchange (HIE) through regional health information organizations (RHIOs) is seen by many as essential for improving quality of care. The Santa Barbara Care Data Exchange (SBCDE) demonstration was once one of the most ambitious and publicized HIE efforts in the U.S. Yet eight years after its development began, the SBCDE shut down, having failed to provide data to clinical end-users. Our objective was to review the SBCDE history, compare the SBCDE experience to two functioning RHIOs, and outline lessons learned for emerging RHIOs.

Study Design: In this retrospective, qualitative study, we conducted over 40 recorded interviews of managers, and used pattern-matching and explanation-building techniques to identify themes emerging from the data.

Population Studied: Current/former managers in key participating organizations in the SBCDE (community organizations, the California HealthCare Foundation (the main funding agency), and CareScience (the project manager and software vendor), as well as key leaders in two of the handful of currently functioning RHIOs (in the Indianapolis and Spokane areas).

Principle Findings: From fall 1999 through fall 2005, software development delays slowed SBCDE progress. From fall 2005 to end 2006, disputes over liability risk assumption and payment for RHIO services among community participants eventually ended the SBCDE. We found several proximate causes for the SBCDE failure, including: 1) the behavior distorting effect of foundation funding of the demonstration—in particular, both community organizations and the project manager/software vendor (CareScience) reduced their efforts once foundation subsidies ended; 2) the lack of community leadership of the effort, fostered by CHCF largesse and CareScience expertise; 3) limitations of the project manager/software vendor, which underestimated software development challenges in an area where it had little substantive expertise; and 4) lack of a compelling value proposition to community participants, in part due to the simplicity of the market which reduced the need for HIE.

In reviewing the experience of two functioning RHIOs, we found that once economies of network size (number of participants) and scale have been reaped, and individual HIE services have been piloted, RHIOs can gain sizable economies of scope—i.e., additional HIE services can be added at low enough marginal cost to be profitable.

Conclusions: Although other RHIOs can avoid the SBCDE software development delays by using HIE software already vetted elsewhere, adapting existing HIE software, as well as achieving/revising comprehensive business agreements among community organizations, will take much time and slow RHIO efforts for years to come. Local factors--including market size and complexity--can have a profound effect on the value proposition to community participants of HIE and RHIOs.

Even with fewer technology delays and more community leadership, other RHIOs may also stumble over HIE service value propositions without a combination of mandates, grants, and incentives that pay for initial RHIO infrastructure and services development, and that ensure

provision of unprofitable services valuable to patients and the community.
Implications for Policy, Practice or Delivery: Further expanding RHIO grant funding for research and development to more communities with strong leadership commitment and RHIO momentum is essential to inform private/public policy-maker decisions about the effect of many local factors on the value propositions of specific RHIO services and their diffusion rates. Moreover, while health care grants and incentives can increase the pace of RHIO development, the Santa Barbara experience suggests that federal or state mandates may eventually be necessary in some communities.
Funding Source: California HealthCare Foundation

Implementation of Research

Implementation of Research

Chair: Jacqueline Pugh, M.D.

Tuesday, June 5 • 10:45 a.m.-12:15 p.m.

▪ Development and Testing of an Adoption Decision Guide for Patient-Centered and Efficiency Innovations in Health Care

Nancy Lenfestey, M.H.A., Amy Roussel, Ph.D., Jacqueline Amoozegar, B.A., Asta Sorensen, M.A., Cindy Brach, M.P.P.

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Research Objective: The purpose of this project is to develop and test a decision guide for adoption of innovations in health care. Innovations in care delivery are often complex, multi-faceted interventions that are not fully explicated, and thus present challenges for organizations in determining whether an intervention's components are adaptable in different organizational cultures. Guided by a framework that understands adoption as a process, rather than an event, we developed a multilayered adoption decision guide promoting evidence-based decision making to assist organizational decision makers in determining whether an innovation would be a good fit – or an appropriate stretch -- for their organization.

Study Design: Selection of preliminary domains for the adoption decision guide was based on: 1) information obtained from a series of semi-structured telephone interviews with leaders from up to six health care organizations that implemented efficiency-focused innovations, four with patient-centered care innovations, and five with innovations focused on both; and 2) an internet search and literature scan for relevant decision making tools, guidelines and other resources to assist leaders in their decision making processes. The interviews will be supplemented by case studies of 4-6 adopting organizations. QSR NVivo 7, a qualitative software analysis package, was used for inductive/deductive coding and analysis. Usability testing of the draft instrument is expected to occur in several diverse health care settings in May 2007, with a finalized adoption decision guide available in June 2007.
Population Studied: This study focuses on the adopting organization as the unit of analysis, rather than the individual adopter. The purposive sample of health care organizations was stratified by type of facility, population serviced, and characteristics of the adopted innovation including technological complexity, orientation towards people vs. technology, and degree of implementation complexity. We attempted to include a diversity of priority service populations and range of settings including health plans, hospitals, physician practices, and non-profit organizations.
Principle Findings: The decision guide includes the following dimensions: innovation description; goal identification and potential benefits; staff/patient/client readiness for change; appropriateness; decision-making; observability; replicability; level of resources needed; compatability/practicality; potential barriers/challenges; trialability; and sustainability. Assessing staff readiness for change, the innovation's alignment with the organization's mission, anticipated cultural changes, and the potential organizational impact of an innovation resonate as strong considerations in the adoption decision process. The decision guide highlights each dimension's importance and offers tools and techniques for self-appraisal as part of the process.
Conclusions: A multilayered adoption decision guide allows users to select the appropriate level of detail while also promoting evidence-based decision making. Such a tool provides health care organizations of all types with a framework for self-assessment in key financial, non-

financial, and strategic areas that should be considered before adopting an innovation.
Implications for Policy, Practice or Delivery: Innovations to improve health care continue to evolve. The use of a tool that helps decision makers understand resistance to change, the anticipated level of resources needed, and projected strategic and operational costs involved may be pivotal in helping organizations to optimize and operationalize improvements systemwide.
Funding Source: AHRQ

- Recruitment of Primary Care Clinics and Health Plans under HIPAA Regulations

Eileen Emori, M.B.A. Management and Marketing, Amira El-Bastawissi, M.B.Ch.B., Ph.D., Eric Ossiander, M.S., Biostatistics, Nguyet Tran, M.P.H., Doug Conrad, Ph.D.

Presented By: Eileen Emori, M.B.A. Management and Marketing, Research Coordinator, Department of Health, University of Washington & State of Washington, MS 47855, Olympia, WA 98504-7855, Phone: (360) 236-3842, Fax: (360) 236-3708, Email: eileen.emori@doh.wa.gov

Research Objective: To develop effective methods for recruiting clinics and health plans into a study to measure the Washington State Collaborative's impact on diabetes patient economic outcomes.
Study Design: We are recruiting 10 randomly selected WSC clinics and 10 randomly selected (non-WSC participant) control clinics. Non-WSC clinics are matched to WSC clinics on clinic size (number of primary care providers). Clinic data are being linked to health plan, hospital discharge, census, and death certificate data. Clinic recruitment is sequential: 1. Use the Internet to determine address, number of primary care providers and contact information. 2. Call to confirm contact and address of medical director or clinic administrator. 3. Send invitation letter from the state health officer to the contact. 4. Call contact and provide study executive summary . 5. Arrange a face-to-face meeting with contact. 6. Provide study materials: letter of support template, data use agreement, patient selection criteria and clinic questionnaire. 6. Use three additional follow-up calls and two additional letters to promote the clinic's participation. Health plan recruitment entailed meetings with chief executive officers, IRB committees, quality assurance/improvement directors, IT directors, and data personnel. HIPAA regulations required coordination with state health department quality assurance, data security, contracts, and legal staff. We created protocols, including data use agreements and data specifications, to meet HIPAA, state and federal privacy rules.
Population Studied: Diabetes patients receiving care in primary care clinics in Washington State.
Principle Findings: 1. WSC clinic participation rate is 62.5% (10 of 16 clinics) and non-WSC clinic participation rate is 20% (6 of 30 clinics contacted). Reasons for refusal include new electronic medical records systems being set up in clinics, clinic understaffing, clinic moving, clinic being too new to have patient data from beginning of study period, and specialty versus primary care clinic. 2. All 3 commercial health plans and 1 public employee plan have agreed to participate. 3. Costs to recruit: Average cost to recruit a clinic is $1,735 and average cost to recruit a health plan is $2,160. Total cost for recruitment of clinics is $34,700 and health plans is $8,640 including staff hours, travel and reimbursement to clinics and health plans to offset organization-specific data collection costs. Total recruitment cost to date is $43,340 over 6 months. 4. Security issues: We implemented special procedures to meet HIPAA protected health information (PHI) requirements. Meeting these requirements substantially delayed receipt of clinic data. We could not allow an outside contractor to analyze data off-site. We are creating "limited data sets" (as defined by HIPAA) as analytic files.
Conclusions: Recruiting clinics and health plans requires creative approaches to ensure data security at federal, state and organizational levels of review. Data retrieval differs for clinics and health plans, requiring tailored pre-planning, and differential circumstances across organizations demand flexible responses to staff turn-over, limited time and resources.
Implications for Policy, Practice or Delivery: Especially in complex, multi-level studies, researchers must craft flexible recruitment, data collection, and data protection procedures that reflect the diversity of organizations and environments under study. This project's findings suggest a rigorous design that meets those requirements and replicable by other researchers.
Funding Source: RWJF

▪ Trust Building among Minorities Through CBPR/Action Research: Experiences from the Lower Mississippi Delta

Ari Mwachofi, Ph.D, Everlyn Bryant, Raw-Crop Farmer

Presented By: Ari Mwachofi, Ph.D, Assistant Professor, Health Administration and Policy, OUHSC - College of Public Health, 801 NE 13th Street, Oklahoma City, OK 73104, Phone: (405) 271-2114, Fax: (405) 271-1868, Email: amwachof@ouhsc.edu

Research Objective: The research purpose was to gather service access and provision data for minority farmers and to recommend a service access/provision model that would improve minority farmers' access. After applying the traditional research approach and experiencing lack of trust, building trust became a major objective of the study.

Study Design: The project applied the traditional research approach with researcher hypotheses, methods, and survey instruments developed outside the focus community. Although the researchers were Black from a historically Black university, Black farmers did not trust the researchers and occasionally interviewers experienced open hostility. The traditional research approach was replaced by CBPR/Action Research. Farmers were included in re-planning the project. They were trained as interviewers and focus group facilitators. Their inclusion and participation was effective in building trust as indicated by a dramatic improvement in response rates and enthusiastic farmer participation in focus group.

Population Studied: Rural minorities in the lower Mississippi Delta states Arkansas, Louisiana and Mississippi.

Principle Findings: CBPR/Action Research: facilitated trust-building; enhanced social capital as indicated by the creation of a farmer-to-farmer support network; facilitated consumer-service provider dialogues; broadened the research focus and activities; and facilitated a seamless translation of research findings into practice as evidenced by changes in rehabilitation services eligibility criteria to include more farmers.

Conclusions: Rather than looking at minority health from the outside, research should include insider information by involving minority communities as powerful allies in research and in the fight to end health disparities. CBPR/Action Research is an effective tool in this focus shift.

Implications for Policy, Practice or Delivery: The new approach requires a shift from looking at what should be done to/for this population to what can be done in collaboration with this population. This approach has two major elements to this approach: i) Engagement rather than imposition which shifts from the old paradigm of creating solutions outside and imposing them on minority populations. This approach engages and includes minority populations in all critical phases to ensure that the created approach is born of the minority population's circumstances, it is homegrown, relevant and acceptable to this population. Engagement of the population becomes a catalyst to raising awareness and encouraging action by the population, so that the intervention creation is one with dissemination and application. It avoids creating feelings of imposition, oppression and resentment inherent in the old paradigm. This approach "roots live interventions" in this population such that they are dynamic amenable to changing with the conditions on the ground. It also captures the power of collaboration and teamwork, further catalyzing and strengthening positive changes. ii) New Researcher Attitudes and Perspectives which requires the awareness by academic researchers that they know less about the conditions and experiences of the research subjects than the subjects do. This is a difficult admission for researchers who were trained in the old paradigm and who have hypotheses that they want to prove/or disprove.

Funding Source: National Institute on Disability and Rehabilitation Research (NIDRR)

▪ Leveraging Front Line Expertise: A Safety Culture Intervention to Enhance Senior Managers' Engagement

Alyson Falwell, M.P.H., Sara Singer, M.B.A., Anita Tucker, D.B.A., Alyson Falwell, M.P.H., Jennifer Hayes, M.A.

Presented By: Alyson Falwell, M.P.H., Center for Health Policy/Primary Care and Outcomes Research, Stanford University, 117 Encina Commons, Stanford, CA 94305, Phone: (650) 724-0332, Fax: (650) 723-1919, Email: falwell@stanford.edu

Research Objective: To allocate resources and intervene to improve systems appropriately, senior managers must accurately perceive the hazards experienced at the front lines of healthcare delivery. Research, however, suggests that executives are consistently more optimistic

about their organizations' safety culture than frontline workers, and workers' perspectives are more accurate, i.e., they relate to safety performance while executives' perceptions do not. We developed, implemented, and evaluated an intervention—Leveraging Front Line Expertise (LFLE)—to engage hospital executive teams in frontline care through a systematic process that increased their availability in patient care work areas and facilitated identification, prioritization, resolution, and feedback about safety concerns. This project evaluates the ability of hospitals to implement LFLE and reports qualitatively on areas of success and quantitatively on characteristics of hospitals associated with high achievement.
Study Design: We conducted LFLE in 24 U.S hospitals for 18 months beginning in 2005. In 3-month cycles, senior managers completed the following activities in one hazardous work area per cycle: 1) worksite observation; 2) safety forums with frontline staff to identify and prioritize safety concerns; 3) debrief meetings to propose resolutions and assign responsibility; and 4) staff feedback. Hospitals documented number of observations and forums, safety concerns identified, resolutions recommended, and extent of implementation. Prior to the intervention, we rated hospitals' preparedness for and prioritization of the intervention based on interviews and collected data on staff perceptions of safety climate using the Patient Safety Climate in Healthcare Organizations survey.
Population Studied: Self-identified teams of senior managers (typically CEO, CMO, CNO, and Director of Quality/Patient Safety) in 24 hospitals, participating in a study to measure safety culture, and the frontline personnel and unit managers in nearly 200 work areas visited. Hospitals were selected using stratified random sampling techniques, and represent all 4 U.S. census regions and 3 size categories.
Principle Findings: All hospitals successfully implemented the intervention in at least one patient care area; 20 (83%) completed two or more cycles, observing in 200 units and conducting 50 forums. Over 1200 safety concerns—related most often to communication and documentation, equipment, infection control, and medication administration—were identified by executives and frontline staff. More than two-thirds of concerns identified were addressed by improvements ranging from increased staffing and staff development to procurement of goods or services and equipment maintenance. Completion of improvement cycles and identification and resolution of safety concerns were more associated with the priority senior managers granted to the intervention than with measures of hospital safety climate strength or intervention preparedness scores.
Conclusions: A systematic intervention to expose senior managers to the daily challenges faced by hospital staff helped frontline workers speak up in ways that enabled executives to hear and address their safety concerns. Executives rated the intervention as valuable, and most plan to continue using the methodology after the intervention period.
Implications for Policy, Practice or Delivery: Interventions that expose senior managers to care "at the sharp end" can improve communication about patient safety.
Funding Source: AHRQ

- **Facilitation in Implementing Evidence-Based Practices for Schizophrenia: Researcher and Clinical Leader Perspectives**

Jeffrey Smith, Ph.D. Candidate, John J. Spollen, M.D., Richard R. Owen, M.D.

Presented By: Jeffrey Smith, Ph.D. Candidate, Implementation Research Coordinator, Central Arkansas Veterans Healthcare System, VA Mental Health Quality Enhancement Research Initiative, 2200 Fort Roots Drive, Building 58 (152/NLR), North Little Rock, AR 72114, Phone: (501) 257-1066, Fax: (501) 257-1707, Email: Jeffrey.Smith6@va.gov

Research Objective: 'External facilitation' is a technique used by implementation researchers to work actively with clinical stakeholders to enable the uptake of evidence into practice. This abstract reports researcher and clinical leader perspectives on external facilitation activities and lessons learned in a Veterans Health Administration (VHA) Mental Health Quality Enhancement Research Initiative (MH QUERI) project to implement evidence-based antipsychotic medication management for patients with schizophrenia.
Study Design: Descriptive case study of external facilitation applied by researchers in partnership with VA medical center staff implementing a team-based quality improvement (QI) intervention, educational materials, and performance monitoring tools to improve antipsychotic medication management for patients with schizophrenia.
Population Studied: VA medical center mental health clinicians

Principle Findings: The external facilitator maintained regular contact with the QI team to monitor implementation of project tools/strategies, identify barriers, problem-solve, and assist in adapting tools/strategies as needed. Facilitation resulted in placement of recommendations for antipsychotic dosing and side effect monitoring on medication order screens, enhanced performance reports tailored to clinician preferences and specifications, and development of weekly provider-specific reports identifying patients in need of metabolic side effect monitoring. Side effect monitoring was considerably improved subsequent to implementing the weekly monitoring reports, moving the medical center from non-compliance to compliance with network-level performance measures for antipsychotic side effect monitoring. Weekly reports continue to be utilized and monitoring improvements have been sustained for one year after the research project concluded. From the researcher perspective, lessons learned include: (1) external facilitators need to be flexible to accommodate suggestions of clinical partners for modifying tools/strategies when initial efforts have limited success, (2) rapid response to clinical partner concerns is optimal but not always feasible due to time/availability issues; and (3) there is a need to establish boundaries for what facilitators will and will not do for clinical partners to minimize potential for misunderstandings. From the clinical leader perspective, external facilitation: (1) placed too much initial emphasis on promoting provider education strategies; and (2) encouraged innovation to emerge from within the clinical team by actively eliciting and responding to clinical staff feedback on needed refinements/augmentations to intervention tools.
Conclusions: External facilitation as an implementation strategy may foster collaborative relationships between researchers and clinical leaders that can successfully encourage the adoption and sustained use of evidence-based practices.
Implications for Policy, Practice or Delivery: The process of external facilitation may be a generalizable approach researchers can use to implement evidence-based care in routine clinical practice. New organizational structures or mechanisms may be needed to support such research-clinical partnerships.
Funding Source: VA

Innovations in International Health

Innovations in International Health

Chair: Martin Roland

Sunday, June 3 • 4:30 p.m. – 6:00 p.m.

▪ The Reform of China's Health Care System: Problems and Solution

John Cai, Ph.D.

Presented By: John Cai, Ph.D., Professor of Economics, Senior Health Policy Analyst, Fudan University (China), Massachusetts Division of Health Care Finance and Policy, 2 Boylston Street, Boston, MA 02116, Phone: 617-988-3137, Fax: 617-727-7662, Email: john.cai@state.ma.us

Research Objective: As the once government-subsidized health care system gradually dissolved, the traditional health care safety network has experienced profound transformation and leaves a tremendous vacuum unfilled by the current fragmented health care system. The heated debate is focusing on the choice between a market-oriented model versus a government-dominated model. What are the fundamental problems in China's current healthcare system and how to forge a sensible strategy to incorporate a reasonable government intervention and an effective market force? This study is aimed to address these questions and hope to shed light on China's future healthcare reform.
Study Design: With China's National Health Statistics data covering the period of economic reform during 1978-2004, we investigated the changes of China's health care system from two dimensions: 1) the structure of health care financing: the shares of total health care expenditures accounted by government, by non-governmental health insurance, and by personal out-of-pocket payment respectively; and 2) the structure of health care provision further divided into a) the shares of hospitals owned by government, by private not-for-profit organizations, and by private for-profit companies; and b) the sources of hospital funding from government versus market. We further separated the sources of hospital funding into labor and capital expenditures.
Principle Findings: The governmental share of total health care expenditures reduced from

32.2% in 1978 to 17% in 2004, while the share of personal out-of-pocket payment increased from 20.4% to 53.6%. Although three quarters of hospitals are still owned by the state and half of the hospitals are directly run by the government, only about 10% of hospital revenues come from government budget and the remaining 90% has to be generated from the market. The government funding used to cover entire hospital labor and capital costs, but now covers only one third of hospitals' labor costs and one fifth of capital costs. Without effective government regulation, strong financial incentives combined with integrated organizational structure of hospitals, physician, drug dispensing and lab tests led to the explosion of health care expenditures which put heavy financial burdens directly on individual patients. Therefore, half of the patients cannot afford to see doctors and about 30% of the patients cannot afford to stay in hospitals.
Conclusions: China's current health care system has been shifted to an extremely market-oriented model at least from its financial operation. The reform of China's health care system should take different strategies 1) for its financing structure: increasing funding from government and health insurance as well as reducing the share of patients' out-of-pocket payment; and 2) for its provision structure: increasing the role of private not-for-profit organizations, improving government regulation, and nourishing a healthy market competition.
Implications for Policy, Practice or Delivery: The reform of health care system should avoid simplistic and ideological swing from one extreme to another: government versus market. The experiences and lessons accumulated in many countries show that combining social fairness in financing with competitive efficiency in provision can lead to a more balanced health care system.

- Is Technology a Real Health Expenditure Driver? A Comparative Statistical Analysis of 19 Industrialized Countries.

Bart Verbelen, B.S., M.S., Ph.D.

Presented By: Bart Verbelen, B.S., M.S., Ph.D., Assistant Professor, IMPALLA Program, CEPS/INSTEAD, 44 Rue Emile Mark, Differdange, 4620, Luxembourg, Phone: +352 58 58 55 556, Email: bart.verbelen@ceps.lu

Research Objective: The first aim of this paper is to investigate the multi dimensional impact of technology on total health expenditures. The first technology dimension - measured by the density of MRIs - represents the availability of technology. The second dimension, related to the use of non-intrusive use of technology to cure or prevent certain diseases with the likelihood of avoiding future more costly interventions (also known as the substitution theory), is measured by pharmaceutical expenditures. The third dimension measures the actual use of high technology combined with its intensity through the number of kidney transplants per 100,000 inhabitants. The percent of population covered by statutory insurance, the share of population age 65 and older as well as the level of urbanization are controlled for as well as income and share of public financing.
Study Design: Pooled time series regression diagnostics indicate the absence of multicollinearity but the presence of heteroscedasticity and autocorrelation. Based on the Hausman test, a fixed effect model was chosen. The robustness of the model is tested through the use of imputed and unimputed data with and without the US.
Population Studied: OECD 2005 health data are used for the analysis comprising 19 industrialized countries from 1970 through 2000.
Principle Findings: With the exception of the age variable, the model is robust as all the estimates have the same sign and are of the same magnitude. As in all previous comparative analyses, per capita income is the most important explanatory variables. Public share of total health expenditures is significantly inversely related to total health expenditures whereas a higher level of urbanization is significantly related to higher health expenditures.
With respect to the variables measuring the different dimensions of technology, all of them are inversely related to the dependent variable (total per capita health expenditures). The availability of MRI's is never significant, while kidney transplants is significant at the =0.1 level in the unimputed sample and at the =.05 level in the imputed sample irrespective of whether the US in omitted or not. Pharmaceutical share of total health expenditures is highly significant and inversely related to the dependent variable. As far as the two other expenditure increasing variables are concerned neither percent of population with statutory health insurance nor the percent of population age 65 or older have a significant impact.
Conclusions: At an aggregate level of analysis, this study contradicts the long-time paradigm that technology is a major driver of total health

expenditures. Contrary to previous research, the results indicate that increased technology as measured by total share of health expenditures spent on pharmaceuticals has an expenditure lowering effect while the availability of high-tech procedures and their use have no significant impact on total health expenditures. In addition, the argument that insurance coverage as well as an ageing population would aggravate the increase in expenditures is countered by the results of this study. Taking into account the overall impact of technology, an increase in pharmaceutical expenditures with 10 percent, has the potential to decrease total health expenditures by about 3 percent and, similar ratios apply to the share of public financing of a health care system.

Implications for Policy, Practice or Delivery: The interpretation of these findings is complex as it overthrows conventional economic theories but its implications are profound. A health care system that appropriates an important role for government in financing health care and is open to the use of (cost-effective) technologies will have at the end of the day lower health expenditures.

▪ The Effects of Pay-for-Performance System on Tuberculosis Control and Treatment in Taiwan

Ya-Hsin Li, Master, Mahmud Khan, Ph.D., Wen-Chen Tsai, Dr.P.H.

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Research Objective: In order to make tuberculosis (TB) treatment more effective and to lower the transmission rate of the disease, the Bureau of National Health Insurance (BNHI) in Taiwan started the implementation of a pay-for-performance demonstration project for the treatment of TB in October of 2001. Later in January of 2004, the demonstration project was scaled-up as a national program. The program was officially named as "pay-for-performance on Tuberculosis" (P4P on TB). Although the P4P on TB is in existence in Taiwan for more than three years now, no systematic study has been conducted to examine the effects of the new system on outcomes. The purpose of this study is to investigate the effectiveness of the P4P system in terms of a number of desirable outcomes.

Study Design: This study focused on the effects of the P4P program on TB cure rate, rate of failure and length of treatment required for recovery. National database from Center for Disease Control of Taiwan has been used to compare the treatment outcomes before and after the implementation of P4P program. The treatment outcomes were compared between hospitals participating in P4P and hospitals not participating in P4P. Another interesting comparison would be to examine the effectiveness of treatment in hospitals with and without case managers for participating hospitals.T-tests were conducted to compare the differences of TB cure rate, failure rate, and length of treatment before and after the implementation of P4P program, between participating and non-participating hospitals, and between hospitals with and without case managers. ANOVA was used to examine the differences of TB cure rate, failure rate, and duration of treatment among four geographic areas, levels of hospitals and hospital ownership status.

Population Studied: The study population consists of all new TB cases found during the years 2001 to 2005 in Taiwan.Current statistics show that 12,299 new TB cases were detected in 2001, 15,923 in 2002, 14,374 in 2003, 16,767 in 2004, and 16,258 in 2005.

Principle Findings: For patients in the age group 25 to 50 years, the cure rate was 91% in 2003 and 92% in 2004. Compared to pre-P4P situation, cure rates show significant improvements. The rate of failure declined to 5.91% in 2003 and further decline occurred in 2004 (3.28%). When comparing the treatment outcomes between hospitals participating in P4P and hospitals not participating in P4P, the results of the demonstration project in Central Region Branch of BNHI indicate an improvement in cure rate for nine month treatment by about 26% in 2002 (83.8% cure rate for P4P participants and 57.6% for non-participants). The rate of failure was 23.7% for patients in P4P compared to 37.0 % for patients not in P4P. The average length of treatment for achieving full recovery was 224 days for patients in P4P compared to 296 days for non-P4P patients.

Conclusions: The pay-for-performance system for tuberculosis in Taiwan has increased the nine-month cure rate by 45% and lowered the average length of treatment by 24%. The P4P

system has improved health status and quality of life of TB patients in Taiwan.
Funding Source: National Science Council in Taiwan

- Responding to the Epidemic of Chronic Disease

Ellen Nolte, M.P.H., Ph.D., Martin McKee, M.D., M.Sc.

Presented By: Ellen Nolte, M.P.H., Ph.D., Senior Lecturer, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT, England, Phone: +442076127809, Email: ellen.nolte@lshtm.ac.uk

Research Objective: Many countries are experimenting with new models of care delivery involving enhanced integration and coordination of services to better meet the needs of those living with chronic illness. However, the available evidence on the relative value of different forms of integration remains uncertain. This study reviews approaches to chronic disease management in Europe, Canada and Australia and assesses the contextual, organisational, professional, funding and patient-related factors that enable or hinder implementation of strategies to address chronic illness.
Study Design: The study uses a structural framework that draws on the Chronic Care Model (CCM) developed by Ed Wagner and colleagues. It involves analyses at two levels: (1) a series of commissioned papers exploring key themes as identified from the CCM, synthesizing the evidence and drawing on the relevant published academic and grey literature; and (2) case studies in seven countries (Australia, Canada, England, France, Germany, Netherlands, Sweden) that examine in-depth approaches to chronic illness care in the respective health care setting, using a structured questionnaire.
Population Studied: Seven countries: Australia, Canada, UK (England), France, Germany, Netherlands, Sweden
Principle Findings: Approaches to chronic care not only vary between but also within countries, using e.g. formal disease-management programs (Germany; Netherlands), nurse-led clinics (Netherlands; Sweden), health networks (France; Ontario/Canada), care coordination (NSW/Australia), community matrons (England). The involvement of the non-medical profession differs considerably between countries with England, Sweden, and, to lesser extent, the Netherlands and Australia making extensive use of nurses but not France or Germany where there are legal and professional restrictions on the deployment of nurses outside hospital. Although the role of self-care is being acknowledged as a key component of effective chronic disease management, systems supporting self-care remain relatively weak in many settings. The sustainability of chronic care models faces considerable challenges in all health care settings. These include administrative and financial obstacles to enhance the coordination and/or integration of health and social/community care services; under/mis-investment in suitable information systems; conflicting policies (activity-based funding vs. shifting care into the community); focus on cost reduction; and the potential impact of electoral cycles.
Conclusions: An effective response to the emerging epidemic of chronic disease requires a health system environment that allows for the development and implementation of structured approaches to chronic disease management. Experience thus far suggests that particularly systems that are characterised by fragmentation of health services are facing considerable challenges towards the successful implementation of system-wide strategies to provide care for patients with chronic illness.
Implications for Policy, Practice or Delivery: The diversity of European health care systems means that there are no universal solutions to the challenges of chronic disease. What may be possible in one health care system may be impossible, at least in the short term, in another ostensibly similar system if the two differ in critical aspects. Each system must find its own solution, although it can also draw on the lessons learned by others. It may also conclude that the necessary changes are not possible in the existing system and instead require fundamental reform.
Funding Source: National Co-ordinating Centre for Research Capacity Development; European Observatory on Health Systems and Policies

- Implementing Pay-for-Performance: What Changed when Incentives Changed in Primary Medical Care in the United Kingdom?

Bruce Guthrie, M.B., Bchir, M.R.C.G.P., Ph.D., Suzanne Grant, Ph.D., Kath Checkland, M.B.B.S., Ph.D., Ruth McDonald, Ph.D., Huw Davies, Ph.D., Guro Huby, Ph.D.

Presented By: Bruce Guthrie, M.B., Bchir, M.R.C.G.P., Ph.D., Harkness Fellow in

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Research Objective: Since 2004, approximately 20% of UK General Practice income has depended on performance measured by 147 quality indicators in the Quality and Outcomes Framework - QOF. In 2005/6, median achievement on the composite quality score was 1034, 98.5% of the possible maximum 1050 points, prompting debate about whether QOF had changed care, or was simply paying for existing work. This study examined in detail the impact of QOF on organization of chronic disease care in four practices.
Study Design: In-depth, qualitative examination of practice organization. Data collection in 2005/6 included non-participant observation of staff at work over 7 months, informal interview during observation, and semi-structured formal interview with physicians, nurses and administrative staff. Text data was systematically coded for analysis, and established methods for ensuring analytical rigor used.
Population Studied: Four practices in two cities, each caring for 4,000-12,000 patients and varying in terms of QOF achievement from below average to near maximum.
Principle Findings: Motivation to change. Providers reported that QOF was highly motivating. Physicians cited substantial financial rewards, public reporting of QOF scores, and belief that the underlying measures represented high-quality care. Non-physicians with no direct financial incentive cited opportunities to take on new responsibilities, and pride in delivering high quality care. Organizational change. Pre-QOF, participants reported sporadic use of chronic disease care management processes such as use of disease registers, most commonly for diabetes. Post-QOF, practices used existing, but under-exploited, electronic medical records to systematically record QOF data, to create registers, to identify and send for patients needing review, and to monitor progress against targets. Clinical care was changed to match QOF requirements by using structured data entry templates embedding clinical guidelines, and through electronic reminders in the consultation. In all practices, new administrators and nurses were employed to help implement QOF, and existing staff took on new tasks around recall and data entry. QOF dominated practice planning in 3 practices, with other quality improvement activity crowded out. The fourth practice invested QOF income in other quality improvement activity, but the financial sustainability of this was being questioned within the practice during the period of observation. In all practices, physicians in particular were concerned that the disease focus in QOF potentially threatened traditional, whole-person primary care, and that non-incentivized diseases like depression were under-treated.
Conclusions: QOF drove significant organizational change towards recommended models of chronic disease care, but it also crowded out other practice generated quality improvement, prompting concern that quality of care might worsen for un-incentivized problems.
Implications for Policy, Practice or Delivery: Providers rapidly responded to pay-for-performance in the UK because the single payer system created coherent incentives, and they could make use of existing, but under-exploited information technology and multi-disciplinary teams. Directly generalizing the QOF experience to other countries is not straightforward, but pay-for-performance may be less motivating in settings where quality measurement, financial incentives and public reporting are fragmented across many payers. Implementation of intended organizational change is likely to be more difficult in settings where information technology and team care are less established.
Funding Source: UK Economics and Social Research Council

Long-Term Care

Incentives, Responses & Measurement in Long-Term Care & Disability

Chair: Brenda Spillman, Ph.D.

Sunday, June 3 • 3:00 p.m.-4:30 p.m.

▪ The Impact of State Policies on Nursing Home Residents' Outcomes

Vincent Mor, Ph.D., Zhanlian Feng, Ph.D., Orna Intrator, Ph.D., David Grabowski, Ph.D., Jacqueline Zinn, Ph.D.

Presented By: Vincent Mor, Ph.D., Professor and Chair, Community Health, Brown University Medical School, Box G-s121, Providence, RI 02912, Phone: (401) 863-2959, Fax: (401) 863-3713, Email: Vincent_Mor@brown.edu

Research Objective: We test the hypothesis that increases in states' Medicaid nursing home payment rate will contribute to improvements in residents' clinical quality outcomes and that the introduction of case mix reimbursement may lower the level of improvement in quality.
Study Design: Data are derived from OSCAR and linked aggregated MDS measures for all Medicare/Medicaid certified nursing homes. We used a facility fixed-effects (difference-in-differences) model, controlling for calendar quarter, market characteristics as well as changing case mix acuity and annual admission volume per facility to test the hypotheses. We defined four (4) distinct measures of clinical quality as the proportion of residents with the condition over 24 quarters: 1) decline in ADL over 3 months; 2) new or worsening pressure ulcers over 3 months; 3) persistent or worsening pain over 3 months; and 4) physical restraint use. The first three measures are risk adjusted and change-based, the 4th unadjusted and prevalence-based. The unit of analysis is a facility per calendar quarter. Data on state policies regarding payment rates and policies come from ongoing surveys of states' nursing home policies done by Brown University.
Population Studied: Quality measures based on all residents in all urban, non-hospital based facilities in the 48 contiguous US states between 1999 and 2004 (N=9,297 unique facilities, with 195,344 quarterly measurements).
Principle Findings: All four quality measures improved over time (particularly the proportion of facilities achieving a high performance threshold). We find that a $10 increase in the Medicaid payment rate was associated with a reduction of 2.3% in the ADL decline rate; shifting from an average of 11% of residents declining 4 or more ADL points to less than 9% of residents declining. Increases in Medicaid payment rates also were associated with decreases in persistent pain; they were not associated with worsening pressure ulcers, but were associated with increased rates of restraint use. The adoption of case mix reimbursement by states was not related to ADL decline nor to pressure ulcer worsening but was related to a significant increase in restraint use and in persistent pain. The effects observed are counter balanced by a large increase in case-mix acuity over the same period.
Conclusions: This is the first effort to test the impact of changes in states' nursing home policies on the quality of care experiences of US nursing home residents that takes advantage of longitudinal clinical data while applying an analytic model that minimizes the measurement problems associated with these data. While much improvement is needed both in measuring nursing home quality and in actually improving care and quality of life, our results tell a rare positive story about nursing homes.
Implications for Policy, Practice or Delivery: Increasing Medicaid payments are associated with improvements in quality outcomes, or at least serve to moderate the greater pressure on quality performance that arises as state based case mix reimbursement policies act to increase case mix acuity.
Funding Source: NIA

- **Understanding Self-Reported Disability among the Elderly**

Kate Stewart, M.S., Mary Beth Landrum, Ph.D., Patricia Gallagher, Ph.D., David M. Cutler, Ph.D.,

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Research Objective: Recent studies reported declining disability among the elderly over the past 25 years. It is unclear whether the observed decline reflects improvements in health, increased use of assistance and access to better environments and services, or a combination of these factors. We conducted a new survey of elderly to test whether use of various technologies and environmental factors were important determinants of self-reported disability, and whether increased use of these factors explained any of the recent declines in disability.
Study Design: In-person survey with a random sample of elderly persons in the greater Boston area. The survey included existing questions about disability walking around inside, grocery shopping and preparing meals from the National Long Term Care Survey (NLTCS) and a series of questions about use of technologies (e.g. walking aids, microwaves), and environmental factors (e.g. van service to the grocery store, ramps outside the home, living in senior housing) that may affect survey responses. To compare survey responses with objective measures of functioning, willing participants completed a short test of lower-extremity functioning, the Short Physical Performance Battery (SPPB). For those factors associated with

a lower likelihood of self-reported disability, we obtained data from secondary sources on prevalence of use between 1982 and 1999, the first and most recent NLTCS survey years.
Population Studied: 438 English-speaking, non-demented, community-dwelling elderly age 70 and older
Principle Findings: 59 respondents (13%) reported disability walking around inside. Of these, 80% 'always' or 'usually' used walking aids, 14% 'sometimes' used aids and 7% did not use aids. 86 respondents (20%) used walking aids and did not report disability. Of these, 70% used aids 'sometimes' and 30% 'always' or 'usually' used aids. 66 respondents (15%) reported disability grocery shopping. Female respondents using van service to and from the grocery store were significantly less likely to report disability ($p<0.05$), after adjusting for demographics and health status and SPPB score. We estimate that increased use of van transportation in the greater Boston area between 1982 and 1999 explains approximately 7.5% of the decline in disability grocery shopping among elderly women. 20 respondents (5%) reported disability preparing meals, but none of the technologies studied were associated with lowered self-reported disability.
Conclusions: Both health and non-health factors are important determinants of survey responses. Many elderly respondents with intermittent functioning problems and/or those who used various technologies or environmental factors did not report disability. Recent declines in disability may be explained by changes in both physical functioning and increased use of improved or new technologies and environments.
Implications for Policy, Practice or Delivery: Elderly may need more assistance with daily tasks than apparent from existing survey measures; the need for assistance will likely increase with the aging population. Analysts and policy-makers using existing survey data to project future medical care costs and active life expectancy need to be aware that the average level of functioning among the non-disabled population likely declined over time, as better environments and assistance compensated for functioning problems and lowered the likelihood of reporting disability.
Funding Source: NIA

- Why are Nursing Homes' Quality Report Cards Important? Evidence from California

Irena Pesis-Katz, A.B.D., Charles Phelps, Ph.D., Helena Temkin-Greener, Ph.D., William Spector, Ph.D., Dana B. Mukamel, Ph.D.

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Research Objective: This study examines the role of different quality of care dimensions on the choice of a nursing home (NH), once the decision to enter a NH has been made. When choosing a NH, consumers may have difficulties evaluating some aspects of quality, such as clinical quality (unobservable quality), compared with observable quality such as hotel services. We hypothesize that the choice will be more likely to depend on observed quality than unobserved quality.
Study Design: The study examines nursing home choices in 2001, a period prior to publication of the federal Nursing Home Compare report card. It thus covers a period in which clinical quality is unobservable. We model nursing home choice by estimating a conditional multinomial logit model. We estimate the impact of facility and individual characteristics that may influence consumer's choice, and examine the independent role of observable quality and unobservable quality. Observable quality is measured by categories of quality deficiencies that capture aspects such as room and board. Unobservable quality includes four of the CMS clinical quality measures (QMs): percent of residents with declined Activities of Daily Living, with infectious disease, with pressure ulcers, and with physical restrains. Data included MDS, OSCAR, states specific cost reports and census data.
Population Studied: 22,987 long-term care NH admissions in 2001 in California. The sample includes only Medicaid and private pay residents, since we excluded short-term NH stay.
Principle Findings: Medicaid and private pay consumers are less likely to choose NHs with lower observed quality (OR=0.18 and 0.007 respectively, $p<0.01$). The impact of unobserved quality is mixed. The QM based on physical restraints was not significantly associated with the choice. The other QMs did exhibit a significant association in some models, but unlike the odds ratios for the observable quality, the odds ratios were very close to 1. In addition to quality of care, choice was significantly (at the

0.01 level) associated with distance (OR= 0.83 for Medicaid and 0.74 for private pay); for profit status (OR =1.42 for Medicaid and 0.71 for private pay); size (OR=1.002 for both groups); and price (OR=0.99 for private pay but not significant for Medicaid).
Conclusions: As hypothesized, consumers are much more likely to choose a NH with higher observed quality of care, regardless of payer type. However, unobserved clinical quality does not seem to impact the probability of choice to the same degree.
Implications for Policy, Practice or Delivery: This study examines the role of quality of care in a nursing home choice in an era prior to the publication of quality report cards. Our findings suggest that in the absence of report cards, choice of a NH depends mostly on observable quality and not clinical quality, leading to unbalanced incentives for nursing homes – i.e. incentives to invest resources preferentially in areas related to observable quality. Report cards can, therefore, play an important role by revealing previously unobserved quality and potentially increasing the sensitivity of demand to clinical quality as well.

- **Do Changes in Service Delivery Following the Introduction of Medicare Home Health PPS Differ by Agency Ownership?**

Timothy Peng, Ph.D., Christopher Murtaugh, Ph.D., Ann Meadow, Sc.D., Stanley Moore, B.A., Nelda McCall, Ph.D.

Presented By: Timothy Peng, Ph.D., Senior Research Scientist, Center for Home Care Policy and Research, Visiting Nurse Service of New York, 1250 Broadway, 20th Floor, New York, NY 10001-3701, Phone: (212) 609-5765, Fax: (212) 290-3756, Email: tpeng@vnsny.org

Research Objective: To examine differences in the response of non-profit and for profit home health agencies to the financial incentives of the Medicare home health prospective payment system (PPS). In particular, we examined changes in rehabilitation therapy visits in light of a large increase in payment when patients receive 10 or more visits within a 60-day payment period.
Study Design: We used a pre-post quasi-experimental design to examine differences between non-profit and for-profit home health agencies in changes in: (1) the average length, and the number and types of visits provided during a home health episode; (2) provision of therapy services above and below the payment threshold; and (3) patterns of Medicare rehabilitation service use preceding and during the home health episode. The first two years after the introduction of PPS (i.e., FFY 2001 and FFY 2002) were compared with the year prior to PPS (i.e., FFY 2000). Both unadjusted and risk-adjusted rehabilitation use were estimated.
Population Studied: A 1% sample of beneficiaries was drawn from the Medicare Denominator File and linked to claims data extracted from CMS Standard Analytic Files to develop a total of 44,653 episodes of home health care provided to Medicare FFS beneficiaries during calendar years 1999-2002. Excluded from the analysis were episodes with fewer than 5 visits (which are paid on a per-visit basis) and episodes greater than 60 days in length (a single payment episode).
Principle Findings: We found that the response to payment incentives was greater, in general, among for-profit agencies compared to non-profit agencies. For both groups there was a reduction in skilled nursing and especially home health aide visits post-PPS, while rehabilitation therapy increased and became a larger share of visits provided. Consistent with PPS financial incentives, there was a decrease in the number of episodes with less than the number of therapy visits needed to increase payment: from FY 2000 to FY 2001, there was a 10% decrease for non-profit agencies and a 13% decrease among for-profit agencies in episodes with no therapy visits, and a decrease in 1% and 11% in episodes with 1 to 9 therapy visits, respectively. There was an increase of 24% for non-profit agencies and 60% among for-profit agencies for episodes with visits at and just above the therapy payment threshold (10-19 visits). Among episodes with therapy visits well above the threshold (20+ visits), for which there are no additional payment incentives, there was a 1% increase among non-profit agencies and a 28% decrease among for-profit agencies. Differences between FY 2000 and FY 2002 followed the same incentive-sensitive pattern, with larger relative increases/decreases. This pattern was evident among patients irrespective of whether they received rehabilitation therapy in other settings prior to home health admission. Risk-adjustment using a comprehensive set of demographic, prior utilization, community, clinical and functional measures attenuated the magnitude, but did not change the pattern, of these results.
Conclusions: Our results provide new evidence on the power of financial incentives to affect provider behavior. Prior research has suggested

that these changes have occurred without major shifts in the types of actual beneficiaries served. Future studies should establish whether the practice pattern change has led to better patient outcomes. The results also demonstrate that for-profit providers responded with greater alacrity to rehabilitation incentives in the home health PPS. The rapid, strong shift towards levels of rehabilitation therapy rewarded by PPS in home health occurred regardless of rehabilitation received in other settings, underscoring the need for research analyzing possible problems of both over- and under-use of rehabilitation therapy across multiple sites of care.

Implications for Policy, Practice or Delivery: Providers consistently have demonstrated strong responses to shifting incentives arising from policy change. Policymakers face a difficult task in implementing systems that ensure appropriate provision of services to beneficiaries while maintaining accuracy in provider reimbursement. The challenge for policymakers is to use incentives to achieve important policy objectives while avoiding unintended negative consequences.

Funding Source: RWJF

- Did the Publication of the Nursing Home Compare Report Card Lead to "Cream Skimming" by Nursing Homes?

Dana Mukamel, Ph.D.

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Research Objective: A common concern with quality report cards is the potential for adverse selection by providers, i.e. "cream skimming". The Nursing Home Compare report, published nationally since 2002, provides information about 19 different quality measures (QMs). These QMs have only a limited risk adjustment. Therefore, nursing homes may choose to deny admission to patients who are at higher risk for poor health outcomes, if these risks are inadequately accounted in the QM for and if they believe this might improve their reported scores. This study tests the hypothesis that nursing homes changed the type of individuals they admit, following publication of the report.

Study Design: MDS data for periods before and following publication were used to create variables describing the admission cohort in each quarter for each nursing home. This admission profile included: average number of activities of daily living (ADLs) limitations, percent of new residents with pressure sores, percent with dementia, and percent with urinary incontinence. These conditions were chosen because of their potential impact on the published quality scores. We estimated regression models in which the dependent variables were the admission profile variables (e.g. percent with dementia) and the independent variables included time, an indicator of pre/post publication, and an interaction term of the time variable with the pre/post publication variable. This specification allowed for testing of hypotheses about changes in the trend in admission profiles, both in terms of change in slope and change in level. These models were estimated as random effect models with robust and clustered standard errors. The analysis was repeated for a subset of facilities with 100% occupancy, because these facilities face no "empty bed" costs when refusing admission to high risk individuals, and are therefore more likely to engage in cream skimming than facilities with lower occupancy.

Population Studied: All (250,511) newly admitted long-term care residents in 2001-2005 to all 14,462 Medicare and Medicaid certified facilities that had at least 1QM reported.

Principle Findings: The data show an ongoing trend (starting in 2001) towards increased admissions of sicker and frailer individuals. There was a significant change ($p<0.05$) in the trend towards admission of fewer individuals with incontinence and dementia, consistent with the cream skimming hypothesis. However, there was also a significant change in the trend towards increased admissions with pressures sores and more ADL limitations. Among those facilities with 100% occupancy, all changes for all measures are towards less debilitated individuals, although none of these reach significance at the 5% level.

Conclusions: There is evidence that nursing homes have engaged in limited cream skimming following publication of the report cards: they are admitting fewer people with dementia and urinary incontinence. There is no evidence of similar avoidance of individuals with higher ADLs or pressure sores.

Implications for Policy, Practice or Delivery: Evidence of cream skimming by nursing homes raises concerns that the publication of the Nursing Home Compare report card may limit access for sicker individuals. Policies to address

this, including a more comprehensive risk adjustment of the QMs, should be considered.
Funding Source: NIA

Transitions Between Care Providers: Risks & Opportunities

Chair: D.E.B. Potter, M.S.

Monday, June 4 • 2:30 p.m.-4:00 p.m.

▪ The Effects of Health and Living Arrangement Transitions on the Timing to Nursing Home Entry

Liliana Pezzin, Ph.D., J.D., Judith A. Kasper, Ph.D., J. Bradford Rice, M.A.

Presented By: Liliana Pezzin, Ph.D., J.D., Associate professor, Medicine, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226, Phone: (414) 456-8862, Fax: (414) 456-6689, Email: lpezzin@mcw.edu

Research Objective: To characterize the patterns of living arrangement trajectories experienced by elderly persons and to estimate the effect of living arrangement transitions (controlling for functional and cognitive health and other factors) on probability and timing of nursing home entry.
Study Design: We apply a competing risk, Gompertz hazard model to data on a cohort of elderly persons with measures at 5 different points in time over a 10-year period (1993-2002). Controlling for the number and type of living arrangement transitions, demographic, socio-economic, and health characteristics, we estimate the independent effect of type and stability of community living arrangements on months to nursing home entry. Given these findings we simulate across and within living arrangement effects of severe (3+) ADL disability and dementia to find time to institutionalization.
Population Studied: Data from the first five waves of the Assets and Health Dynamics of the Elderly Surveys (HRS-AHEAD), a nationally representative, longitudinal survey of older Americans were used. The baseline sample includes 8,219 respondents aged 70 or older who were living in the community in 1993. Respondents were censored at 120 months of follow-up or at death.
Principle Findings: 28% of all elderly persons experienced at least one transition in community living arrangements during the 10-year study period. Of those, nearly one-third experienced multiple transitions. Regardless of initial living arrangement, the risk of nursing home entry was significantly higher among elderly persons experiencing multiple community transitions (HR=3.2). Living continuously alone (HR=2.6) or with non-relatives (HR=2.2), having 3+ ADL disabilities (HR=2.0) and developing dementia (HR=2.2) were the next largest significant risks for institutionalization. Adjusted estimates and marginal effects, calculated at the individual-level using parameters forthcoming from the multivariate duration model, indicate that stable living arrangements, particularly living continuously with a spouse and living continuously with an adult child, were the most "protective" types of living arrangement (i.e., living arrangements that reduced the probability of nursing home entry and increased months of community residence). Moving in with non-family after the loss of a spouse, on the other hand, decreased community residence by 51 months relative to living continuously with a spouse. For each living arrangement pattern, persons with dementia, and to a lesser extent those with severe ADL disability, tended to enter a nursing home significantly earlier than the general population. On average, persons with dementia entered a nursing home 34-38 months sooner than those without dementia in each of the living arrangements. Severe ADL disability reduced time to nursing home entry by 28-31 months.
Conclusions: Risk of institutionalization increases significantly with transitions in community living arrangements. Interventions with even a modest impact on preserving living arrangement stability, particularly coresidence with an adult child, may significantly reduce nursing home admissions.
Implications for Policy, Practice or Delivery: Given the increasing numbers of elderly persons and the unresolved questions concerning the effectiveness of alternative programs designed to enhance "aging in place," the results of this study has important implications for both policy and program development.
Funding Source: NIA

▪ Targeting Nursing Home Residents for Transition to the Community

Greg Arling, Ph.D., Robert L. Kane, M.D., Julie Bershadsky, B.A., Teresa Lewis, B.A.

Presented By: Greg Arling, Ph.D., Visiting Associate Professor, School of Public and Environmental Affairs & IU Center for Aging Research, Indiana University - Purdue University

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Research Objective: Develop comprehensive targeting criteria that states can use to identify nursing home residents for transition to the community.
Study Design: Targeting criteria were derived from a readily available data source, Minimum Data Set (MDS). Criteria included: (1) resident's preference to return to the community and having a person who supports that choice; (2) low need for nursing home services, i.e., light care RUG-III case mix groups; and 3) health, functional, or personal characteristics indicating minimal risk of becoming a long-stay resident. Using multilevel models, these criteria were applied to a nursing home admission cohort and a cross-sectional sample of residents. Also, we estimated the number of residents per facility who met targeting criteria.
Population Studied: Admission cohort of all first-time nursing home admissions (N=25,739) to Minnesota nursing facilities from July 1 2004 to June 30 2005; and cross-sectional sample (N=30,284) of all Minnesota NH residents on February 15 2005.
Principle Findings: Most nursing home admissions have short stays and subsequently return to the community. Four-fifths of residents were discharged within 6 months of admissions and two-thirds returned to a private residence or assisted living. Over 80% of persons at admission preferred to return to the community and 66% indicated having a support person who supported that choice. Nearly three-fourths of residents with a preference to return (73%) or with a supportive person (74%) ended up returning to the community, while the majority of admissions not expressing a preference to return or not having a support person either remained in the nursing home (37-39%) or died (42-36%). Among residents remaining in the facility at 180 days, 56% had expressed a preference to return to the community and 41% had indicated having a support person. These trends were weaker in the cross-sectional sample, where 21% had expressed a preference to return and 13% the availability of a support person based on their most-recent admission or annual MDS assessment. Persons least likely to become long stay residents were younger, married, male, continent, not cognitively impaired, independent in ADLs, admitted from acute hospitals, and non-Medicaid. Only 4% of admissions met the RUG-III low service need definition; however, 16-21% of residents at 180 days and 15-19% of residents in the cross-sectional sample met this definition. Targeting algorithms based on criteria of personal choice, low service need and low risk of nursing home care resulted in wide variation in number of targeted residents per facility.
Conclusions: Targeting criteria for nursing home transitions should be multidimensional. Although transition should be open to all, programs should focus on residents with stays of 90-270 days, after most short-stay discharges have occurred yet when residents' community ties are intact, they are most likely to meet targeting criteria, and transition will have the greatest impact on future nursing home use.
Implications for Policy, Practice or Delivery: Although MDS-based targeting criteria can be effective in the initial stages of nursing home transition programs, these criteria should be refined as evidence accumulates about factors related to successful transitions.
Funding Source: MN Dept of Human Services

- **The Costs and Potential Savings Associated with Nursing Home Hospitalizations**

David Grabowski, Ph.D., James O'Malley, Ph.D., Nancy R. Barhydt, Dr.P.H., R.N.

Presented By: David Grabowski, Ph.D., Associate Professor, Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, MA 02115, Phone: (617) 432-3369, Fax: (617) 432-3435, Email: grabowski@med.harvard.edu

Research Objective: Hospitalization of nursing home residents is quite prevalent with over 15% of long-stay nursing home residents hospitalized within any given 6-month period. A significant number of these hospitalizations are for conditions such as respiratory infection, urinary tract infection and congestive heart failure, which could potentially be prevented or treated in the nursing home. Yet, there has been little research documenting the costs associated with nursing home hospitalizations, or more importantly, with potentially avoidable hospitalizations. Using a merged individual-level hospital-nursing home file for New York State, we estimate the costs associated with total and potentially avoidable nursing home hospitalizations over the period 1999-2004.
Study Design: The costs associated with nursing home hospitalizations in New York State were obtained by linking two administrative databases for the period 1999-2004. Individual nursing home data were obtained from the

Minimum Data Set (MDS) assessment instrument. The MDS assessments were linked with the Statewide Planning and Research Cooperative System (SPARCS) hospital inpatient data set. We identified those hospitalizations with an Ambulatory Care Sensitive (ACS) primary diagnosis, which potentially could have been prevented or treated in the nursing home, as potentially avoidable.
Population Studied: Over our period of study, we had MDS data from 690 distinct nursing homes in New York State. Given the different factors associated with hospitalizations among short-stay (post-acute care) and long-stay (custodial care) nursing home residents, we limited our analysis to long-stay (>120 days) residents. Over our period of study, we had SPARCS data from 253 distinct hospitals. We only consider inpatient hospital costs in this study.
Principle Findings: These data are suggestive of significant costs associated with hospitalizations from the nursing home setting. Specifically, we estimate approximately $971.7 million was spent on hospitalizations from the nursing home setting in New York State in 2004. Expenditures on ACS hospitalizations constitute $223.8 million (or 23%) of this total, of which Medicare was the primary payer for expenditures totaling $188.5 million (84%) and Medicaid for expenditures totaling $26.5 million (12%). Five conditions—pneumonia, kidney/urinary tract infection, congestive heart failure, dehydration and chronic obstructive pulmonary disease—account for 85% of overall ACS costs. After adjusting for inflation, the results also indicate a 29% increase in total hospital expenditures and a 7% increase in ACS hospital expenditures over the period of study.
Conclusions: These results underscore the idea that policies directed at decreasing potentially avoidable nursing home hospitalizations have the potential to generate significant savings for Medicare, and to a lesser extent, Medicaid.
Implications for Policy, Practice or Delivery: Potentially avoidable nursing home hospitalizations are a direct function of the conflicting incentives facing state Medicaid programs. In New York, Medicaid covers roughly 80% of nursing home costs, but pays a relatively small fraction of the costs for hospitalized nursing home residents. Although many hospitalized nursing home residents may be effectively cared for in the nursing home setting given the presence of additional resources, state Medicaid programs have less economic incentive to provide nursing homes with additional resources to prevent hospitalizations. Policy options to address these conflicting incentives include capitation and Pay-for-Performance.
Funding Source: CWF

- Using the MDS to Evaluate Progress on Long-Term Care Reform

Edith Walsh, Ph.D., Angela M. Greene, M.B.A., M.S., Yevgeniya Kaganova, Ph.D.

Presented By: Edith Walsh, Ph.D., Senior Health Policy Researcher, Aging, Disability and Long-Term Care, RTI International, 1440 Main Street, Suite 310, Waltham, MA 02451, Phone: (781) 434-1754, Fax: (781) 434-1701, Email: ewalsh@rti.org

Research Objective: The goal of this research was to pilot analyses useful for monitoring and evaluating states' progress in long-term care reform. Under the Systems Change grant program, CMS has awarded about $240 million in approximately 300 separate awards to states and Independent Living Centers for this purpose. LTC reform efforts are diverse, varying in their goals, scope and timing and there are no direct measures readily available to evaluate such activities.
Study Design: We used admission and discharge assessment data, from the Nursing Home Minimum Data Set, linked to facility characteristics from the OSCAR data, state-level LTC policy and supply variables to identify who is admitted to and discharged from nursing homes and how this relates to LTC policy. The analysis included national and state-level descriptive and multivariate analyses, time trend analysis, effect decomposition and marginal effects analyses, looking at profiles of new entrants and discharge destinations. We hypothesized that in states with greater investments in HCBS and other LTC reform features facility entrants would be more impaired on average, and a larger proportion would be discharged to the community and to the community with services.
Population Studied: Facility residents under age 65 and age 65 and over with Medicaid coverage admitted to or discharged from a nursing facility between January 2003 -June 2005 and with a stay longer than 30 days.
Principle Findings: Over time, nationally and in many states, ADL scores on admission are increasing and an increasing proportion of long-stay residents are being discharged to the community and to community with services, although there is wide variation across states and between residents under 65 and over age 65.

The mean ADL score on admission during the study period was 9.7 (range 6.7 – 12.5) for residents under 65, and 11.2 (9.5 – 13.5). The likelihood of discharge to the community was 50% (29% with services) for residents under 65, and 21% (15% with services) for the older group. State policy variables, especially the ratio of Medicaid HCBS expenditures to total LTC expenditures were significant predictors of these outcomes. There were also some differences associated with facility characteristics such as size and ownership as well as individual demographic characteristics.

Conclusions: The increasing functional impairment levels of newly admitted long-stay facility residents and the proportion of long-stay residents returning to the community are potential indicators of the effects of state rebalancing efforts. The time trends were significant in all models indicating that even holding other factors constant, the LTC system is moving gradually in the desired direction. The multivariate results also indicate the observed changes are related to state policies.

Implications for Policy, Practice or Delivery: With some refinements, monitoring state and national trends in nursing facility data is feasible and could be used on an ongoing basis both by states and CMS. States might also use this information to enhance their targeting efforts for nursing facility transition programs. CMS and other funders could also use these data to target states or to guide the design of future grants.

Funding Source: CMS

▪ Does High Caregiver Stress Lead to Nursing Home Entry?

Brenda Spillman, Ph.D., Sharon Long, Ph.D.

Presented By: Brenda Spillman, Ph.D., Senior Research Associate, Health Policy Center, The Urban Institute, 2100 M Street NW, Washington, DC 20037, Phone: (202) 261-5846, Fax: (202) 223-1149, Email: bspillma@ui.urban.org

Research Objective: As the number of elders rises over the next few decades, the success of state and federal efforts to "rebalance" the long term care system away from nursing homes and toward community care is likely to depend heavily on the willingness and ability of informal caregivers to maintain disabled elders in their homes. We explore the role of caregiver stress or burden in the nursing home entry decision. We use a comprehensive model of how formal care, informal care, and the caregiver's perceived stress from caregiving relate to nursing home episodes that may be or become permanent placements. We address the questions: 1) Does a high level of caregiver stress predict nursing home entry? and 2) What factors are associated with high levels of caregiver stress? We simulate the potential impacts of reducing overall caregiver stress and specific factors associated with caregiver stress on nursing home placement.

Study Design: We use survey data on a nationally representative sample of elderly persons with chronic disability and their primary informal caregivers to model nursing home entry over periods of up to two years after the interview. Nursing home entry is modeled as a function of baseline paid formal care, informal care, and stress experienced by caregivers. Formal and informal care hours are jointly determined, and they both affect and are affected by caregiver stress. We therefore use a two-stage instrumental variables (IV) model to control for biases that can result when explanatory variables are endogenous to the outcome. We also use a probit model to examine key predictors of caregiver stress in a supplemental analysis.

Population Studied: Our study population, drawn from the 1999 National Long Term Care Survey and its Informal Caregiver Supplement, is elderly persons who receive informal assistance with their chronic disabilities and their primary informal caregivers. Minimum Data Set records merged with the survey data allow us to observe all nursing home admissions occurring over a 5-year follow-up period.

Principle Findings: Elders with highly stressed caregivers are more likely than their counterparts with less stressed caregivers to have a long-term nursing home placement over follow-up periods of up to two years. Furthermore, we find that the level and intensity of the recipient's care needs were important predictors of high caregiver stress, while personal characteristics and living situation were not. Physical strain from caregiving was the most important predictor of high levels of stress, but indicators of the disruptive aspects of caregiving also were important, as was financial hardship.

Conclusions: Reducing important stress factors such as physical strain and financial hardship would significantly reduce caregiver stress and, as a result, nursing home use for chronically disabled elders.

Implications for Policy, Practice or Delivery: Our analysis provides support for initiatives to reduce caregiver stress among persons caring for chronically disabled elders as a strategy to reduce or defer nursing home entry and perhaps

to underpin current efforts to return nursing home residents to community-based care.

Help Wanted: A Workforce for Higher Quality LTC

Chair: Christine Bishop, Ph.D.

Tuesday, June 5 • 1:30 p.m.-3:00 p.m.

▪ The Gap Between Nurse Staffing and Changing Demands of Nursing Home Resident Care: A Challenge for Quality Improvement

Ning Zhang, M.D., Ph.D., M.P.H., Lynn Unruh, Ph.D., R.N., Thomas Wan, Ph.D.

Presented By: Ning Zhang, M.D., Ph.D., M.P.H., Assistant Professor, Health Administration, University of Central Florida, 3280 Progress Drive, Orlando, FL 32826, Phone: 407-823-3344, Fax: 407-823-0744, Email: nizhang@mail.ucf.edu

Research Objective: The aging of the U.S. population and the continued focus on healthcare cost savings put increasing pressure on the demand and supply of nursing home services, and on the level and type of nurse staffing needed to provide those services. This study accesses whether the level and type of nurse staffing meet the increasing and changing demands of nursing home resident care, and whether there is a potential maldistribution of nurse staffing mix across specific demands of nursing home residents.
Study Design: Nine-waves of longitudinal nursing home data from the Online Survey, Certification, and Reporting (OSCAR) annual survey were merged as a major analytical database. Trend analyses were used to examine the direction and extent to which the changes in nurse staffing are consistent with the changes of resident demands from 1997-2005. For each type of nursing staff (RN, LPN, NA and total nurses), the trend with resident demands was linked in two ways: RNs were trended with special care and Medicare beds; LPNs with medications and catheters; NAs with ADLs and pressure sores; and total nursing staff with higher acuity and higher severity-adjusted deficiencies.
Population Studied: Trend analyses were conducted separately for all CMS -certified, Medicare only, Medicaid only, and private-pay only nursing homes. The study population included 143,673 facilities (on average 15,964/year) after data cleaning on both staffing and demand variables.
Principle Findings: Preliminary trend analysis results indicate that nurses per resident per day, nurse skill mix, and resident care demands change at different rates and directions. Mismatches were evidenced between increasing resident demands and decreasing or more slowly increasing staffing. Increases in severity-adjusted deficiencies also outpaced staffing capacity. Decreases in staffing were more likely to occur with RNs, whereas increases were more likely to be with NAs, irrespective of resident needs. Although resident demands have been increasing in all types of nursing homes, Medicare-certified-only facilities most consistently demonstrated a reverse staffing pattern for RNs, whereas Medicaid-certified-only nursing homes had consistent increases in RNs.
Conclusions: The capacity of nursing home staffing appears to have lagged behind the increasing demands of nursing services in recent years. Continuous staffing reductions at all levels in Medicare-certified-only nursing homes is worth attention. In order to achieve nursing home quality improvement nurse staffing should match resident demands.
Implications for Policy, Practice or Delivery: Nurse staffing has been perceived as one of the key factors in improving nursing home performance, while resident demands have been recognized as key factors in measuring nursing adequacy by the Institute of Medicine Committee on the Adequacy of Nurse Staffing in Nursing Homes. It is imperative to understand the dynamic relationships between resident demands and staffing capacity. Knowledge on how to improve nurse staffing and appropriately adjust their skill mix will help federal and state policymakers and nursing home administrators strengthen the quality of care and better prepare for the changing resident care needs of the upcoming elderly and diverse populations requiring nursing home care.
Funding Source: CMS

▪ What Culture Change Entails: A Study of 18 Nursing Homes

Dana Weinberg, Ph.D., Rebekah Zincavage, M.A., Almas Dossa, M.P.H., M.S., Susan G. Pfefferle, Ph.D.

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Research Objective: This study contributes to research on culture change in long-term care by providing an empirical investigation of what culture change entails. We investigate the philosophies of care, work practices, management philosophies, and human resource practices in nine homes engaged in culture change compared to those in a group of nine other high-quality homes likely to be engaged in care improvement efforts but not affiliated with culture change programs.
Study Design: The data for this project consist of intensive case studies of organizational, management, and caregiving practices on two units in each of 18 NFs (35 units total).
Population Studied: We compare nine homes engaged in culture change compared to a group of nine other high-quality homes likely to be engaged in care improvement efforts but not affiliated with culture change programs.
Principle Findings: The one factor differentiating culture change facilities is a philosophy of care that emphasizes person-centered or individualized care. Some of the culture-change facilities adopted a complex of practices to promote person-centered care. These practices included organizing care around individuals through consistent assignment of staff to residents; producing care on demand by supporting CNAs' autonomy, flattening organizational hierarchies, and emphasizing that attending to residents' needs is everyone's job; and finally obtaining and sharing information about residents through soliciting CNAs' input into care plans, their attendance at care planning meetings, and their participation in organizational decisions. In addition, some of the culture change facilities had top managers who shared a high involvement management philosophy, while all of the other facilities were characterized by high control philosophies among top managers. High involvement management philosophies supported person-centered work practices while high control philosophies undermined them. Middle managers' philosophies played a crucial role in supporting or undermining person-centered work practices, but high involvement philosophies among middle managers existed in both types of facilities. Nursing homes faced significant barriers to providing person-centered care. Many of these barriers reflected a lack of human resource practices designed to support the high involvement of frontline workers necessary for providing person-centered care.
Conclusions: Findings suggests that culture change is mainly a re-envisioning of what a nursing home's goals are and how it should operate, rather than a sustained set of changes to care. Structural enhancements like neighborhoods or private rooms play a supporting role but in themselves, they neither guaranteed nor prevented culture change. Unlike an architectural renovation, culture change was not something that could be built and finished but rather represented an ongoing process that had to be continually enacted. The homes that were most successful in their culture change endeavors accomplished person-centered care and staff autonomy more often than not, but in every culture change home culture change was an ongoing struggle, won and lost during the course of day.
Implications for Policy, Practice or Delivery: The common and pervasive barriers to providing person-centered care, particularly those barriers related to the quality of frontline jobs, threaten sustainability of culture change efforts. Without broader changes in the industry that would support greater investment in workers, culture change can only be a vision rather than an accomplished reality.
Funding Source: RWJF, Atlantic Philanthropies

- **The Impact of State Medicaid Payment Rates & Case-Mix Reimbursement on Nursing Home Staffing, 1996-2004**

Zhanlian Feng, Ph.D., David C. Grabowski, Ph.D., Orna Intrator, Ph.D., Vincent Mor, Ph.D., Jacqueline Zinn, Ph.D.

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Research Objective: Since Medicaid accounts for two-thirds of all nursing home residents, it is important to understand the impact of state Medicaid payment rates and policies on nursing home staffing levels. Previous studies on this issue are limited by the use of cross-sectional data and offer mixed evidence. We address this gap by using recent national longitudinal data to determine whether increases in state Medicaid payment rates and the adoption of case mix reimbursement are associated with higher nurse staffing ratios.
Study Design: We defined a 5-category, multinomial response classifying levels of total direct care staff (RNs, LPNs and CNAs combined) hours per resident day (HPRD) as

reported in each survey. HPRD levels were based on expert-recommended staffing thresholds: (1) below 2.75 HPRD (reference category), (2) 2.75-2.99 HPRD, (3) 3.00-3.89 HPRD, (4) 3.90-4.44 HPRD, and (5) above 4.44 HPRD. We estimated a multivariate, multinomial logistic regression model controlling for repeated observations per facility, and included state and calendar year fixed effects as well as relevant facility and market characteristics.
Population Studied: All urban, non-hospital based nursing homes in the 48 contiguous U.S. states, with annual certification surveys available in the Online Survey Certification and Reporting (OSCAR) data file covering 1996 to 2004 (N=78,242 surveys from 10,046 facilities) merged with data on state Medicaid payment policies for the same period.
Principle Findings: Over the nine-year period, increasingly there were more facilities in the three middle categories (levels 2-4) but the proportion of facilities in both the lowest (level 1) and the highest (level 5) staffing levels decreased over time. On average, for each $10 increase in the inflation-adjusted Medicaid payment rates, facilities were 4% less likely to be in the lower-medium staffing level (2.75-2.99 HPRD), 7% more likely in the medium level (3.00-3.89 HPRD), 22% more likely in the upper-medium level (3.90-4.44 HPRD), and 14% more likely in the highest level (above 4.44 HPRD), as opposed to the lowest level (below 2.75 HPRD). Facilities in states that adopted case mix reimbursement, on average, were 28% more likely to have a lower-medium staffing level (2.75-2.99 HPRD) but 10% and 34% less likely to reach the medium and upper-medium levels, respectively, as opposed to the lowest level below 2.75 HPRD (no effect on the highest level).
Conclusions: Higher Medicaid payment rates appear to be associated with increases in total direct care staffing levels but this effect is not linear. The adoption of case-mix reimbursement is associated with an initial increase in staffing levels up to a point (3.0 HPRD), after which the effect is lost or even reversed.
Implications for Policy, Practice or Delivery: An increase in Medicaid rates would enable nursing homes to hire more direct care staff. In addition, our findings suggest that it is the absolute level of Medicaid payments that influences increasing nursing home staffing more than the adoption of case mix reimbursement.
Funding Source: NIA

- Former Family Caregivers and Future Homecare Work

Kathryn G. Kietzman, M.S.W., R.E. Matthias, Ph.D., Kathryn G. Kietzman, M.S.W.

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Research Objective: To understand the careers of family and friends hired as home care workers, and the potential for retaining them in the long-term care workforce.
Study Design: A telephone survey was conducted with 383 randomly-selected former paid home care workers in California's In-Home Supportive Service (IHSS) program. All were family or friends hired by recipients under IHSS' consumer-directed model. Of these, 203 were leavers, no longer working in home or health care, and 180 were stayers, currently working in home or health care. To compare the stayer and leaver groups, we used t-test, chi-square, and multivariate analyses and assessed demographics, attitudes about work and caregiving, work histories, and the initial IHSS work experience.
Population Studied: The target population consisted of 44,442 paid IHSS workers who provided care to a family member or friend prior to 2003, and terminated that work (index work experience, or IWE) during the year prior to September 2003. Work episodes ranged from one to 31 quarters.
Principle Findings: 1. About 85% of the sample were women, about 60% were non-White, and the average age was 48 years. 2. Most respondents, stayers and leavers, reported that they chose to provide care because the relative or friend "needed me." 3. Stayers were less educated, with larger households and lower household incomes. They had better health than leavers. 4. Stayers cared for more distant relatives, did not live in, and reported more choice about caring. 5. Prior to the IWE, more stayers had worked as caregivers. 6. Based on multivariate analyses, stayers were more likely to agree that "the job fit my interests" but that "the job did not let me use my skills." Counter-intuitively, stayers were less likely to agree that the work gave them a sense of accomplishment and to agree that they were "satisfied with my pay." 7. Among leavers, almost 60% report that they would probably or definitely be a caregiver

again for family, and about 43% would care for non-family.
Conclusions: Most former related workers do not continue with jobs in caregiving; only about one in ten are stayers. The growing number of programs like IHSS that pay family members and friends to provide home-based services attract many people who had not considered home care as a career option. While most make other career choices following their IHSS experience, some stay in the field and many others are sympathetic to home care as an employment option. But without information about home care employment options, they are less apt to seek jobs in the field.
Implications for Policy, Practice or Delivery: State and local programs should consider more actively marketing home care employment options to people who have previously cared for family and friends. A pool of potential workers is available but requires public outreach to provide specific information about available job opportunities. Such follow-up is needed to recruit more former workers into homecare careers.
Funding Source: RWJF, Atlantic Philanthropies

- Nursing Home Staffing & Quality of Care: An Analysis of Causal Pathways

Jeongyoung Park, M.P.H., Sally C. Stearns, Ph.D.

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Research Objective: Most previous literature has found that higher nursing home staffing leads to higher quality of care. However, existing estimates of the effect of staffing on quality may be biased because the relationship between staffing and quality of care has been identified by cross-sectional variation, and the potential endogeneity of staffing has not been fully controlled for. The purpose of this study is to assess whether changes in total staffing hours lead to changes in quality of care while controlling for the potential endogeneity of staffing.
Study Design: A facility-level fixed effects with instrumental variables approach was employed to test for and correct for the potential endogeneity of staffing. Staffing was constructed by total nursing staff hours per resident day. Resident outcome was measured by the incidence rate of pressure sores, while processes of care measures included the incidence rates of catheter use and restraint use. State minimum staffing standards, market-level nurse supply, and demand shifters were chosen as instruments to predict the staffing changes over time.
Population Studied: The data came from the Online Survey Certification and Reporting System (OSCAR) from 1998 through 2001. The OSCAR data were linked to data on market conditions and state staffing standards. A total of 55,248 facility-year observations from 15,217 non-hospital-based facilities were analyzed.
Principle Findings: When endogeneity of staffing is taken into account, the results show that increases in total staff hours significantly improved quality of care measured by the incidence rates of pressure sores and catheter use. In particular, the effects of staffing on quality of care are substantially larger than the estimates from non-instrumental variables approaches. A one unit increase in total staff hours per resident day led to a statistically significant decrease in the incidence rates of pressure sores and catheter use, by 1.5 percentage points ($p<0.01$) and 0.73 percentage points ($p<0.1$), respectively. These results were relative to an overall level of incidence rates of pressure sores of 3.45% and catheter use of 1.92%, respectively. The incidence rate of restraint use was not significantly associated with increases in total staff hours per resident day.
Conclusions: The findings provide support for the importance of total staff hours on nursing home quality and provide evidence that earlier models which did not control for the potential endogeneity of staffing may have underestimated the effect of staffing on quality of care.
Implications for Policy, Practice or Delivery: The lack of valid control for the potential endogeneity of staffing prevents determination of consistent estimates of the causal effect of staffing on quality of care and misleads policy implications. This study helps to resolve gaps in the previous literature and to understand the appropriate staffing levels to ensure quality of care. Furthermore, by linking state minimum staffing standards to identify exogenous variation in staffing, this study contributes to an improved understanding of the relationship between state minimum staffing standards, the level of staffing, and quality of care in nursing homes.

Management & Organization

Influence of Organizational Factors on Provider Behavior & Quality Improvement

Chair: Neil Jordan, Ph.D.

Sunday, June 3 • 5:00 p.m.-6:30 p.m.

▪ **Organizational Factors in Cardiac Rehabilitation (CR) Utilization by Medicare Beneficiaries**

Sarita Bhalotra, M.D., Ph.D., Deborah Gurewich, Ph.D., Donald Shepard, Ph.D., Jose Suaya, M.D., Ph.D., Jeffrey Prottas, Ph.D.

Presented By: Sarita Bhalotra, M.D., Ph.D. 415 South Street, Waltham, MA 02454, Phone: (781) 736-3960, Email: bhalotra@brandeis.edu

Research Objective: CR, a medically-supervised outpatient program, reduces morbidity and mortality in patients with established cardiac disease. Program components vary in intensity and include a monitored exercise program, risk factor identification, and nutritional counseling. However, despite many well-established benefits of CR, participation is very low. This is attributed to a range of factors including those at the provider-level (e.g. low physician referral rates), patient-level (e.g. perception of severity of illness), and system-level (e.g. distance and low geographic availability of CR programs). This study focuses on the role of organizational factors influencing utilization of CR, about which little is known.
Study Design: An analysis of national Medicare claims undertaken as part of the Brandeis evaluation of Medicare's Lifestyle Modification Program Demonstration (LMPD) demonstrates a national CR utilization rate of 12.2% among eligible Medicare beneficiaries (approximately 600,000), with variations by race/ethnicity, gender, and state. We used the claims-based analysis to first select four states at each extreme of utilization (high and low) and then two CR sites each within each state with high and low utilization for those States (for an expected n=32) to examine barriers to CR participation. The LMPD implementation evaluation had previously identified barriers to enrolment at the patient, provider, and organizational levels. We constructed a questionnaire based on findings from the implementation study of LMPD, and conducted telephone interviews to understand system and organizational factors that might explain observed variations in CR use.
Population Studied: 27 interviews were conducted with CR program managers. Interview findings were qualitatively coded into major themes. We build on Tichy's (1983) conceptualization of organizations as consisting of three interactive sub-systems (technical, political, and cultural) to frame our findings.
Principle Findings: Technical work processes were instrumental influences, e.g. standing discharge orders and protocols for CR, post-discharge follow-up to referring hospitals and/or patients. The political sub-system (represented by strong clinical championing) was influential; significantly, past political support was found to be critical in creating a cultural sub-system that supported CR even in the absence of current strong political support. Overall, the organizational culture or ideology around CR and belief in its clinical efficacy was found to be an important contributor.
Conclusions: We found that, as an out-patient, predominantly hospital-based program, CR functions as a micro-system whose degree of integration into the parent system's mission, strategic plan and operational systems influenced the utilization of CR (e.g., hospital-based physician leadership, institutionalization in the hospital's quality assurance system, conceptualization of this service as an intrinsic part of the overall mission, shared nursing staff for both in and out-patient components of CR, I.T. system support).
Implications for Policy, Practice or Delivery: Increasingly, policy makers and providers recognize the central role that organizations play in ensuring quality, especially when the care involves coordinating and facilitating access across multiple service settings, as is the case with C.R. Given the growing burden of chronic illness and the need for tertiary prevention, it is important to understand how organizational factors influence utilization of interventions such as CR. This exploratory study provides the basis for a systematic assessment to evaluate approaches and improve uptake of such interventions
Funding Source: CMS

▪ **The Effect of Physician Practice Organizational Form on Physician Behavior & Adoption of Health Information Technology**

Carol Simon, Ph.D., Lauren A. Smith, M.D., M.P.H., William White, Ph.D., Alyssa Pozniak, Ph.D., Andrew Johnson, M.A.

Presented By: Carol Simon, Ph.D., Principal Associate and Abt Fellow, Domestic Health, Abt Associates, 55 Wheeler Street, Cambridge, MA 02138, Phone: (617) 349-2635, Email: carol_simon@abtassoc.com

Research Objective: To measure the effect of physician practice organization on physician practice activities and treatments of key chronic diseases. We look at the role of practice characteristics in adopting health information technology (HIT) and the effect of HIT on activities and treatment decisions.
Study Design: While a growing body of literature addresses the impact of managed care, there is incomplete and fragmented information about how physicians relate to their practices, and, in turn, how practices relate to managed care organizations (MCOs). This study develops and fields a multi-mode survey linking physician behavior to characteristics of the physician, his/her practice and the managed care environment. Data domains include physician characteristics and income, practice revenues and structure (e.g., resources, payer type, use of information technology (electronic health records, decision support systems), pay for performance [P4P]), and administrative controls. Multivariate weighted regression and logistic regressions were used to analyze practice activities and treatment patterns, allowing HIT to be endogenous. Data are weighted to account for sampling design and known sources of non-response. Separate analyzes estimate the factors contributing to HIT adoption.
Population Studied: A random sample of 1200 primary care (PC) and pediatric physicians in 5 states (California, Illinois, Georgia, Pennsylvania and Texas). The sample was derived from the American Medical Association Physician Masterfile. Pediatric and minority physicians were over sampled.
Principle Findings: Preliminary results suggest that physicians are moving from solo/small to mid size practices. Minority physicians are more likely to be in solo and small practices. PC physicians in mid and larger size practices work more hours and see more patients/week compared to PC physicians in smaller practices. PC physicians in larger practices and practices with higher revenues report using electronic health records more frequently than PC physicians in smaller practices and those with fewer financial resources. Minority physicians report lower HIT adoption and use than non-minority physicians, controlling for practice size. Preliminary analyses also suggest that facility practice size, managed care contract characteristics, HIT use, and physician demographics were related to PC physicians' propensity to follow recommended treatment guidelines for depression and asthma. Further analyses will separate the effects of endogenous HIT adoption and practice organizations.
Conclusions: The findings suggest that there are significant differences between various physician practice organizations in terms of clinical care (asthma, depression), use of HIT, and use of referrals. Furthermore, these differences are magnified between minority and white physicians.
Implications for Policy, Practice or Delivery: This research contributes to a better understanding of barriers to high quality ambulatory care and the role of HIT and practice resources. Differences in HIT adoption by minority physicians may be linked to differences in resources and managed care participation, and may affect patient care.
Funding Source: AHRQ, California Endowment, Commonwealth Fund

▪ Organizational and Environmental Factors Associated with Hospitalist Use

Mindy Wyttenbach-Lindsey, Ph.D., M.H.S.

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Research Objective: Hospitalists are physicians trained in general internal medicine that focus their practice on the care of hospitalized patients. Since 1996, health services researchers have probed potential benefits and drawbacks of hospitalists related to length of stay, mortality, costs, and satisfaction. The literature however, does not examine hospitalists as an organizational issue. The objectives of this study are to determine what organizational and environmental factors are associated with hospitalist use, to discover which of these characteristics are associated with increased hospitalist dependency by health care organizations, to test one set of hypotheses under three diverse hospitalist definitions to determine if hospitalist definitional variation may affect study findings, and to frame hospitalist use as a managerial innovation or an emerging medical specialty.

Study Design: The conceptual framework in this study originates from resource dependency theory and the management innovation literature. The data set combines variables from the American Hospital Association, Wisconsin Hospital Association, Society of Hospitalist Medicine, and the Centers for Medicare and Medicaid Services. The study uses a non-experimental, cross-sectional design as well as a lagged variable technique to minimize the temporal sequencing disadvantage of cross-sectional analyses. The study carries out a series of Tobit regression analyses to detect relationships between a set of 13 organizational and environmental variables and hospitalist use.
Population Studied: The organization, or individual hospital, is the unit of analysis in this study. The final dataset is composed of 1,352 hospitalists within 119 hospitals in the state of Wisconsin in 2002.
Principle Findings: While results of study hypothesis testing differ based on the chosen hospitalist definition, findings reveal consistently that Wisconsin hospitals in more concentrated markets and those in markets with more community based sub-specialists depend more on hospitalists. The relationship between MSA size, case mix, occupancy, and hospitalist use varied based on the chosen hospitalist definition.
Conclusions: This study serves as a preliminary step to exploring hospitalist use at the organizational-level. While findings provided marginal support for the study's conceptual model, results did not sustain the assertions that hospitalist use is a managerial innovation or that it is a new medical specialty. After a decade into the hospitalist movement in the United States, the literature on the topic continues to expand and this continues to be a fruitful area for patient-level, physician-level, and organizational-level research. Learning more about why organizations turn to hospitalist use to varying degrees will be instrumental for organizational decision makers who are considering the adoption of this strategy in the future.
Implications for Policy, Practice or Delivery: This is the first research on hospitalists to incorporate organizational theory to explain the propensity for the adoption the hospitalist model of inpatient care. Two aspects of the study's methodology have broad implications for health services research. First, the use of Medicare claims data to differentiate hospitalists from traditional internists at the organizational level is unique to this study. This technique could be replicated for individual organizations, states, regions, or even on a national level. Second, this study is the first to consider a diverse set of hospitalist definitions in a single analysis. In terms of the managerial implications, findings indicate that the diversity of existing hospitalist definitions in the literature poses major challenges for administrators who are interested in adopting a hospitalist model of care. For administrators considering the adoption of a hospitalist model or hoping to grow an existing program, they must understand how to define hospitalists uniformly. Without this standardization, organizations will likely have difficulty attracting the best-qualified inpatient providers to assume the management of the hospital's inpatient population. For professional associations that advocate hospitalist medicine becoming a distinct specialty, the lack of a uniform hospitalist definition poses a seemingly insurmountable challenge for specialization to occur. From a physician-training perspective, as academic centers work to create new residency and fellowship tracks for hospitalists, they must define at the root of these programs, what it means to be a hospitalist. Without this descriptive uniformity, sustaining and growing a hospital-based hospitalist program could be difficult for hospitals in the long-term.

- Patient Assessment of Chronic Illness Care in Various Organizational Models of Primary Health Care: Preliminary Results

Jean-Frederic Levesque, M.D., Ph.D., Debbie Feldman, Ph.D., Caroline Dufresne, M.Sc.

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Research Objective: Many highly developed countries are implementing reforms of their primary health care (PHC) systems. These reforms often aim at better integrating care for ageing populations with chronic illnesses. Various PHC models have been proposed. Although these models have shown encouraging results for the care of general population, their impact on chronic illness care has been less studied. This study aims to measure patients' assessment of chronic illness care and its variation across PHC models.
Study Design: Face-to-face interviews were conducted by professionally trained interviewers using validated questionnaires (SF-36; Patient

Assessment of Chronic Illness Care - PACIC). Linear regression models assessed the association of PHC models with PACIC scores, controlling for age, sex, self-rated health and chronic illness status.
Population Studied: Patients with one of four chronic diseases (diabetes, heart failure, arthritis, chronic obstructive pulmonary disease) from participating PHC clinics from Montreal, Canada and its surroundings were contacted between June and October 2006.
Principle Findings: We present results from the first 245 patients participating from 14 PHC organizations. Mean age of participants was 69 years and 54% were females. As principal source of care for their chronic illness, 13% identified a community health centre (CHC), 20% a family medicine group (FMG), 7% a solo physician, 36% a medical polyclinic, and 25% a specialist physician. Among all patients, 73% were never encouraged to participate in a group or course; 69% were never given a copy of their treatment plan; 62% were never contacted after a visit; 61% were never given a list of things to do to improve their health; and 50% were never questioned about their health habits. Average PACIC score was of 2.5 (maximum of 5), varying from 2.2 for patients with heart failure up to 2.8 for diabetics. Assessment of chronic illness care was higher on average among patients affiliated to a FMG (2.8), solo private practitioners (2.7) and medical polyclinics compared to those affiliated to local CHC (2.0) or to a specialist (2.3). In multiple models (R square = 0.16), lower assessment of chronic illness care was associated with affiliation to a CHC, suffering from heart failure and being older, controlling for other factors.
Conclusions: Our study reports moderate levels of achievement in chronic illness care, many interventions being offered or provided to a minority of patients. Patients affiliated to a CHC report lower levels of care for their chronic illness. This is surprising given the multidisciplinary nature of CHCs and their focus on health promotion and prevention activities. This raises questions about the ways with which curative care is handled in this setting compared to more clinically oriented PHC organizations. However, study population could vary with regards to socioeconomic status or other social characteristics influencing affiliation to PHC organizations.
Implications for Policy, Practice or Delivery: Assessment by patients followed in PHC and specialist settings suggest that improvements are required in many spheres of chronic illness care. Variations across PHC models could have implications for improving management of chronic illness.
Funding Source: Canadian Institute for Health Research

▪ Are Teaching Hospitals Even Better than We Think?

Amol Navathe, M.D./Ph.D. candidate, Jeffrey H. Silber, M.D., Ph.D., Paul Rosenbaum, Ph.D., Yanli Wang, M.S., Kevin G. Volpp, M.D., Ph.D.

Presented By: Amol Navathe, M.D./Ph.D. candidate, School of Medicine and The Wharton School, University of Pennsylvania, 3641 Locust Walk, Colonial Penn Center, Room G7, Philadelphia, PA 19104, Phone: (267) 975-8833, Email: amol@med.upenn.edu

Research Objective: The objective of this study is to refine our understanding of the relationship between teaching status and quality of care. Previous research has found better outcomes in geographically limited samples of teaching hospitals, but treated all hospitals with resident-to-bed ratios greater than 0.25 identically, lumping together large quarternary care centers with relatively small teaching hospitals. This methodology may lead to significant understatement of the degree of difference in outcomes between highly teaching-intensive hospitals and non-teaching hospitals. We examine how quality of care varies with a continuous measure of teaching intensity, use the nationwide population of Medicare patients, and test whether the relationship changes over time.
Study Design: We examined how 30-day all cause mortality varied by intern-and-resident-to-bed ratio, IRB, for patients admitted for a principal diagnosis of Acute Myocardial Infarction, AMI. We controlled for patient severity using Elixhauser comorbidities including a six-month look back to enrich risk-adjustment. We chose AMI because, as an emergent condition, patient selection is less likely to be a confounding factor than other conditions. Standard errors were clustered by hospital to account for within-hospital correlation. We calculated a patient risk model by employing 1996 data external to the sample to predict odds of death.
Population Studied: Our analysis studied outcomes in the nationwide population of 1,431,578 Medicare patients from 5273 hospitals during the period 1997 to 2003. For patients with multiple admissions in the sample, one admission was randomly selected for inclusion.

Principle Findings: Relative odds of mortality decreased with teaching intensity with a p-value less than 0.001 even after inclusion of categorical variables for minor and major teaching hospitals. A Level III major teaching hospital, IRB=1, has relative odds of mortality of 0.67 compared to a non-teaching hospital, IRB=0. For a Level II major teaching hospital, IRB=0.6, the relative odds are 0.78; Level I major teaching, IRB=0.25, relative odds are 0.90; and minor teaching, IRB=0.1, relative odds are 0.96. These results correspond to a 33.4 percent reduction in odds of mortality between non-teaching and Level III major teaching, a 9.7 percent reduction between non-teaching and minor teaching, and a 26.5 percent reduction between minor teaching and Level III major teaching. The results did not vary significantly over the years 1997 to 2003.
Conclusions: Using comprehensive Medicare data and a refined approach to teaching intensity we find that hospitals with greater teaching intensity had significantly lower mortality for AMI patients than hospitals of moderate teaching intensity. This difference was consistent across all years of our sample indicating that, during a period in which mortality for AMI decreased by 2.4 percentage points, non-teaching hospitals improved at similar rates to teaching hospitals. Forthcoming results describing the interaction between patient severity and teaching intensity will characterize which patients realize the most benefit from admission to a teaching-intensive hospital.
Implications for Policy, Practice or Delivery: These results suggest that teaching intensity is a powerful marker of higher quality of care. Patients can use this marker in choosing hospitals and the relationship further suggests that practices adopted by teaching-intensive hospitals might be used to improve quality of care in less teaching-intensive institutions.
Funding Source: National Heart, Lung, and Blood Institute

Organizational/Management Practice & Policy: Costs & Quality

Chair: Dave Knutson

Monday, June 4 • 4:30 p.m.-6:00 p.m.

▪ Do Referral Patterns Differ When Physicians Own the Hospital? Evidence from Texas

Su Liu, Ph.D., Cheryl Fahlman, Ph.D., Deborah Chollet, Ph.D.

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Research Objective: The recent proliferation of specialty hospitals, or "niche hospitals" has caught great public attention. In particular, the extent to which patient mix systematically differs between niche and general hospitals and whether physician owners' financial incentive drives such differences remain controversial. This study examined referral patterns of physician owners relative to those of non-owners by comparing their admissions to niche versus general hospitals in Texas between 2000 and 2004.
Study Design: We analyzed the Quarterly Texas Hospital Inpatient Discharge Public Use Data Files for 2000 through 2004. Niche hospitals were identified using criteria from the Texas state legislature and Center for Medicare and Medicaid Studies. Physician owners were identified from the hospital licensing applications. Bivariate statistics were developed to describe the number and characteristics (including the primary payer, the severity of illness, and the risk of mortality) of specialty-appropriate discharges. We compared these statistics and reported t-test results by physician (owners vs. non-owners) and by hospital (niche vs. general).
Population Studied: The analysis was based on discharge records associated with all identifiable physician owners and non-owners, all niche hospitals where specific physician owners were identified, and all general hospitals providing similar services. In 2004, we identified 15 niche hospitals (including one cardiac, seven orthopedic, and seven surgical hospitals); 148 physician owners and 154 non-owners admitted patients to these hospitals.
Principle Findings: Admissions by physician owners accounted for more than half of all discharges from physician-owned niche hospitals in 2004. In addition, the admitting patterns of physician owners differed significantly from those of non-owners with admitting privileges to physician-owned niche hospitals. In 2004, physician owners admitted 42 percent of specialty-appropriate cases to their own niche hospital, while non-owners admitted just 30 percent of such patients; the largest difference was observed among orthopedic hospital admissions. Admissions to physician-owned niche hospitals were more likely to be privately

insured and less likely to be self-pay/charity or Medicaid patients, or to be severely ill. These admitting patterns, by payer and severity of illness, were consistent across types of niche hospitals and also largely the same for owners and non-owners.
Conclusions: Financial incentives, including greater personal income and capital gains, as well as "amenities" such as convenience in scheduling, may drive significantly higher rates of self-referral to physician-owned niche hospitals in Texas. However, other factors that may affect admitting patterns—including insurance networks and patient preferences—are unlikely to differ so systematically between owners and non-owners as to drive the significant differences in observed referral patterns.
Implications for Policy, Practice or Delivery: While physician owners were significantly more likely to admit patients to their own facilities, admission patterns of non-owners also were biased toward admitting privately insured and low-severity patients to niche hospitals. In turn, biased referral to general hospitals clearly adds to the challenge that relatively high rates of Medicaid and self-pay admissions present, as well as a heavier load of high-severity patients. The difficulties we faced in identifying niche hospitals, owners, and referring physicians suggest that states need improved records systems to understand and monitor the effects of biased referral as niche hospitals continue to develop.
Funding Source: Texas Department of State Health Services

- Relationship Between the Use of Clinical Practice Guidelines and Length of Stay: A Systematic Review

Moriah Ellen, M.B.A., Ph.D., Adalsteinn Brown, Ph.D., Peggy Leatt, Ph.D.

Presented By: Moriah Ellen, M.B.A., Ph.D., Health Policy, Management, and Evaluation, University of Toronto, 57 Glen Park Avenue, Toronto, M6B 2C1, Canada, Phone: (416) 256-4450, Email: moriah.ellen@gmail.com

Research Objective: To describe the relationship between CPG usage and LOS and to describe the state of the literature on this relationship e.g. study quality, methodologies, and clinical focus.
Study Design: This research utilized a systematic review design. Seven electronic databases were searched for all available years up until the third week of March, 2004. The grey literature was explored thoroughly. Hand searches of relevant journals and bibliographies were performed. Inclusion/ exclusion criteria, data abstraction forms and a quality rating tool were developed. Data were abstracted and analyzed based on templates that were adapted from a review of data abstraction forms (West et al., 2002). (West, S., King, V., Carey, T., Lohr, K., McKoy, N., Sutton, S. et al. (2002). Systems to Rate the Strength of Scientific Evidence (Rep. No. 47). Agency for Healthcare Research and Quality.)
Population Studied: All available research studies conducted in acute care hospitals on inpatient populations
Principle Findings: The number of potentially relevant articles obtained was 1,943 and the final number of articles selected for review was 173. No publication bias was discovered in the funnel plots. 155 studies (89.5%) analyzed one CPG and 18 (10.5%) of them analyzed two or more CPGs. Nine studies were RCTs, three studies were case controls, and 161 were cohort studies that used either historical or concurrent controls. 157 (91%) studies utilized one hospital for their research, and 16 (9%) studies used 2 or more hospitals. 79% of the studies were conducted in the U.S., 6% in Canada, and the remainder in other countries. The average quality rating was 15.24 out of 28 and the breakdown for the different quality components are discussed in the report. The study designs and quality rating were fairly consistent over the past 15 years. Two sign tests were conducted between CPG usage and hospital LOS: one on the reduction in LOS days and one on the percentage change. Both tests demonstrated a statistically significant difference from zero ($P<.0001$) meaning CPGs are associated with a reduction in LOS. No correlation exists between percentage change in LOS and the quality rating.
Conclusions: All the evidence abstracted from the articles suggests that CPG usage reduces LOS. The reduction in LOS was not consistent across all studies and varied based on characteristics other than study quality. However, there are reasons why this conclusion should be approached cautiously, particularly because of poor study quality and limited study populations.
Implications for Policy, Practice or Delivery: This research suggests that CPG usage leads to reduced LOS, thus increasing efficiency and may also include other quality benefits. Healthcare systems benefit from CPGs in that they may improve efficiency and thus reduce the required

amount of resources to produce the necessary output (Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999). Policymakers and administrators continuously struggle with the need to contain costs in health care as a whole but more specifically in hospitals. This research sheds some light on one tool i.e. CPGs, deemed potentially beneficial to improve efficiency by reducing LOS. Future research should study the effect of CPGs across a large number of institutions or across more than one clinical area. (Woolf, S. H., Grol, R., Hutchinson, A., Eccles, M., & Grimshaw, J. (1999). Potential Benefits, Limitations, and Harms of Clinical Guidelines. British Medical Journal, 318, 527-530.)
Funding Source: Canadian Institutes for Health Research: Doctoral Research Award

- Short-Term Variability in Nurse to Patient Ratios: Causes & Implications

Kathleen Fuda, Ph.D., Brad Prenney, M.S., M.P.A., Carol Conley, R.N., M.S., Eugene Litvak, Ph.D.

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Research Objective: The nurse to patient ratio is thought to affect quality of patient care in hospitals. Also, efforts to mandate increased nurse staffing in hospitals frequently focus on this ratio. However, discussion of these issues typically treats the nurse to patient ratio as static, equivalent to the average or budgeted ratio. Short-term variability in this ratio is poorly recognized, but may underlie much of the stress floor nurses experience. This study aims to document short-term variability in the nurse to patient ratio and to examine its causes.
Study Design: This is a preliminary study done in preparation for a RWJF-funded study of variability in patient census, its causes, and its impact on nurse to patient ratios and nursing time spent on direct patient care. It involves a secondary analysis of data provided for several studies of variability in patient flow at individual hospitals. We examined the number of patients assigned to individual inpatient units for each date and shift, as well as the number of nursing staff assigned to each unit during the same periods. The average number of patients assigned to each nurse was then calculated for each period. The range of these ratios was calculated, and they were correlated with variability in both patient census and absolute staffing levels. The impact of unit occupancy rate on these ratios was explored, as well as the ability of hospitals to flex staffing levels to match changes in patient census.
Population Studied: Three community hospitals engaged in broader studies of patient flow provided the data.
Principle Findings: The average number of patients assigned to individual nurses on a given hospital unit and shift can vary widely (by a factor of two) from day to day, even when weekends and holidays are excluded from the analysis. This was true for a variety of types of units, including intensive care units, telemetry units, and medical/surgical units. Variability in both patient census and staffing levels contribute to short-term change in this ratio, but patient census is more strongly correlated with the ratio in units where census frequently drops below 100% occupancy.
Conclusions: Variability in the nurse to patient ratio is substantial in scale and occurs in a wide range of types of hospital units. Most frequently, short-term fluctuations in patient census drive variability in the ratio.
Implications for Policy, Practice or Delivery: Variability in patient census and its role in short-term fluctuations in the nurse to patient ratio on hospital units is under-recognized. Given previous research linking nurse to patient ratios and patient outcomes, these findings raise troubling questions about the impact of variability in patient census on quality of care in hospitals. Furthermore, debates about legislated nurse to patient ratios typically do not recognize their high levels of variability over the short term, nor the fact that actual ratios infrequently match the "budgeted" or "target" ratios for given units. Reducing variability in patient census levels by smoothing of elective admissions represents an alternative solution to mandated ratios.

- Cost Inefficiency and Hospital Health Outcomes

Niccie McKay, Ph.D., Mary E. Deily, Ph.D.

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Research Objective: Quality improvement and cost containment in hospitals are central

objectives of current health policy, with a continuing policy concern being that efforts to control costs could lead to worsened health outcomes. However, total costs have two components—costs that reflect the efficient use of resources ("good" costs) and costs associated with waste or inefficiency ("bad" costs). While even the most efficient and productive hospital must incur a certain level of cost to operate effectively and safely, studies indicate that hospitals typically also have some costs that are due to waste or poor decision-making. The major objective of this study is to examine the relationship between patient health outcomes and costs due to inefficiency in hospitals.
Study Design: The empirical analysis examines health outcomes as a function of cost inefficiency and other determinants of outcomes, with outcomes being measured by mortality and complication rates. The independent variable of primary interest, cost inefficiency, is measured using the stochastic frontier approach, which includes two error terms—one to measure random error and one to measure inefficiency. Due to the possible endogeneity of input prices and outputs when estimating a cost function, the outcomes regressions use two separate sets of cost inefficiency scores—one using baseline values and the other using instrumental variables.
Population Studied: Data for the study come from: the Centers for Medicare and Medicaid (CMS), the American Hospital Association (AHA) Annual Survey, the Area Resource File (ARF), and Solucient, a private healthcare information company, which supplied information on observed mortality and complications rates and on risk-adjusted expected mortality and complications rates. The sample includes acute-care hospitals in the U.S. over the period 1999-2001. The final dataset contains 3,384 observations in 1999, 3,343 observations in 2000, and 3,183 observations in 2001, for a total of 9,910 across the three years.
Principle Findings: The results showed no systematic pattern of association between cost inefficiency and hospital health outcomes, as measured by mortality and complications rates; the basic results were unchanged regardless of whether cost inefficiency was measured with or without using instrumental variables. The analysis also indicated, however, that the association between cost inefficiency and health outcomes may vary substantially across geographical regions.
Conclusions: The results highlight the importance of distinguishing between "good" costs that reflect the efficient use of resources and "bad" costs that stem from waste and other forms of inefficiency. That is, if good costs are reduced enough, at some point poorer health outcomes must result. In this study, however, there was no association between bad costs and health outcomes.
Implications for Policy, Practice or Delivery: A key policy implication of this study is that hospital programs to reduce cost inefficiency are unlikely to be associated with worsened health outcomes. On the other hand, across-the-board reductions in cost could well have adverse consequences on health outcomes, because a certain level of costs is necessary for hospitals to provide safe, effective, high-quality care.
Funding Source: Lehigh University Martindale Center

- **The Relationship Between Line Authority for Nurse Staffing & Patient Care Cost**

Chuan-Fen Liu, Ph.D., M.P.H., Yu-Fang Li, Ph.D., R.N., Elliott Lowy, Ph.D., Nancy Sharp, Ph.D., Anne Sales, Ph.D., R.N.

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Research Objective: The Department of Veterans Affairs (VA), a federal agency of the United States government, has implemented extensive organizational changes to improve efficiency of inpatient care since the mid-1990s. One reorganization strategy, implemented during the period 1996-2000, was the use of interdisciplinary patient care teams within service line structures, which in turn affected nursing supervision and reporting structures. Although Service Lines were intended to provide more efficient and economical patient care, shifting control of nurse staffing decisions to an interdisciplinary service line also had the potential to decrease efficiency by creating new barriers to cross-service planning for staffing and to reassignment of nursing staff from low to high census areas. This study examines the relationship between nurse executive line authority for nursing staff and patient care costs between 02/2003 and 06/2003 at 124 acute care VA hospitals.
Study Design: The unit of analysis is the hospital. We assessed nurse executive line authority for nurse staffing based on information

from the VA Office of Nursing Services and a survey of nurse executives. Other data sources were VA Decision Support System inpatient extracts (patient care costs and nurse staffing), administrative databases (patient characteristics and health outcomes); and national databases (market/health service area characteristics). The dependent variable was the total patient care cost per bed day of care for each hospital.
Population Studied: We extracted patient care costs for 124 acute care VA hospitals.
Principle Findings: Among 125 hospitals, 87 had Nurse Executive line authority for nurse staffing in 2003. Compared to hospitals without Nurse Executive line authority for nurse staffing, these 87 hospitals had lower patient care costs per bed day of care ($258 versus $283, p=0.058), fewer registered nurse hours per patient day (4.2 hours versus 4.7 hours, p=0.083), and fewer total nursing hours per patient day (7.2 hours versus 7.9 hours, p=0.033). After controlling for nurse staffing and patient, facility, and market area characteristics, the relationship between patient care cost and line authority for nurse staffing was not statistically significant. The factors significantly associated with high patient care costs were higher nurse staffing levels (RN and non-RN hours) and the RN wage index, comparing costs of nursing wages across different markets.
Conclusions: Our study results provide no evidence that moving to a service line organizational structure offers cost efficiency, nor evidence that there are inefficiencies associated with this organizational change.
Implications for Policy, Practice or Delivery: Understanding the relationship between the line authority of Nurse Executives and total patient care cost will assist in making organizational decisions about appropriate line of authority in inpatient settings.
Funding Source: VA

Organizational Culture, Climate & Readiness to Change

Chair: Gary Young,

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

▪ The Influence of Primary Care Practice Climate on Patient Trust in Physician and Activation

Edmund Becker, Ph.D., Douglas Roblin, Ph.D.

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Research Objective: Organizational antecedents of patient trust in physician and the relationship of physician trust to healthy behaviors have seldom been studied in primary care practices. In other service industries, teamwork among employees in self-managing teams has been associated with customer orientation, satisfaction, and trust. Patient trust in physicians is an important determinant of treatment adherence, patient retention, and satisfaction – factors that, in turn may activate patients in health behaviors. We studied the relationships of: 1) primary care practice climate with trust in primary care physician (TIPCP) of patients receiving care from primary care teams, 2) TIPCP with patient activation, and 3) patient activation with exercise frequency and dietary intake.
Study Design: Practice climate was assessed from responses to written surveys administered to this MCO's 16 primary care teams in 2004. Practice climate is a multidimensional construct consisting of 7-subscales (e.g. task delegation, role collaboration, patient orientation, team orientation). It is measured at the team-level as the average of the team's practitioners and support staff responses. A mixed mode survey was administered in 2005 to 25-59 year old MCO enrollees employed by large public and private employers in the Atlanta area. Enrollees (N=5,309) were randomly sampled from 3 cohorts defined from MCO databases: diabetes, elevated lipids without CAD, and "low risk". The survey included items for trust in physician (PCAS), activation (PAM-13), exercise (BRFSS), height and weight (for computing BMI), and dietary intake (Block). TIPCP was estimated as a function of practice climate using fixed effects hierarchical linear regression of patient nested within team. Activation was estimated as a function of TIPCP, using linear regression. Exercise frequency and dietary intake measures were estimated as a function of activation using logistic and linear regression. All regressions included covariates for patient characteristics.
Population Studied: 83 practitioners and 158 support staff (90% response rate) of the 16 primary care teams. 2,224 respondents (42% response rate): 652 with diabetes, 792 with elevated lipids, 780 low risk
Principle Findings: Adjusted for patient covariates, TIPCP was significantly (p=0.05),

positively associated with primary care team practice climate. Adults with high TIPCP were significantly more likely to attribute influence of their primary care teams on their exercise and diet, report receipt of advice on exercise and diet, and express satisfaction with facets of interactions with their primary care practitioners (all $p<0.05$). Patient activation was significantly, positively associated with TIPCP; and, in turn, exercise frequency and dietary intake were significantly, positively associated with patient activation (all $p<0.05$).

Conclusions: Primary care practices where practitioners and support staff perceived more favorable team orientation, role collaboration, task delegation, and patient orientation had patients with greater TIPCP. The influence of TIPCP on patients' health and their practice of healthy behaviors appears to be mediated through the influence of TIPCP on patient activation.

Implications for Policy, Practice or Delivery: Our model suggests that the collaboration and teamwork among practitioners and support staff in primary care teams is one factor ultimately contributing to patient health. National efforts to improve patient outcomes will benefit from a better understanding of how system factors, as well as patient factors, contribute to better population health.

Funding Source: CDC

- **Nurses' Perceptions of Staffing & Resource Adequacy: Does Job Design Make a Difference?**

Kamisha Escoto, Ph.D., Ben-Tzion Karsh, Ph.D., Theresa Shalaby, R.N., Matt Scanlon, M.D., Neal Patel, M.D., Kathleen Murkowski

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Research Objective: The provision of quality nursing care is critically dependent on appropriate nurse staffing levels and skill mix. The relationship between nurse staffing ratios and adverse events and patient mortality has been well documented. Additionally, nurses' perceptions of insufficient staffing and availability of resources is persistent in the literature. Such perceptions influence nurses' beliefs in their ability to provide quality care, which may lead to dissatisfaction, stress, and other decrements in quality of work life. Little research has explored factors contributing to nurses' perceptions of adequate staff and resources, beyond intuitive factors such as patient acuity and skill mix. There has been indication, however, that characteristics of the nurses' job and practice environment are contributing factors. We examined the relationship between nurses' perceived aspects of their job and their perceptions of the adequacy of staffing and resources on the unit.

Study Design: The study was conducted at an academic pediatric hospital in the Midwestern United States. We developed and distributed an employee survey consisting of job design and employee outcome variables to staff nurses November – December 2005.

The job design variables used in this analysis were time pressure, task control, resource control, skill discretion (creativity), feedback, role conflict, role ambiguity, colleague support, supervisory support, and nurse-physician relations. All items were based on established scales in the literature.

Population Studied: Pediatric staff nurses working on three patient care units: Pediatric Intensive Care (PICU), Medical-Surgical (MedSurg), and Hematology-Oncology-Transplant (HemOT).

Principle Findings: The response rate was 59.1% (n=120 nurses). Overall, nurses rated the adequacy of staff and resources on their units slightly above average (moderate level), though over 20% had ratings on the lower half of the scale. Nurses differed significantly in their perceptions of the adequacy of staff and resources on the unit, with PICU nurses having the highest ratings and HemOT nurses the lowest. All job design variables significantly correlated ($p < .05$) with nurses' perceptions of staffing and resource adequacy. Stepwise regression analysis indicated that after adjustment for unit, 51% of the variance in staff/resource adequacy was explained by a combination of four job design variables: low levels of time pressure ($B = -0.435$, $p<0.001$), positive, collegial relations with physicians ($B = 0.339$, $p<0.001$), extent of creativity in the job ($B = 0.245$, $p<0.001$), and high levels of feedback ($B = 0.205$, $p=0.002$).

Conclusions: Nurses' perceptions of specific characteristics of their job are related to the extent they feel their unit is adequately staffed and has resources available for patient care. Further investigation into these aspects of the nursing job is necessary to understand the exact mechanisms.

Implications for Policy, Practice or Delivery: Adequate staff and resources are a critical component of a work environment that is conducive for the delivery of quality patient care. Designing and implementing interventions that, for example, enhance working relationships and provide real-time feedback may increase nurses' confidence that their unit is adequately staffed. This carries an implication of improving nurse quality of work life, in addition to the potential benefit to patient care. These findings suggest that redesigning nursing work should be considered alongside efforts to determine optimal nurse staffing ratios.
Funding Source: AHRQ

- The Social Construction of Valuation: Playing Mind Games

Colleen Rye

Presented By: Colleen Rye, Doctoral Candidate, Health Care Systems, Wharton, 3641 Locust Walk, Philadelphia, PA 19104, Phone: (610) 529.2817, Email: ryec@wharton.upenn.edu

Research Objective: Appropriate resource allocation amongst discovery and preclinical development programs is central to corporate strategy in pharmaceutical and biotechnology firms as well as social welfare. Yet resource allocation in Discovery and preclinical development is highly complex and, additionally, is frought with extreme technological, market, and regulatory uncertainty and risk. While we have many prescriptions for how managers should decide between investments, we know very little about how pharmaceutical and biotechnology companies actually allocate resources. Accordingly, this paper draws on longitudinal field research in the pharmaceutical and biotechnology industries to build a process model of how managers incorporate investment frameworks into the resource allocation process.
Study Design: Combining iterative cycles of inductive and deductive analysis, I used field methods to build theory that would elucidate the longitudinal processes of resource allocation in organizations. To do this, I combined complementary design and analytic elements from several field methods, including organizational biography (Kimberly 1987), process research (Pettigrew 1992; Van de Ven and Poole 2000), and grounded theory (Glaser and Strauss 1967). During two waves of data collection, I reviewed public and private archival data and conducted semi-structured on-site interviews with 33 executives in 15 companies.
Population Studied: Informants included the spectrum of employees in pharmaceutical and biotechnology firms, including bench scientists, front-line R&D and commercial managers, senior R&D and commercial executives, and top managers in a range of companies, including large top twenty pharmaceutical and biotechnology companies as well as smaller firms.
Principle Findings: I find that investment frameworks such as net present value, Monte Carlo simulations, and real options analyses produce some of many objective criteria used to allocate resources in pharmaceutical and biotechnology research. However, I also find that actors' interpretations of organizational interests diverge within the organization across several types of boundaries, creating conflict in both the institutional norms guiding financial analysis and the preferences regarding technological choices. The process model reveals a set of behaviors in the informal organization – "playing mind games" – employed by executives to gain social influence over decisions made in the formal organizational resource allocation process. By playing mind games, executives are able to influence the valuation of technological opportunities and, in the process, change opportunity framing in the organization to be consistent with their interpretations of organizational interests. I find from the interview data that these mind games lead to adaptive outcomes for organizations, a conclusion that is also supported by public archival data.
Conclusions: Based on the model, financial valuation and prioritization are part of a socially constructed process, elucidating important process elements in economic theory. Additionally, the resource allocation process becomes less about moving projects through stages in a managerial hierarchy and more about the sociological structure of the organization and social influence strategies used within that structure, a contrast with previous theory in resource allocation (e.g. Bower 1970; Gilbert and Bower 2005).
Implications for Policy, Practice or Delivery: Companies should reconsider organizational structures to better leverage social influence processes occuring in the informal organization.
Funding Source: Mack Technology Center

- Strategies for Enhancing Organizational Learning in Healthcare Organizations

Peter Carswell, B.Sc., M.Com., Ph.D.

Presented By: Peter Carswell, B.Sc., M.Com., PhD, Senior Lecturer, Health Management, School of Population Health, University of Auckland, Private Bag 92019, Auckland, New Zealand, Phone: 00649 3737599, Email: p.carswell@auckland.ac.nz

Research Objective: The objective of this study was to determine the strategies that are important for organisational learning to occur in a healthcare organization. Organizational learning is a process through which knowledge is created, shared, and transferred amongst organizational members. The new knowledge can lead to improved organizational efficiency and effectiveness. Healthcare organizations are increasingly looking at how organizational learning principles can aid in improving quality service delivery, and improve organizational efficiency. However, there is very little empirical research to guide managers and policy makers on the sorts of strategies that may help in enhancing organizational learning in a healthcare context of professionals with markedly different perspectives.
Study Design: The research used a cognitive mapping methodology. This approach was made up of a number of phases. Initially fourteen focus groups were conducted, with individuals from all services and professional groups represented. The focus groups were used to generate statements regarding learning behaviours and strategies perceived and experienced. These statements were used to develop an 80-item survey instrument sent to all 4,680 employees. The survey measured how typically the learning behaviours and strategies were experienced, and how beneficial they were perceived to be for learning. These were measured on a likert scale with 1 being not al all beneficial/typical and 5 being completely beneficial/typical
Population Studied: Waitemata District Health Board (WDHB) in New Zealand was chosen as the population for addressing the research objective. District Health Boards are responsible for administering the entire public healthcare in the region they cover and WDHB is the second largest in New Zealand. At the time of this study it employed 4680 staff across five services in which it is structured.
Principle Findings: Results show there are specific strategies that the study participants deem important in aiding organisational learning. All of the strategies were experienced significantly less ($p<.01$) than was deemed to be beneficial for learning. The results in parenthesis are the mean scores for how beneficial (B) the strategy is perceived for learning, and how typically (T) it is experienced. The strategies are: being able to engage in reflective learning (B: $\mu=4.15$; T: $\mu=4.07$); developing a group environment that supports and encourages learning (B: $\mu=4.08$; T: $\mu=3.40$); engaging in formal training (B: $\mu=4.06$; T: $\mu=3.39$); and receiving adequate and timely feedback (B: $\mu=4.05$; T: $\mu=2.84$).
Conclusions: These results show that respondents experience the respective organisational learning strategies at levels typically lower than they deem as beneficial for learning. Many of these strategies relate to a need for connections between individuals, groups, and organisational units. Connection in the reflective learning behaviour is made apparent as the individual reflects upon their work and the environment such work is conducted. In the group environment factor this connection appears in perceiving a sense or being supported and valued by the organisation. Engaging in formal training reminds individuals that they are connected to a wider organisation, and provides an opportunity for individuals to connect with others they might not necessarily meet in their normal work. Finally, performance feedback helps renew the connection of the individual to the organisation by affirming they are doing the right thing, and providing motivation to continue.
Implications for Policy, Practice or Delivery: Management implications are that structural arrangements need to be changed to enhance the connection. These changes are a move to flatter hierarchies, increasing use of team work structures, providing incentives for learning, and enhancing information and communication networks.

- **Hospital Safety Culture: Relationship to Organizational Characteristics**

Laurence Baker, Ph.D., Sara Singer, M.B.A., David Gaba, M.D., Alyson Falwell, M.P.H., Tobias Rathgeb, B.A., Shoutzu Lin, M.S.

Presented By: Laurence Baker, Ph.D., Associate Professor, Health Research and Policy, Stanford University, 117 Encina Commons, Stanford, CA 94305, Phone: (650) 723-4098, Fax: (650) 723-1919, Email: laurence.baker@stanford.edu

Research Objective: A culture that emphasizes safety is widely presumed to be a key to improving patient safety in hospitals. Understanding how safety culture varies across institutions would provide valuable guidance to

efforts to improve safety by addressing culture. Yet, little is known about how safety culture is related to hospital characteristics. This study explores these relationships, focusing in two areas. First, the "organizational culture" of a hospital captures broad dimensions of the characteristics of an institution, such as how hierarchical or how entrepreneurial it is. One might imagine, and previous literature hints, that organizational and safety culture will be linked, but no research substantiates a relationship. Second, previous research leads to the hypothesis that less complexity and better communication—characteristic of smaller institutions—should be associated with safety culture, but this hypothesis has also not been tested formally.
Study Design: We performed a cross-sectional comparison of the relationship between measures of safety culture and hospital characteristics including measures of size and organizational culture. Data come from a survey of hospital personnel implemented at 92 hospitals in 2004 (response rate=51%). The survey provides measures of safety culture from the Patient Safety Climate in Health Care Organizations (PSCHO) instrument. Organizational culture data were obtained based on work by Zammuto and Krakower. This instrument measures four dimensions of organizational culture using a competing values framework: group culture, development/entrepreneurial culture, hierarchical culture, and rational culture. Data on hospital size and other hospital characteristics including urban status, tax status, and teaching status came from the AHA annual survey. We used regression analysis to assess relationships between the measures of interest, controlling for a range of hospital and area characteristics.
Population Studied: A stratified random sample of 92 hospitals, representing all 4 regions of the U.S. and 3 size categories.
Principle Findings: Organizational culture and safety culture are statistically significantly related. Measures suggesting a strong group culture, which is based on values associated with teamwork, are positively associated with strong safety culture. However measurements that indicate an environment with a strong hierarchical culture, which is associated with norms for control and stability, are negatively correlated with safety culture measures. Likewise, environments with a strong rational culture, which values efficiency and productivity, also have a weaker safety culture. Size was related to safety culture in a curvilinear manner. Personnel in small and very large hospitals reported fewer problems with safety culture than did individuals in medium-large hospitals.
Conclusions: There is a relationship between organizational culture and safety culture; some types of organizational cultures are associated with stronger safety culture than others. Both small and large size can prove advantageous in achieving a strong safety culture. While this is a cross-sectional study and thus strong inferences about causality are difficult to make, we hope that this initial evidence will spur further investigation.
Implications for Policy, Practice or Delivery: Policies should seek to enhance teamwork, reduce bureaucracy, and prioritize safety over rationality and to help medium-sized hospitals to overcome challenges associated with communication and complexity.
Funding Source: AHRQ

Medicaid, SCHIP & State Health Initiatives

Medicaid Coverage, Policies & Performance

Chair: Stephen Zuckerman, Ph.D.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ Impact of Restrictive State Medicaid Policies on Utilization and Expenditures in the Medicaid Program

Roberto Vargas, M.D., M.P.H., Carole Gresenz, Ph.D., Jessie Riposo, M.S., Janet Rogowski, Ph.D., Jose Escarce, M.D., Ph.D.

Presented By: Roberto Vargas, M.D., M.P.H., Assistant Professor/Associate Natural Scientist, Divsion of General Internal Medicine and Health Services Research, David Geffen School of Medicine at UCLA and the RAND Corporation, 911 Broxton Ave, Los Angeles, CA 90024, Phone: (310) 794-3703, Fax: (310) 794-0732, Email: RBVargas@mednet.ucla.edu

Research Objective: The Federal Deficit Reduction Act of 2006 has greatly increased state Medicaid programs' ability to limit services to enrollees. We aim to compare the impact of restrictive state Medicaid policies on utilization and expenditures in a nationally representative

sample of Medicaid fee-for-services (FFS) enrollees over a six-year period.
Study Design: We obtained data on state Medicaid policies by reviewing the State Medicaid Plan Summaries for all fifty United States and the District of Columbia from 1997-2002. We estimated multivariate regression models with simulations to assess the impact of state Medicaid policies, including limits and co-pays for physician visits, co-pays for emergency room visits, co-pays and a three-drug per month limit for prescription drugs, and co-pays for inpatient admissions on health care utilization and expenditures for Medicaid-FFS recipients. We ran all models controlling for individual demographics and health status and community level measures of health care market factors, health care resources, race/ethnicity percent and socioeconomic status.
Population Studied: Respondents to the Medical Expenditure Panel Survey (MEPS) who were enrolled in Medicaid-FFS and who were 18-65 years old.
Principle Findings: Of the Medicaid policies analyzed, prescription drug and physician visit co-pays were the most frequently implemented. (29-31 and 17-19 states respectively from 1997-2002) 74% of enrollees had at least one office-based physician visit, 24% had at least one emergency room visit, and 14% had at least one inpatient admission. Enrollees averaged $5,401 in total expenditures and $1,459 in prescription drug expenditures. We found that restrictive Medicaid policies, particularly co-pays, have significant effects on utilization and expenditures, but to varying degrees. For example, co-pays for physician visits led to lower simulated rates of emergency department use (20% compared to 25%; $p<0.10$) and significantly higher rates of inpatient hospitalization (18% compared to 13%; $p<0.05$). Prescription drug co-pays led to fewer physician office-based visits (5.58 compared to 6.70; $p<0.05$), but had no significant impact on visits that included non-physician care, emergency room visits, or inpatient hospital stays. We also found that inpatient admission co-pays of greater than $21 led to lower rates of inpatient hospitalization (9% compared to 15%; $p<0.10$) Our analysis of expenditures found that co-pays for physician visits led to significantly higher average total expenditures ($5,431 compared to $4,271; $p<0.05$), while emergency room and prescription drug co-pays led to lower total expenditures ($3,719 compared to $4,665; $p<0.01$) and ($4,145 compared to $5,088; $p<0.05$), respectively.
Conclusions: Restrictive state Medicaid policies are significantly associated with health care utilization and expenditures for enrollees. Some results were as expected, such as inpatient co-pay's association with lower hospitalization rates, whereas some may reflect unintended consequences such as physician visit co-pay's association with higher hospitalizations and expenditures.
Implications for Policy, Practice or Delivery: As state Medicaid programs gain greater flexibility in implementing restrictive policies they should take into account the varying effects of policies on limiting care and potential unintended consequences including increased hospitalization rates and expenditures.
Funding Source: AHRQ, NCMHD and NCRR/NIH

- **An Individually-Matched Control Group Evaluation of a Program to Improve Quality of Care & Control Costs in a Diabetic Medicaid Population**

Kenton Johnston, M.P.H., M.S., M.A., William Westerfield, M.A., Terry Whitlock, M.B.A., Soyal Momin, M.S., M.B.A., Raymond Phillippi, Ph.D.

Presented By: Kenton Johnston, M.P.H., M.S., M.A., Bio-Statistical Research Analyst, Health Seervices Research & Outcomes, BlueCross BlueShield of Tennessee, 801 Pine Street - 3E, Chattanooga, TN 37409, Phone: (423) 535-5701, Fax: (423) 535-5100,
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Research Objective: The purpose of this study was to evaluate a diabetes care management program for a state Medicaid population. Specifically, the outcomes of interest were diabetic quality of care and medical cost savings.
Study Design: The methodology used was control group matching with baseline to intervention period comparison. Medicaid diabetic members not enrolled in the diabetes care management program were individually matched to Medicaid diabetic members enrolled in the program using propensity score matching based on data from the 12-month baseline period of January through December 2004. The propensity model factored in demographic information, diseases and comorbidities, quality of care indicators, as well as medical services utilization and allowed costs. There were no statistically significant differences between the intervention group and the control group during the baseline period. Starting from January 1st, 2005, 12-months of medical utilization, cost,

quality of care, and lab information was collected from the claims database for study members and their matched controls. Diabetic quality of care was operationally defined according to recommended preventive services for diabetics outlined by the American Diabetes Association.
Population Studied: The intervention group consisted of 154 Medicaid members who were enrolled in the diabetes care management program for at least 6 months during 2005. The control group consisted of 154 Medicaid members who were not enrolled in the program at all during 2004 or 2005. Both intervention and control group members were continuously enrolled in Medicaid for the 24-month period of 2004 and 2005 with confirmed diagnoses for Type I or Type II Diabetes in 2004 or earlier.
Principle Findings: Our findings show a statistically significant positive difference between the intervention group and the control group on four of the five diabetic quality of care measures—screening for kidney disease, retinopathy screening, first annual HbA1c screening, second annual HbA1c screening—and on the overall diabetic quality score measure (an aggregate of five measures). Although none of the cost and utilization findings were statistically significant, there were positive results. Inpatient days, inpatient stays, and inpatient allowed costs were much lower for the intervention group compared to the control group. In addition, the average per member savings for those in the intervention was $1,012 in 2005, representing a total group savings for the 154 members of nearly $156,000.
Conclusions: The use of a propensity-matched control group enables us to conclude that the greater improvement in quality in the intervention group was not due to a general secular trend towards greater quality, but to the diabetes care management program intervention itself. There were also positive financial findings that show a trend in the right direction. Nonetheless, it should be cautioned that the financial differences between the study and control group were not statistically significant.
Implications for Policy, Practice or Delivery: Care management programs can be successful in improving quality of care and controlling costs in chronically diseased state Medicaid populations. Individual control group matching with propensity modeling is a valuable tool for evaluating care management outcomes in small to medium sized populations.
Funding Source: BlueCross BlueShield of Tennessee

- **Primary Care Continuity & Health Care Expenditures in a Sample of Florida Medicaid Recipients**

Andrea Lee, M.S., Robert G. Frank, Ph.D., Natalie C. Blevins, M.S., M.H.A., Zoe N. Swaine, M.S., Heather Steingraber, B.S.

Presented By: Andrea Lee, M.S., Graduate Assistant, Clinical and Health Psychology, Florida Center for Medicaid and the Uninsured, 101 S Newell Drive, Suite 4101, Gainesville, FL 32611, Phone: (352) 273-5130, Fax: (352) 273-5061, Email: alee04@phhp.ufl.edu

Research Objective: In 2001, Medicaid accounted for 27 percent of total national spending on mental health services, the single largest source of mental health financing . Thirteen percent of Medicaid beneficiaries rely on Medicaid for mental health benefits. Studies have demonstrated that continuity of care is associated with lower health care utilization and cost. However, few studies examined continuity of care for mental health populations. This study examines the association between primary care continuity of care and health care expenditures in a group of depressed Florida Medicaid recipients.
Study Design: This study examined the association between continuity of care and health care expenditures using a cross-sectional study design. Total, medical, inpatient, outpatient, emergency room, and pharmacy expenditures were examined. Eligible study participants included all Florida Medicaid Medipass recipients with a primary or secondary diagnosis of depression, as determined by ICD-9 codes, between the months of July 1, 2000 to June 30, 2001. Recipients were excluded from the study if they were diagnosed with the same disorder within the previous 180 days, not continuously eligible for Medicaid 180 days before the index diagnosis date, or under the age of 18 or over age 65 as of July 1, 2000. Continuity of care was measured with the Modified, Modified Continuity Index. Continuity index scores were treated as a continuous variable, ranging from 0 to 1, low to high.
Population Studied: There were 8,680 depressed Medicaid recipients in this sample. Seventy-seven percent were female. Fourty-two percent of the sample were white, 13.8 percent were black, 5.6 percent Hispanic, and 38.2 percent were classified as other. Over fifty percent of Medicaid recipients were between the ages of 45-64. The continuity index distribution for the sample was as follows: 56.5 percent had a

continuity index score between .8 and 1.0, 21.2 percent had an index score between .6 and .79, and 22.5 percent had less than .6 continuity index score.
Principle Findings: Medicaid recipients with depression with lower continuity of care were more likely to have any inpatient, outpatient, or emergency room expenditures. Furthermore, higher continuity of care in this sample predicted lower total, medical, inpatient, outpatient, and emergency room expenditures, but higher pharmacy expenditures.
Conclusions: Study results indicate that higher continuity of care for depressed, low-income patients is associated with lower health care expenditures for all types of cost, except for pharmacy expenditures. Thus, higher continuity of care seems to have an impact on overall health care spending for depressed patients. The rise in pharmacy expenditures with increased continuity of care may be due to increased medication compliance and usage as a result of the quality relationship built with a single provider.
Implications for Policy, Practice or Delivery: This study suggests that continuity of care may be an important consideration in the long-term care of patients with chronic conditions, such as depression. Furthermore, this study suggests that continuity of care may be a means for cost-containment in the Medicaid program. Further research will need to be done on other populations.
Funding Source: Florida Agency for Health Care Administration

- Interruptions in Medicaid Coverage Increases the Risk of Hospitalizations for Ambulatory Care Sensitive Conditions

Andrew B. Bindman, M.D., Arpita Chattopadhyay, Ph.D., Glenna Auerback, M.P.H.

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Research Objective: Many low-income Americans move in and out of Medicaid. Interruptions in Medicaid coverage could have negative health consequences for beneficiaries that result in their needing to be hospitalized.
Study Design: We performed a survival analysis to model the impact of interruptions in Medicaid coverage on the risk of hospitalization for ambulatory care sensitive (ACS) conditions such as asthma and diabetes among all beneficiaries in California. Data were obtained from a linked file of the state's hospital patient discharge data and a monthly Medicaid eligibility file. We excluded those 65 years and older assuming they would also have Medicare coverage and those less than 1 because they disproportionately lacked social security numbers needed to perform the data linkage. The dependent variable was the duration of time from enrollment in Medicaid to a hospital admission for an ACS condition (at-risk period). The main predictor was a time varying covariate indicating whether the individual had continuous or interrupted Medicaid coverage throughout the at-risk period. Observations were censored at the end of the study period, when an individual died, or reached age 65. Following an admission and re-enrollment in Medicaid, the same individual could begin another at-risk period. We controlled for year at the start of the at-risk period and Medicaid beneficiary's age, gender, ethnicity, Medicaid eligibility group (TANF/SSI/Other), and Medicaid delivery model (fee-for-service or managed care) other insurance coverage, and number of at-risk periods.
Population Studied: 9,858,593 individuals ages 1 to 64 years enrolled for a minimum of 1 month in California's Medicaid program between 1998 and 2002. The mean age was 18 years and 57% were female. 52% were Latino, 11% were African-American, 8% were Asian, and 29% were white or in other racial/ethnic groups. 40% were eligible for Medicaid through TANF, 8% through SSI, and 53% through other eligibility categories. 46% were in managed care and 8% had supplementary insurance.
Principle Findings: 5,962,602 (60%) had an interruption of their Medicaid coverage during the study period and 74,289 (2%) had at least 1 hospitalization for an ACS condition. Persons with interruptions in coverage were slightly older (mean age 18.6 vs 18.2 years) and more likely to be female (58% vs 42%) and Latino (53% vs 47%). The adjusted relative hazard for a preventable hospitalization was 2.9 among those with interruptions in their Medicaid coverage compared to those with continuous coverage ($p<.0001$). 30,201 of 195,146 (16%) of the hospitalizations for ACS conditions were among individuals who had interrupted Medicaid coverage; 69% of them ultimately had that hospitalization covered by the Medicaid program.

Conclusions: Despite the fact that sicker patients would be more likely to maintain continuous Medicaid coverage, the risk for preventable hospitalization was significantly greater among those with interruptions in their Medicaid coverage.
Implications for Policy, Practice or Delivery: Minimizing lapses in health insurance coverage can decrease both the negative health impact on the individual and the financial burden on Medicaid program's that inevitably pay for excess hospitalizations. Medicaid programs should consider these hidden costs in the development of their eligibility policies.
Funding Source: CWF

▪ **Is Medicaid Coverage as Good as Private Insurance or No Better than Being Uninsured**
Jack Hadley, Ph.D.

Presented By: Jack Hadley, Ph.D., Principal Research Associate, Health Policy Center, Urban Institute, 2100 M Street, NW, Washington, DC 20037, Phone: (202)261-5438, Fax: (202) 223-1149, Email: jhadley@ui.urban.org

Research Objective: To compare medical care use and outcomes by insurance status (Medicaid, private, or uninsured) for nonelderly people who have an accident or develop a new chronic condition
Study Design: Multivariate regression analysis of various measures of medical care use (numbers and types of specific services used, medical spending and charges) and short-term changes (up to 7-9 months) in health status pre and post the accident or new chronic condition. Insurance status is treated as exogenous by limiting the sample to people who have the same insurance status two months before, the month of, and the month after the accident or new chronic condition. The multivariate models control for baseline health and socio-demographic characteristics, and the specific condition associated with the accident or new chronic condition. Separate analyses were conducted for the accident and new chronic condition samples.
Population Studied: Non-elderly adults and children who participated in the Medical Expenditure Panel Study between 1996 and 2003. Survey questions identified 18,080 accident cases and 8,963 new chronic condition cases.
Principle Findings: Medicaid beneficiaries appear to receive about the same quantities of care as the privately insured, and both of these groups received significantly more care than the uninsured. the privately insured experienced consistently and significantly better short-term changes in health than the uninsured. Medicaid beneficiaries had similar health outcomes to the privately insured in the new chronic condition sample, but had poorer health outcomes than the privately insured in the accident sample. Further analysis of medical spending data indicated that although the quantities of services received were similar for the privately insured and Medicaid beneficiaries, spending levels were actually signficantly lower for Medicaid beneficiaries in the accident sample.
Conclusions: The differences in Medicaid beneficiaries' health outcomes relative to the privately insured among people who have an accident or develop a new chronic condition appears to be due to lower medical spending by Medicaid beneficiaries in the accident sample and statistically similar spending in the new chronic condition sample. There were also differences in Medicaid beneficiaries' use of office-based care relative to the privately insured in the two samples. The uninsured received less care and had worse short-term changes in health than the privately insured in both the accident and new chronic condition samples.
Implications for Policy, Practice or Delivery: Expanding insurance coverate to the uninsured will increase their use of medical care and improve their health outcomes. Medicaid reimbursement policies that discourage office-based care and pay very low rates relative to private insurance may result in lower quality of care and subsequently poorer health outcomes compated to the privately insured.
Funding Source: Kaiser Family Foundation

Public Coverage for Children: SCHIP, Access & Sustainability

Chair: Andrew Hyman, J.D.

Tuesday, June 5 • 10:45 a.m.-12:15 a.m.

▪ **Growing Pains for the Los Angeles Healthy Kids Program—Sustainability Challenges Despite Proven Effectiveness**
Ian Hill, M.P.A., M.S.W., Brigette Courtot, M.P.H., B.A., Patricia Barreto, M.D., M.P.H., Eriko Wada, M.P.P., Louise Palmer, M.A., Enrique Castillo

Presented By: Ian Hill, M.P.A., M.S.W., Principal Research Associate, Health Policy Center, The Urban Institute, 2100 M Street, NW,

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Research Objective: To assess the ongoing implementation of the Los Angeles Healthy Kids Program, modeled after the state's SCHIP program and designed to extend comprehensive health insurance to children in families with incomes below 300 percent of poverty who are ineligible for Medi-Cal and Healthy Families. This study identifies both the program's successes in reaching, enrolling, and caring for children, as well as the challenges it has faced in securing stable financing.
Study Design: The four-year evaluation, which began in May 2004, comprises multiple qualitative and quantitative components, including case studies, focus groups, administrative data analysis, and a longitudinal household survey. This paper primarily focuses on findings from the project's second round case study and focus groups, synthesizing information from over 50 interviews with county stakeholders and 10 focus groups with parents of child enrollees.
Population Studied: Children in the Los Angeles Healthy Kids Program, who are primarily undocumented immigrants given the program's eligibility rules.
Principle Findings: By many measures, Healthy Kids continues to be a significant success. The program enjoys the strong support and commitment of County officials, philanthropies, and the non-profit L.A. Care Health Plan. A diverse group of community-based organizations conduct intensive, culturally-appropriate outreach and assist families in applying for coverage. Focus groups with parents reveal that the program's application and renewal processes are easy, that benefits are comprehensive, that copayments are largely affordable, and that the managed care network is affording good access to care. First round household survey results confirm that Healthy Kids enrollment is associated with both improved access to usual sources of health and dental care, and improved confidence among parents that they can meet their children's health care needs without financial hardship. Yet the program's ability to continue serving children is in jeopardy due to insufficient funding. In June 2005, enrollment for children ages 6-18 was frozen, and total program enrollment has since stagnated at roughly 42,000 children. Furthermore, enrollment among children ages 0-5 has also dipped, as outreach has been hampered in promoting a program that cannot serve children of all ages in low-income families. Despite strong advocacy efforts promoting legislation for statewide funding and a ballot initiative to support Children's Health Initiatives across California, these measures have failed to be put into law. Still, hopes have recently risen as Governor Schwarzenegger unveiled in January 2007 a proposal to extend health insurance to all Californians, including children, regardless of their immigration status.
Conclusions: Results of the Healthy Kids Evaluation show that the program, now in its fourth year, continues to effectively serve over 40,000 largely undocumented, Latino children. Yet the ability of Healthy Kids to expand its reach and continue to serve enrollees has been stymied by funding shortfalls.
Implications for Policy, Practice or Delivery: A SCHIP-like program, free of "public charge" stigma, utilizing hands-on community-based outreach and providing broad benefits through a culturally-appropriate provider network, can succeed in improving coverage and access for low-income, undocumented children. In the absence of stable and ongoing federal and state funding, however, the ability of such a local-level initiative to sustain its success is questionable.
Funding Source: First 5 LA and The California Endowment

- Continuity of Coverage among Georgia's Publicly Covered Children

Patricia Ketsche, Ph.D., M.H.A., M.B.A., Angela Snyder, M.P.H., M.Phil, Mei Zhou, M.S., E. Kathleen Adams, Ph.D., Karen Minyard, Ph.D.

Presented By: Patricia Ketsche, Ph.D., M.H.A., M.B.A., Associate Professor, Institute of Health Administration and Georgia Health Policy Center, Georgia State University, PO Box 3998, Atlanta, GA 30302-3988, Phone: 404-651-2993, Fax: 404-651-1230, Email: pketsche@gsu.edu

Research Objective: Georgia's S-CHIP (PeachCare) eligibility is designed to complement Medicaid eligibility so that most children under age 19 living in families with incomes below 235 percent of FPL are eligible for one of the two public programs. As in many states, eligibility moves from Medicaid to S-CHIP when a child attains a certain age because the Medicaid income eligibility levels fall. This transition creates a point at which children can easily lose public coverage. We explore the magnitude of this problem, the characteristics of children associated with loss of coverage, and the likelihood of returning to either program

among those who lose coverage in Georgia at transitional birth dates.
Study Design: We use claims and eligibility data from Georgia's PeachCare and Medicaid programs from January 2000 through December 2002. We examine the enrollment of children pre- and post their first and sixth birthdays when eligibility requirements change. Since expected health care expenses affect the decision to enroll in public programs, we measure the effect of prior expenditures on the likelihood of dropping public coverage after controlling for other known demographic characteristics.
Population Studied: We study coverage for more than 225,000 publicly covered children who turn 1 or 6 between January 2000 and December 2002.
Principle Findings: Among children reaching their first birthday while enrolled in Medicaid, 41 percent drop coverage for at least 2 months after reaching this age and fewer than 13 percent returned to a public program after dropping coverage. Among publicly covered children reaching their sixth birthday, the drop rates are much lower (13 percent) but these older children are far more likely to return to the program (26 percent). After controlling for other factors (e.g. race/ethnicity, eligibility category, location) having lower than average historical expenditures is predictive of losing coverage at the transition birth date. Among droppers, having higher than average historical expenditures is predictive of reenrollment, especially among 6 year olds reenrolling in S-CHIP where a small monthly premium is required. Upon reenrollment, droppers utilize less care than enrollees who maintained coverage at their transitional birthday.
Conclusions: Despite public program eligibility that is designed to move children from Medicaid to S-CHIP, a large proportion of infants (41 percent) and a smaller but still significant number of 6 year olds (13 percent) are losing coverage at their transitional birth date. Compared to children who remain enrolled, these children have lower than average health care expenses prior to losing coverage.
Implications for Policy, Practice or Delivery: Approximately two thirds of Georgia's uninsured children are eligible for PeachCare or Medicaid. Administrative simplification to facilitate continuous enrollment would greatly expand coverage among these children while retaining in the program children with lower than average claims cost. This may be one of the most cost-effective ways to reduce the number of uninsured children in Georgia.

Funding Source: RWJF

- Premium Increases and Disenrollment from SCHIP

Silviya Nikolova, Ph.D. Candidate

Presented By: Silviya Nikolova, Ph.D. Candidate, Economics, University of North Carolina - Chapel Hill, 1800 Baity Hill Drive, Apt. 323, Chapel Hill, NC 27514, Phone: (919) 357-6589, Email: nikolova@email.unc.edu

Research Objective: It is common practice in the State Child Health Insurance Program (SCHIP) to use premiums of modest magnitude to prevent private insurance crowd-out and to reduce state budget costs. Unfortunately, little is known about the extent to which efforts to keep children enrolled are hampered by the requirement some states impose beneficiaries to pay premiums. In this paper I attempt to answer the following question: Do premium increases lead to disenrollment from SCHIP?
Study Design: I study the impact of premium on enrollment using data from the Medical Expenditure Panel Survey (MEPS) panels covering calendar year 2003. In particular, I use the Household Component (HC) of the MEPS. It collects data on public health insurance status on monthly basis in addition to information on family composition, income, employment, health conditions and demographics. To identify the SCHIP insured, I simulate the eligibility for every child in MEPS which only provides information on any public insurance using state-level eligibility rules and premiums data merged to the MEPS at the state level. Although, MEPS is designed to produce nationally representative estimates for insurance coverage, it can also support the estimation of state-specific models for the largest states.
Population Studied: I follow the public insurance status and eligibility of 10,421 children age 18 and younger on a monthly basis for up to 12 months and analyze the impacts of premium level changes, eligibility rules changes and age changes.
Principle Findings: I start by studying the individual enrollment patterns in the three largest states where there are at least two groups of families within the SCHIP category paying different premiums. Plotting the predicted enrollment rate of the two groups as a function of the family income index consistently demonstrates a discontinuous jump at the income cutoff between the two groups with higher income families with higher premiums

above the cutoff being less likely to have their children enrolled in the program. Premium effect estimates depend on the bandwidth chosen around the income cutoff with smaller bandwidths suggesting smaller effect. In particular, for the largest state, these estimates correspond to an estimated enrollment elasticity evaluated at the mean in the range of (-0.03; -0.01), depending on the month studied, for the sample of families within 15% FPL from above and below the cutoff. Thus doubling of premium is predicted to lead to a small decrease of (-3%; -1%) in the probability a child in this state will be disenrolled from the SCHIP.
I also study the impact of premium on being enrolled combining data on all states. I do this in a Regression-Discontinuity (RD) setting to exploit the existence of discontinuities in each state's public health insurance and premium assignment process to obtain reliable estimates of premium increase on disenrollment. The estimates based on a RD approach affirm the single-state findings that higher premiums impact negatively enrollment. This result reinforces earlier findings of Hadley et al (2006), Kenney et al. (2006), and Marton (2006).
Conclusions: Premium increases lead to disenrollment from SCHIP. However, the decrease in enrollment is small. Thus making families accountable for a larger share of the cost of their children health care could manage to partially offset the financial burden that states are bearing while preserving the ability of the beneficiaries to access health services.
Implications for Policy, Practice or Delivery: This study suggests that, through careful design of the premium policy, states can maintain high rates of health insurance coverage for children and, at the same time, charge premiums of different magnitude depending on family income.

▪ The Differential Effect of the SCHIP Expansions by Children's Age

Ithai Lurie, Ph.D.

Presented By: Ithai Lurie, Ph.D, Financial Economist, U.S. Department of the Treasury, 1500 Pennsylvania Avenue, NW, Washington, DC 20220, Phone: (202) 622-1789, Fax: (202) 622-8784, Email: ithai.lurie@do.treas.gov

Research Objective: The study tests for differences across age groups in the effect of SCHIP on children's insurance coverage and physician visits. Three different age groups of children are considered: pre-elementary school–aged children 0–5 (pre-ESA), elementary school–aged children 6–12 (ESA), and post-elementary school–aged children 13–18 (post-ESA). The choice of these three age groups is based on differences in pre-SCHIP income eligibility thresholds for public health insurance dictated by federal mandates. Two countervailing factors are likely to influence public coverage take-up by newly eligible children. Younger children have greater demand for health insurance coverage, but because of the baseline higher rate of eligibility for younger children, the SCHIP expansion will only tend to operate among families with higher incomes, which is likely to result in lower take-up rates.
Study Design: Using Survey of Income and Program Participation (SIPP) data from 1996 and 2001 on insurance coverage and physician visits, the study employ a difference-in-differences approach to estimate separately the effect of the SCHIP expansion on insurance coverage and physician visits of newly eligible children for each age group (pre-ESA, ESA and post-ESA). The two differences being: 1) pre verses post SCHIP and 2) "newly eligible" children for public coverage verses "not newly eligible". The study also evaluate whether SCHIP affected health insurance coverage and physician visits differently across the three age groups.
Population Studied: The study uses data from the SIPP from 1996 and 2001. Overall there are 29,591 children in families with income below the 300 percent of the Federal Poverty Line in the sample. Pre-ESA children represent about 33% of the sample, ESA children represent about 39% of the sample and post-ESA children represent about 28%.
Principle Findings: The pre-ESA children had a small but significant increase in public coverage (5.2 percentage points), which mostly substituted private coverage, yet resulted in an increase in the likelihood of physician visits by 4.8 percentage points. The ESA children were not affected by the SCHIP expansion. Post-ESA children experienced a small but significant increase in public coverage (8.0 percentage points), mostly because of uninsured children taking public coverage (a 4.8 percentage point decline in the uninsured rate), and as with pre-ESA children, post-ESA children had an increased likelihood of visiting a physician after SCHIP (by 7.5 percentage points). Bootstrap estimates of the cross–age group differences in outcomes suggest that take-up and physician visits for post-ESA are significantly higher than they are for ESA children.

Conclusions: The very different effects of SCHIP on health insurance coverage and physician visits imply that using a single measure for assessing the effect of SCHIP across all ages can be misleading.
Implications for Policy, Practice or Delivery: States seeking relief from budget deficits may want to roll back some of the SCHIP expansion, or seek higher co-payments for treatment. Knowing how SCHIP affected children at different ages can help in structuring and implementing the rollback. Whichever strategy states take, there is a tradeoff between how much saving the rollback can provide and whether children's health insurance or health care treatment is affected.

▪ **Rural Children's Access to Behavioral Health Services in Medicaid**
Robert Saunders, M.P.P., Craig Anne Heflinger, Ph.D.

Presented By: Robert Saunders, M.P.P., Research Associate, Dept. Human & Organizational Development, Vanderbilt University, Box 90 GPC, Nashville, TN 37203, Phone: (615) 322-8284, Fax: (615) 322-1141, Email: Robert.C.Saunders@Vanderbilt.Edu

Research Objective: (1) To examine rural and urban differences in access to behavioral health services for children over time in a managed Medicaid program. Considers differences in the relative mix of inpatient/residential and specialty outpatient care and LOS in inpatient/residential settings. (2) Examines the effect of shifting to a managed care carve out for behavioral services from a carve-in.
Study Design: Uses multilevel models to assess change in the access rate over time as a function of individual and county-level differences in annual access rates, rates of use of inpatient/residential and specialty outpatient care, and LOS in inpatient/residential settings. Uses repeated measures on individuals over time by county. Performance measures are calculated on a quarterly basis between July 1994 and June 2003. Managed behavioral health care started in this state in 1996 with significant changes in contracting in 1998.
Population Studied: The study uses claims/encounter and enrollment data for all Medicaid-enrolled youth ages 4-17 in Tennessee (n=400,000 enrollees per year).
Principle Findings: Rural youth access behavioral services at a rate below that of urban cohorts. Access to behavioral health services increased in rural and urban areas initially after implementation of the carve out. However, the increases tapered off within two years. Similar patterns emerged for urban and rural youth in the relative mix of inpatient/residential and specialty outpatient care used, with declines in inpatient/residential and services like day treatment and IOP and increases in case management and individual therapy. Urban and rural differences persisted after the managed care carve out.
Conclusions: Shifting to a managed care carve out resulted in short term improvements in access to behavioral health services for both rural and urban youth. However, this policy change was not sufficient to reduce the disparities in services accessibility between these populations.
Implications for Policy, Practice or Delivery: A managed behavioral health carve out may lead to improved system performance on measures of services accessibility. However, their specialized expertise in behavioral issues alone is not sufficient to address persistent access differences between rural and urban youth. BHOs may need to consider ways to increase service availability in rural areas with lower cost substitutes, including adding primary care doctors to their networks and partnering with community and faith-based groups in underserved communities rather than expanding traditional mental health and substance abuse treatment facilities. These may also increase the palatability of seeking help for behavioral health problems in rural areas.
Funding Source: NIMH & NIDA

Medicare

Medicare Advantage & Regional Variation Issues in Medicare

Chair: Bryan Dowd, Ph.D.

Sunday, June 3 • 3:00 p.m.-4:30 p.m.

▪ **The Relationship Between Health Status and Health Services Utilization: A Comparison Between Medicare Managed Care & Fee-For-Service Beneficiaries**
Vijit Chinburapa, Ph.D., C.P.H.Q., Beth Hartman Ellis, Ph.D., MaryAnne D. Hope, M.S., Laura Giordano, R.N., M.B.A., C.P.H.Q.

Presented By: Vijit Chinburapa, Ph.D., C.P.H.Q., Senior Healthcare Researcher, Survey Research

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Research Objective: The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 provided incentives for private health plans to join or remain in the Medicare program. Approximately 13 percent of Medicare beneficiaries were enrolled in the Medicare Advantage (MA) plans as of 2005. This percentage is projected to increase to 30% by 2030. Previous research has found favorable selection in managed care; younger and healthier beneficiaries tend to select managed care health plans, and be expected to have lower health expenditures and utilization. However, relatively little is known about the extent of the differences in health services utilizations between managed care and FFS beneficiaries after differences in physical and mental health status are accounted for. This study examined the differences in health services utilization between Fee-for-Service (FFS) and managed care (MA) Medicare beneficiaries after physical health status, mental health status, age, gender, race, education attainment, smoking status, Medicaid dual eligibility, and proxy status were taken into account.
Study Design: The study employed cross-sectional retrospective analyses of MA and FFS Medicare beneficiaries who participated in five national surveys. These surveys were conducted in 2000 and include the cohort 1 follow up Medicare Health Outcomes Survey (HOS), the cohort 3 baseline Medicare HOS, the MA Consumer Assessment of Healthcare Providers and Systems (CAHPS) enrollee survey, the MA CAHPS Disenrollee Assessment survey, and the FFS CAHPS survey. Health status was measured by the SF-12 Physical Component Summary (PCS) and Mental Component Summary (MCS) scores. Health utilization was measured based on self-reported presence or absence of hospitalization in the last 12 months, and self-reported frequency of visits to doctors or specialists in the last 6 months. Multinomial logistic regression analyses were used to model health services utilization (presence or absence of hospitalization; self-reported frequency of low [0-1 visit], moderate [2-4 visits], or high [>= 5 visits] to physician's office or specialist's office) as a function of system of care (MA or FFS), the PCS and MCS scores, age, gender, race, education, dual eligibility, proxy status, and smoking status. For each outcome, a series of nested models were fitted to the data. The likelihood ratio test was used to determine whether dropping two-way interaction effects from a more complex model significantly affected the log likelihood ratio, and whether each of the predictor variables was statistically significant.
Population Studied: Medicare beneficiaries aged 65 and older without end stage renal disease (ESRD) who were continuously enrolled for at least 6 months served as the population for the study. The combined 2000 Medicare HOS cohort 1 follow up and cohort 3 baseline (237,172 records) were linked with the managed care enrollee and disenrollee Assessment surveys (238,417 records) by unique health information number, resulting in a match of 17,091 managed care enrollees. The sample of 17,091 managed care enrollees was found to be similar to the total MA CAHPS national survey sample in the studied characteristics. The 2000 Medicare FFS sample included 82,224 beneficiaries aged 65 or older without ESRD. The survey data for the 17,901 Medicare managed care beneficiaries were combined with FFS CAHPS survey data of 82,224 Medicare FFS beneficiaries to form an analytic file with 100,125 beneficiaries.
Principle Findings: After accounting for differences in health status and other covariates, the adjusted probability of having a hospitalization or having a high frequency of doctor visits or specialist visits is higher in FFS than managed care. Moreover, the differences between FFS and managed care beneficiaries are larger at lower levels of health status. At low levels of MCS scores, the adjusted probability of hospitalizations is 20.84 percent and 17.17 percent for FFS and MA beneficiaries, respectively. The adjusted probability of having 5 or more doctor office visits is 42.70 percent and 36.26 percent for FFS and MA beneficiaries at low levels of PCS scores; 26.23 percent and 20.86 percent for FFS and MA beneficiaries at low levels of MCS scores, respectively.
Conclusions: MA beneficiaries reported a lower level of health services utilization than FFS beneficiaries; and the differences between FFS and MA beneficiaries in self-reported utilization are larger at lower levels of health status. Managed care beneficiaries with poor mental health are not as likely to be hospitalized as FFS beneficiaries. At low levels of physical and mental health, FFS beneficiaries are more likely to have a high frequency of doctor visits, compared to managed care beneficiaries.

Implications for Policy, Practice or Delivery: Future research should examine possible reasons for these differences between FFS and managed care and the relationship to quality of care. The differences may be attributable to higher out-of-pocket costs for managed care beneficiaries, managed care health plans that operate more efficiently, effective disease management programs, a combination of these reasons, or due to unobserved differences between managed care and FFS beneficiaries. Understanding which of these reasons best explains the discrepancies between managed care and FFS beneficiaries is important in designing and implementing Medicare policy that will provide the most effective care to all Medicare beneficiaries at the lowest cost possible.

Funding Source: CMS

- **An Examination of Resource Use Variation in a Medicare HMO**

Eric Barrette, M.A., Robert Town, Ph.D., Nancy Walczak, Ph.D.

Presented By: Eric Barrette, M.A., Graduate Research Assistant, Health Policy and Management, University of Minnesota, 136 Western Avenue N #106, St. Paul, MN 55102, Phone: (612) 202-3670, Email: barre142@umn.edu

Research Objective: Significant regional variations in the utilization of medical resource have been found in the traditional indemnity (fee-for-service) Medicare population. It is unclear how much the differences are driven by provider behavior that can be modified. Specifically this project attempts to answer the question: how much does a Medicare health maintenance organization (HMO) reduce regional variation through utilization controls compared with price controls? Regional variations are hypothesized to be lower within a Medicare HMO than within traditional Medicare because an HMO has some control over physicians, for example through utilization reviews or reductions in patients' provider choices.

Study Design: This paper focuses on variations in resource use between regions throughout the U.S. within the same HMO using a quasi-experimental retrospective analysis. Each individual was assigned to a geographic region based on the zip code of the hospital to which they were admitted for a hip fracture. Variation is tested by comparing the ratios of allowable charges between regions.

Population Studied: The dataset for this paper consists of insurance claims data from an anonymous Medicare HMO. It includes all inpatient, outpatient, and physician insurance claims for 1159 individuals from the 3rd quarter of 2004 through the 2nd quarter of 2006 for patients who were admitted to a hospital with a primary diagnosis of a hip fracture during the first year of observation. An exceptional feature of the dataset is the inclusion of both the amount the HMO was billed (billable) for services as well as the amount the HMO paid for services (allowable).

Principle Findings: Preliminary results found the lowest ratio, 0.49, is nearly 4 times less than the highest ratio of 1.95 implying some type of variation exists within the HMO. However, because HMOs are able to negotiate lower prices, the next step in the analysis will be to distinguish the utilization effect from the price effect. A standardized national price level will be created by simulating the cost of the services as if they are paid for by traditional Medicare. This will control for regional price variations and eliminate any price effects imposed by the HMO. Variation remaining in the simulated prices will be attributed to regional variations in resource utilization.

Conclusions: The existence of regional variations in utilization within an HMO suggests they are not able to completely influence providers' use of services. Further examination of specific regions, services, and prices will provide a better sense of the magnitude of the variations.

Implications for Policy, Practice or Delivery: This study focuses on the effect of the utilization controls on reducing the amount of services used. If HMOs can limit both price and quantity without affecting the quality of services, further exploration of HMOs as a means of limiting rising health care costs is warranted. Otherwise, alternative mechanisms of influencing provider behavior should be addressed.

- **Do Differences in Social Capital Explain Geographic Variations in Medicare Utilization**

Jackson Williams, J.D., M.P.A.

Presented By: Jackson Williams, J.D., M.P.A., Senior Policy Advisor, AARP Public Policy Institute, 601 E Street NW, Washington, DC 20049, Phone: (202)434-3894, Fax: (202) 434-6480, Email: jtwilliams@aarp.org

Research Objective: To determine correlations between social capital indicators and the intensity of Medicare FFS utilization. Social Capital theory holds that, in communities where individuals are more inclined to cooperate in collective ventures—whether because of a culture of trust or because they are involved in social networks—there is greater economic growth, more smoothly functioning democracy, or other normatively "good" outcomes. Conversely, the theory holds that in communities with low social capital, individuals are more likely to exploit positions of trust for personal gain. The study hypothesizes that doctors in low social capital regions will strike balances of self-interest with patients' or society's interests somewhat more in their own favor, thereby increasing utilization.
Study Design: Several state-level indicators of utilization of Medicare resources are regressed on state composite answers to the General Social Survey's trust query. Control variables are introduced to separate out effects of patient-initiated demand (which includes attitudes toward medical care, epidemiological differences, and moral hazard posed by Medigap coverage), system capacity, and benign practice style factors where appropriate. As a proxy variable for local patient preferences and attitudes toward medical care, the study uses take-up rates of employer-sponsored health insurance.
Population Studied: Medicare beneficiaries and their physicians
Principle Findings: Social capital as measured by the GSS trust query is negatively correlated with Medicare doctor visits and hospital days during the last 2 years of life, even controlling for patient attitudes, system capacity (specialist supply and hospital bed supply) and benign local variations that are present in the VA system. Higher regional growth in Medicare's imaging costs also appears related to low social capital although patient preferences also appear to play a role. Rates of five preference-sensitive procedures are examined: for three, lower extremity revascularization, prostatectomy, and carotid endarterectomy, there is a negative correlation with social capital; for a fourth, hip replacement, high social capital and good self-reported health are positively correlated; for four, Medigap coverage is positively correlated. (Similar results are observed in two non-Medicare geographic patterns: caesarean section rates and ratios of generic to brand drug prescribing.)
Conclusions: Lack of social capital is usually associated with normatively "bad" outcomes. The pattern of health care utilization that emerges in this study jarringly corresponds to regional patterns of predatory lending and "deadbeat dads," suggesting that the phenomenon of high medical utilization in low social capital regions could be rooted in, or facilitated by, opportunism on the part of doctors. The paper synthesizes previous research on social capital to create a typology of four contexts in which related phenomena may manifest themselves, citing examples of each from the health care sphere.
Implications for Policy, Practice or Delivery: Previous research has linked low social capital to slow adoption of evidence-based medicine, medical errors, and high levels of tort claiming. The association between social capital and geographic variations in health care utilization suggests that in some regions of the U.S., fee-for-service medicine is prone to abuse. This in turn suggests that in such regions, Medicare must wield a stronger hand in containing costs and/or better aligning payment incentives with efficiency and quality.

- Determinants of Variation in Medical Spending per Elderly Person: Does It Really Matter Where You Live?

Jack Hadley, Ph.D., Robert Berenson, M.D., Timothy Waidmann, Ph.D., Stephen Zuckerman, Ph.D.

Presented By: Jack Hadley, Ph.D., Principal Research Associate, Health Policy Center, Urban Institute, 2100 M Street, NW, Washington, DC 20037, Phone: (202) 261-5438, Fax: (202) 223-1149, Email: jhadley@ui.urban.org

Research Objective: To assess the relative importance of geographic and personal characteristics in explaining variations in medical spending per elderly person.
Study Design: Multivariate regression analysis of both total and Medicare spending per elderly person, as a function of area characteristics, including the county's rank in the End of Life Expenditure Index (EOLEI) developed by the Dartmouth Atlas, and detailed health and personal characteristics. Medical spending is defined as average spending per month over as long as 36 months.
Population Studied: Over 29,000 elderly Medicare beneficiaries who participated in the Medicare Current Beneficary Syrvey between 1992 and 2002. The sample is limited to

beneficiaries who were community residents and covered by Medicare's fee-for-service option at the time of their first interview. Personal and health characteristics are measured at baseline; total and Medicare spending are measured for up to 3 years or date of death (if earlier) after the initial interview. People who joined a HMO during the observation period were excluded after they joined the HMO. People who entered a nursing home or other long term care facility were retained in the analysis sample.
Principle Findings: The full regression model explained 33% of the variation in total medical spending per month for individual elderly Medicare beneficiaries. Geographic factors explained less than 1% of the total variations, and the difference in total medical spending per person between the lowest and highest deciles of counties grouped by the Dartmouth EOLEI was only 15%. Self-reported health status, physical limitations, and medical conditions were the most important determinants of medical spending variations. Stratifying the sample by health status eliminated almost all variation associated with geographic characteristics. Other significant determinants of spending variations included supplementary insurance coverage, family income, education, age, and satisfaction with the quality and ease of access to care. Racial and ethnic minorities had significantly lower spending than whites.
Conclusions: Variations in geographic characteristics, including the EOLEI rank of the area where people live, explain very little of the variation in elderly individuals' total medical spending over a three-year period.
Implications for Policy, Practice or Delivery: Policies aimed at reducing medical resource capacity in high cost areas are unlikely to be effective in reducing spending. Policy should focus on managing the cost of individual high cost cases and on discouraging the use of individual services in situations where they have limited clinical effectiveness, regardless of where people live.
Funding Source: RWJF

- **Does the VA Provide Veterans with Better Quality Preventive Care Compared to Medicare HMO plans?**

Salomeh Keyhani, M.D., M.P.H., Joseph Ross, M.D., M.H.S., Paul Hebert, Ph.D., Cornelia Dellenbaugh, M.P.H., Joan Penrod, Ph.D., Al Siu, M.D., M.S.P.H.

Presented By: Salomeh Keyhani, M.D., M.P.H., Assistant Professor, GRECC & Health Policy, James J Peters VAMC & Mount Sinai School of Medicine, 1 Gustave L Place Box 1077, New York, NY 10028, Phone: (212) 659-9563, Email: salomeh.keyhani@mountsinai.org

Research Objective: Some policy makers have advocated greater use of free-market mechanisms to improve the quality of care for Medicare beneficiaries. We compared the quality of preventive care of veterans cared for within the Veterans Health Administration (a government run system of care), to veterans cared for by Medicare HMO plans (privately administered plans subject to government regulation) and Medicare fee for service (a government funded plan subject to free market forces).
Study Design: We merged the Medicare Current Beneficiary Survey (MCBS) Costs and Use files between 2000-2002 and performed a cross sectional analysis of receipt of four self-reported preventive measures in the prior year:1) influenza vaccination 2) pneumococcal vaccination 3) serum cholesterol screening 4) and serum prostate-specific antigen (PSA) measurement among veterans. We compared the care of veterans who accessed care through 1) both the VHA and Medicare (dual users) 2) Medicare HMOs 3) Medicare FFS and 4) the VHA only using multivariate logistic regression analysis, adjusting for age, race, marital status, education, income, additional private insurance coverage, having a usual source of care, tobacco use, health status, service connected disability status, and an MCBS adapted Charlson Comorbidity Index.
Population Studied: 3997 male elderly veterans (>65) surveyed in the last year of their participation in the MCBS.
Principle Findings: Veterans who received care within the VHA (N=143) had lower incomes and less education, were more commonly active smokers with service related disabilities and more commonly reported fair or poor health when compared with dual using veterans (N=691), veterans who received care through Medicare HMOs (N=500) and veterans who received care through FFS Medicare (N=2663). Rates of self-reported excellent or very good health status were 42% among VHA only users, 37% among dual users, 57% among Medicare HMO participants, and 47% among Medicare FFS participants ($p<0.001$) and mean Charlson Comorbidity Indexes were 1.4, 1.6, 1.1, and 1.2, respectively ($p<0.001$). Self-reported rates of influenza vaccination ranged from 71% to 84%, pneumococcal vaccination ranged from 72% to

87%, cholesterol screening ranged from 80% to 91% and PSA measurement ranged from 67% to 77%. Compared to VHA only users, patients who received care through Medicare HMOs were less likely to receive influenza vaccination (OR=0.62, p<0.05), pneumococcal vaccination (OR=0.37, p<0.001), serum cholesterol screening (OR=0.56, p=0.1) and prostate cancer screening (OR=0.64, p<0.05). Similarly patients who received care through Medicare FFS were less likely to receive influenza vaccination (OR=0.40, p<0.001), pneumococcal vaccination (OR 0.23, p<0.001) serum cholesterol screening (OR=0.43, p<0.01) and prostate cancer screening (OR=0.61, p<0.05) compared to veterans who received care within the VHA. Dual users of VHA and Medicare FFS had no statistically significant difference in receipt of any of the four preventive measures compared to veterans cared for within the VHA.
Conclusions: Veterans who received care through the VHA were more likely to receive preventive measures compared to veterans who received care through HMO and FFS Medicare, suggesting that VHA provides higher quality preventive care despite serving a population who is sicker and whose socioeconomic characteristics are typically associated with worse preventive behaviors.
Implications for Policy, Practice or Delivery: We found that the VHA was superior to Medicare HMOs and FFS Medicare in delivering preventive care to veterans.

Medicare Part D

Chair: Robert Berenson, M.D.

Monday, June 4 • 9:00 a.m.-10:30 a.m.

▪ Medicare Beneficiary Response to Benefit Gaps versus Actuarially Equivalent Continuous Coverage for Prescription Drugs

Bruce Stuart, Ph.D., Joseph Terza, Ph.D., Lirong Zhao, M.S.

Presented By: Bruce Stuart, Ph.D., Professor, Pharmaceutical Health Services Research, University of Maryland Baltimore, 220 Arch Street, Room 12-212, Baltimore, MD 21230, Phone: (410) 706-5389, Email: bstuart@rx.umaryland.edu

Research Objective: The complex design of the Medicare Part D drug benefit raises the question of how beneficiaries react when faced with cost sharing that changes with the level of prescription spending, particularly the large gap in coverage known as the doughnut hole. Our first aim is to determine if actuarially equivalent but structurally different cost sharing arrangements have similar effects on beneficiary prescription drug utilization patterns. Our second aim is to determine if the relationship between use and benefit structure is sensitive to the overall generosity of insurance coverage.
Study Design: The study pools data from the 1998-2003 MCBS to construct matched cohorts of beneficiaries with continuous and discontinuous prescription benefits stratified into deciles of generosity defined as the proportion of total prescription spending paid by third parties. The unit of analysis is the person year. Matching within generosity decile is accomplished using propensity scores from regressions including extensive demographic, economic, and health status variables. Regression analysis using robust estimators is employed to test the independent effect of coverage gaps in a full-population model and separate models by generosity decile. Two-stage residual inclusion IV models are used to test for residual confounding in continuity of coverage.
Population Studied: Community-dwelling Medicare beneficiaries in the 1998-2003 MCBS surveys (78,125 person years).
Principle Findings: The study sample comprised 71% of the sample frame with prescription coverage (55,446 person years); 83% continuous and 17% with coverage gaps (mean gap=5 months). 93% of the person/year observations had positive prescription spending with an average generosity of 64%. For those with discontinuous coverage, mean generosity levels were negatively correlated to gap length. Preliminary regression models show strong positive impacts of generosity and continuity of coverage on prescription spending. The impact of coverage gaps becomes insignificant in the presence of generosity. The decile specific analyses are in progress.
Conclusions: Based on preliminary findings it appears that coverage gaps have no independent impact on prescription spending over and above the fact that gaps lower effective generosity levels.
Implications for Policy, Practice or Delivery: If the preliminary findings hold, it would suggest that benefit design features of the standard Part D benefit (the doughnut hole in particular) may be a less important determinant of demand than the average generosity of plan coverage.
Funding Source: RWJF

▪ How Elastic is Demand for Medicare Part D Plans

Kosali Simon, Ph.D.

Presented By: Kosali Simon, Ph.D., Assistant Professor, Policy Analysis and Management, Cornell University, 106 MVR Hall, Ithaca, NY 14853, Phone: (607) 255-7103, Fax: (607) 255-4071, Email: kis6@cornell.edu

Research Objective: To provide information on how seniors valued different attributes (including price) of Medicare Part D stand-alone plans in 2006 as revealed by their purchasing behavior. Our paper uses econometric techniques that allow us to make inferences on the distribution of preferences over attributes (and ultimately Medicare plans) by fitting a structural model of individual purchase probabilities to the aggregate market shares observed in the data.
Study Design: We aim to estimate a structural model of demand for Part D plans in 2006 based on discrete choice theory in a case when only aggregate data on sales are available (eg Berry 1995). There is no currently available survey that contains data on individuals and their choice of Part D plans. However, CMS has released data on aggregate enrollment into different plans. We use data on plan characteristics as well as the number of buyers (enrollment data for 2006) for the 1429 total stand alone plans that were sold in 34 geographically distinct markets by 70 unique insurers. Plan characteristics include the monthly premium, deductible, covered services (whether there is donuthole coverage, average prices for a basket of goods, use of prior authorization and step therapy etc). We also include insurer fixed effects to partially control for unobserved quality.
Since the enrollment data released by CMS includes both voluntary buyers as well as those who have been automatically assigned to the plan (dual eligibles, into certain plans), we produce estimates under different assumptions about the distribution of the non-voluntary enrollees across plans. Another issue that we address in the paper is the premium subsidies that change the price seen by certain customers (akin to price variation in other markets due to the choice of retail outlet etc).
Population Studied: Medicare recipients who chose stand-alone Part D plans in 2006. Data come from CMS (publicly released data as well as prices obtained from repeated querying of the plan finder tool).
Principle Findings: Of the 1415 plans with at least 10 enrollees in 2006, the average number enrolled was 10,932. When no other plan characteristics are used as controls, the elasticity of enrollment with respect to premiums is -3.12, implying that a one percent rise in premiums would decrease enrollment by 3 percent. When limited to actuarially equivalent plans, the elasticity of enrollment with respect to premiums is even higher at -3.82.
Conclusions: This preliminary evidence suggests that seniors were very sensitive to premiums in their choice of plans. In work underway, we refine this estimate to understand the importance seniors place on non-premium characteristics of the different plans.
Implications for Policy, Practice or Delivery: Understanding the way that the nation's seniors decided between the vast number of choices offered to them is of high policy significance as congress considers changes to the array of choices offered. By using econometric techniques, we are able to make inferences about the distribution of references of heterogeneous seniors using currently available aggregate data that will guide current policy decisions about the value of choice in the Part D market.

▪ Should Medicare Limit the Number of Drug Plans Offered to Seniors?

Janet Cummings, B.A., Tom Rice, Ph.D., Yaniv Hanoch, Ph.D.

Presented By: Janet Cummings, B.A., Graduate Student Researcher, Health Services, UCLA School of Public Health, 401 S. Barrington Avenue, Apt 224, Los Angeles, CA 90049, Phone: (310) 440-8852, Email: jrc12@ucla.edu

Research Objective: Passage of Part D of Medicare resulted in a new product: a stand-alone prescription drug insurance policy. In 2007, more than 50 plans are available in each state. In contrast, employees have only a handful of health insurance choices: just 20% of have more than five. Economic theory posits that more choice unambiguously benefits consumers, allowing for utility maximization and price competition. Psychologists have argued that more choice can increase motivation and improve psychological well-being. But some recent research finds that information overload can reduce the quality of choices made, and induce regret afterwards. Seniors, who often experience reduced cognitive abilities, are especially susceptible – although little research has been conducted. We examine whether: (a)

seniors prefer a large number of Medicare drug plan choices, or rather, that Medicare offer a select number of plans; and (b) the determinants of their belief. We hypothesize that those who can navigate through a larger array of choices – younger seniors, better educated, higher income, married – will prefer more choice. We also examine the impact of political beliefs on desire for more choice.
Study Design: Data come from a nationally representative telephone survey of 718 seniors age 65+ conducted in November 2006 by the Kaiser Family Foundation and Harvard School of Public Health. Seniors were asked which statement they agreed with more: (a) Medicare should offer dozens of drug plans, or (b) Medicare should select a handful of drug plans. We estimate logistic regressions to identify factors associated with a preference for more drug plans, controlling for demographic and other characteristics.
Population Studied: Our sample consists of 635 seniors, after dropping 65 individuals who had missing values on the dependent and 18 with missing values on independent variables.
Principle Findings: Only one-third of respondents (33%) agreed with the statement that Medicare should offer seniors dozens, as opposed to a handful, of drug plans. In multivariate logistic regression, those 75+ years were less likely to prefer more drug plans (not quite statistically significant, ß = -0.29, p=0.12). Education was significantly associated with a preference for more drug plans, but in an unexpected direction. Relative to those without a high school degree, those graduating high school (ß = -0.72, p=0.02) and college (ß = -0.81., p=0.01) were less likely to prefer more plans. Income and marital status were not statistically significant. In a second model, we added a variable for political beliefs, and found that individuals who identify themselves as moderates (ß = -0.46., p=0.03) and liberals (ß = -0.50, p=0.07) were significantly less likely to prefer more plans.
Conclusions: A significant majority of seniors would prefer that Medicare offer a handful of drug plans. Our results do not support our hypothesis that those with the greatest ability to deal with more choice would prefer that Medicare offer more plans.
Implications for Policy, Practice or Delivery: We will examine the advantages and disadvantages of Medicare adopting a policy similar to employers, ways to winnow down the number of choices, and give examples of other programs where this has taken place and their successes and failures.
Funding Source: RWJF

- **Nothing for Something: Paying Twice for Drug Coverage in Medicare**

Steven Pizer, Ph.D., Austin B. Frakt, Ph.D., Roger Feldman, Ph.D.

Presented By: Steven Pizer, Ph.D., Economist, Health Care Financing & Economics, VA & Boston University, 150 S. Huntington Avenue Mail Stop 152H, Boston, MA 02130, Phone: (857) 364-6061, Fax: (857) 364-4511,
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Research Objective: To compare the value of improved coverage for outpatient prescription drugs in Medicare with the value of increased health plan variety. The Medicare Modernization Act of 2003 expanded Medicare in both directions by creating a new stand-alone outpatient prescription drug benefit while simultaneously increasing the variety of choices available by raising payments to Medicare HMOs and inducing additional market entry.
Study Design: We estimate a statistical model of plan choice and use it to predict changes in consumer surplus arising along each expansion path. First, holding average coverage constant, we compare the value of an additional HMO choice to the expense of inducing market entry. Second, we examine the value and cost of new outpatient drug coverage provided through a single plan. To produce estimates of consumer surplus, we estimate a nested logit model of plan choice among Medicare HMOs, individually purchased Medicare supplements, and traditional fee-for-service Medicare. We modify the data to reflect marginal expansions along each path and calculate changes in consumer surplus. To estimate the cost of induced entry we use an ordered probit model of market entry based on county-level data from counties with Medicare HMOs.
Population Studied: Elderly Medicare beneficiaries not enrolled in Medicaid or employer-sponsored Medicare supplements. We combine administrative data from CMS with data from the Area Resource File and the Cost and Use files of the Medicare Current Beneficiary Survey from 1998 through 2001.
Principle Findings: We find that the addition of new outpatient drug coverage produced more than five times as much consumer surplus per public dollar than the inducement of additional HMO entry.

Conclusions: Although increased payments to Medicare HMOs succeeded in inducing market entry and the expansion of choices for beneficiaries, these choices provided much less value per public dollar than the creation of previously unavailable stand-alone drug insurance plans, particularly in counties where HMOs had not been available previously.
Implications for Policy, Practice or Delivery: The Medicare Modernization Act delivered a new outpatient prescription drug benefit through several alternative channels including existing Medicare HMOs, regional PPOs, stand-alone drug plans, and others. This research shows that of the plan types that attracted enrollment on a large scale, stand-alone plans delivered value to beneficiaries more cost-effectively than new HMOs. This implies that a portion of payments to HMOs could be reallocated within the program without reducing the total value of benefits available to beneficiaries.
Funding Source: RWJF, Department of Veterans Affairs

- Variation in Medicare Part D Prescription Drug Plan Benefits and Premiums

Leslie Greenwald, Ph.D., John Kautter, Ph.D., Greg Pope, M.S., Nathan West, M.A.

Presented By: Leslie Greenwald, Ph.D., Principal Scientist, RTI International, 5104 Wetheredsville Road, Baltimore, MD 21207, Phone: (410) 448-2611, Email: lgreenwald@rti.org

Research Objective: To understand how the multitude of Medicare Part D benefits and premiums differ on key elements. We compared benefits and premiums of stand alone prescription drug plans (PDP) and Medicare Advantage plans (MA-PDPs), as well as among the multiple different benefit standard models (basic and enhanced) allowed under the MMA.
Study Design: This study investigated how Medicare Part D prescription drug benefits and premiums differed between plans offered by stand alone PDP and Medicare Advantage Prescription Drug Plans (MA-PDPs). Then, within these PDP and Medicare Advantage plans, we compared benefits and premiums among the different basic and enhanced products available to beneficiaries in 2006. Benefit and premium data analyzed were available from the Centers for Medicare and Medicaid Services (CMS) website and from the CMS Health Plan Management System (HPMS). Benefit variables analyzed included total premiums for Part D, other cost sharing, pharmacy network and formulary management. Interpretation of the analysis was aided from the findings of a discussions we conducted with many private insurers.
Population Studied: Medicare Medicare Part D stand alone PDPs and MA-PDPs
Principle Findings: On average nationwide, beneficiaries in 2006 were able to get either basic or enhanced Medicare Part D benefits less expensively in conjunction with enrollment in a MA-PDP, compared to average costs had they elected a stand alone PDP. Medicare Advantage Health Maintenance Organization (HMO) plans, compared to Preferred Provider Organization (PPO) and Private Fee For Service (PFFS) plans, offered on average the lowest Part D premiums. This aggregate finding is likely based on the fact that Medicare Advantage plans, in determining their Medicare Part D premium, are able to use "savings" from the Medicare Part A and B sides to subsidize Part D. Among basic alternative and enhanced plans, Medicare Advantage products also tended to offer somewhat lower deductibles and higher initial coverage limitations. Stand alone PDPs and MA-PDPs were both more likely to use co-payments rather than coinsurance as a cost sharing for specific drugs. For both basic and enhanced products, MA-PDPs divided their covered drugs into more cost sharing drug tiers than PDPs. We did find that stand alone PDP plans tend to have slightly large pharmacy networks, though network size is generally very large among all plans and is therefore not a likely source of meaningful differences among plans. Regarding their formularies, MA-PDPs appear to have more extensive coverage of drugs compared to PDPs. Finally, Medicare Advantage Part D plans were less likely to apply common formulary management techniques (such as prior authorization, step therapy and quantity limits).
Conclusions: : We found that, likely as a result of their ability to subsidize Part D benefits from savings available from their Medicare A and B products, Medicare Advantage Part D benefits can be less expensive for somewhat better benefits. Medicare Advantage plans also have the ability to directly influence and potentially manage all health care services for beneficiaries, including physician prescribing patterns – an ability not available to stand alone PDPs. This difference may also influence the relative costs and benefits offered by Medicare Advantage versus PDPs.
Implications for Policy, Practice or Delivery: Medicare beneficiaries have a wide variety of plan choices for their Medicare Part D coverage.

Probably the biggest decision they must make is whether to received their Part D coverage from a stand alone PDP plan or in combination with enrollment in a Medicare Advantage plan. However, enrollment in a Medicare Advantage product is a significant decision for beneficiaries, and one which may not be influenced only be modest differences in costs and benefits.
Funding Source: RTI International

Issues in Medicare Reform

Chair: Jeffrey Stensland, Ph.D.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

▪ Pay-for-Performance in Medicare: Who Gets Paid?

John Kautter, Ph.D., Gregory C. Pope, M.S., Michael Trisolini, Ph.D.

Presented By: John Kautter, Ph.D., Senior Economist, Health Care Financing & Payment, RTI International, 1440 Main Street, Suite 310, Waltahm, MA 02451-1623, Phone: (781) 434-1723, Fax: (781) 434-1701, Email: jkautter@rti.org

Research Objective: High quality and efficient health care is an important priority for the Medicare program. A promising approach to achieve these goals is pay-for-performance. We develop and evaluate patient attribution methods for Medicare pay-for-performance, and apply our results to Medicare's first pay-for-performance initiative for physicians.
Study Design: Secondary data analysis of alternative patient attribution methods was conducted using multiple years of historical data on several large physician organizations. Characteristics of assignment methodologies that we examined included the type of services provided by the organization to a beneficiary, the share of a beneficiary's utilization provided by an organization, and the specialty of provider treating the beneficiary. The secondary data analysis was supplemented with physician interviews. We evaluated the alternative assignment methodologies on two criteria: provider responsibility and sample size.
Population Studied: Ten large physician organizations serving Medicare fee-for-service beneficiaries over the time period 2003-2005.
Principle Findings: Our findings showed that the patient attribution method that performed best on our evaluation criteria was the method of assigning a beneficiary to a physician organization if it provides the largest share, i.e., the plurality, of outpatient evaluation and management (E&M) services to the beneficiary during a time period. The assignment methodology incorporates outpatient E&M services provided by specialists as well as by primary care physicians. While alternative assignment methodologies performed better on our provider responsibility criterion or on our sample size criterion, none of the alternative assignment methodologies performed better on both criteria. For this assignment methodology, our findings showed that (1) about 50 percent of beneficiaries that were provided at least one Part B physician service by the organization during a year were assigned to the organization, with primary care oriented groups having more patients assigned; (2) around 50 to 70 percent of beneficiaries that received at least one outpatient E&M service from the organization during a year were assigned to the provider; (3) organizations provided approximately 80 to 90 percent of the outpatient E&M services of their assigned beneficiaries; and, (4) organizations generally retain about two-thirds of their assigned beneficiaries from one year to the next.
Conclusions: We develop a valid and operationally feasible method for the attribution of patients to large physician organizations serving Medicare fee-for-service beneficiaries. This patient attribution method performed best on our two evaluation criteria of provider responsibility and sample size. It is successfully being used in the Medicare Physician Group Practice Demonstration, which is Medicare's first pay-for-performance initiative for physicians.
Implications for Policy, Practice or Delivery: Medicare is exploring alternative approaches to improving the quality of care it pays for and controlling its costs. In the 1990s, managed care was a favored approach, but it has suffered a backlash in recent years. More recently, pay-for-performance has been considered a promising approach. A fundamental requirement for the success of Medicare pay-for-performance is patient attribution.
Funding Source: CMS

▪ Long-Term Trends in the Concentration of Medicare Expenditures

Gerald Riley, M.S.P.H.

Presented By: Gerald Riley, M.S.P.H., Senior researcher, Office of Research, Development, and Information, Centers for Medicare and Medicaid Services, 7500 Security Boulevard, Mail stop C3-20-17, Baltimore, MD 21045, Phone: (410) 786-6699, Fax: (410) 786-5534,

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Research Objective: The concentration of Medicare expenditures among a small number of beneficiaries is well documented. Changes in degree of concentration may alter the potential impact of cost reduction efforts targeted to the most expensive beneficiaries. This study describes long term trends in the concentration of Medicare expenditures, including changes in the mix of services used by high cost individuals, the characteristics of high cost individuals, and the persistence of high costs from year to year.
Study Design: The study used the Continuous Medicare History Sample (CMHS) file, which contains longitudinal data covering a thirty year period for a five percent sample of the Medicare population. The file contains summary cost and utilization data by calendar year. Data for 1975-2004 were analyzed, excluding data for 1998-2000, which were unavailable at the time of the study. Expenditure concentration was measured as the percent of Medicare costs attributable to the most expensive five percent of beneficiaries. In order to identify beneficiaries with specific chronic conditions, claims for physician services were extracted for the sample for 1995 and 2004.
Population Studied: The study population was Medicare beneficiaries entitled to Part A and Part B in fee-for-service. A 20 percent subsample of CMHS was used, representing a one percent sample of the Medicare population.
Principle Findings: The percent of annual Medicare expenditures attributable to the top five percent of beneficiaries decreased from 54.2 percent in 1975 to 43.0 percent in 2004. Over time, the percent of expenditures going to inpatient hospital services decreased, but did so to a smaller degree among the top five percent than among all beneficiaries. When aggregated over four year periods, expenditures became somewhat less concentrated over time (from 34.4 percent in 1975-1978 to 29.8 percent in 2001-2004). High cost beneficiaries tended to be dual eligibles, to be in their last year of life, and of black race; the percent of beneficiaries with various chronic conditions increased between 1995 and 2004 both overall and within the top five percent. At the person level, the persistence of high costs from one year to the next increased until the mid-1990's, then decreased slightly thereafter. The percent of decedents who were high cost in the year of death remained relatively stable (20-23 percent), but the percent with high costs in the three years before death generally increased.
Conclusions: Between 1975 and 2004, Medicare expenditures became less concentrated over time, although year-to-year persistence of high costs at the person level remained strong. There was an increase in the prevalence of several treated chronic conditions among high cost beneficiaries between 1995 and 2004. Explanations for these trends are likely multi-faceted, including increases in longevity, the use of expensive technologies on less sick patients, and the relative stability of the Part B deductible.
Implications for Policy, Practice or Delivery: The increase in prevalence of chronic conditions among high cost beneficiaries confirms the appropriateness of chronic disease-focused interventions for reducing Medicare costs. The decrease in concentration may reduce the potential savings from interventions focused on high cost beneficiaries, however.
Funding Source: CMS

- **Effect of Cost-Sharing on Screening Mammography in Medicare Managed Care Plans**

Amal Trivedi, M.D., M.P.H., William Rakowski, Ph.D., John Ayanian, M.D., M.P.P.

Presented By: Amal Trivedi, M.D., M.P.H., Assistant Professor, Community Health, Brown University, Box G, S121-6, Providence, RI 02912, Phone: (401) 270-7281,
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Research Objective: Increasing patients' share of health care expenses decreases discretionary health services use but also can reduce use of important preventive care. We examined the impact of modest cost-sharing on biennial breast cancer screening among women in Medicare managed care plans.
Study Design: We reviewed coverage for mammography within 174 Medicare health plans from 2001-04. We compared rates of biennial breast cancer screening within plans requiring >$10 copayment or >10% coinsurance for mammography with screening rates in plans with full coverage for this service. Using linear regression with GEE, we adjusted for race, area-level income, area-level education, Medicaid eligibility, census region, plan size, plan age, tax status, model type, year, and clustering by plan. We assessed whether the impact of copayments varied by income, education, Medicaid eligibility and race by assessing the significance of interaction terms with cost-sharing status. We compared the change in mammography rates of 7 health plans that instituted cost-sharing in

2003 to a control group of plans with continuous participation in Medicare from 2002 to 2004 that did not institute cost-sharing.
Population Studied: 550,082 individual-level observations from women ages 65-69 enrolled in 174 Medicare health plans from 2002-04.
Principle Findings: The number of Medicare plans with cost-sharing for mammography increased from 3 in 2001 (representing 0.5% of women) to 21 in 2004 (11.4% of women). The median copayment was $20 (range $13-$35); five plans required 20%coinsurance. Across all study years, rates of breast cancer screening were 77.5% in plans with full coverage and 69.2% in plans with cost-sharing. Differences in screening rates between cost-sharing and full coverage plans ranged from 8% to 11% during each year. In multivariate analyses, the presence of cost-sharing was associated with a 7.2% (95%CI 4.6%-9.7%) lower adjusted rate of screening, an effect that was greater in magnitude than any other plan-level covariate in the model. The negative effect of cost-sharing on mammography rates was significantly greater for enrollees residing in less affluent and less educated areas and for enrollees with Medicaid eligibility (all p<0.001). Over time, mammography rates decreased by 5.5% in plans that instituted cost-sharing in 2003, compared to a 1.7% increase in screening rates in a comparison group of plans that did not institute cost-sharing, yielding a difference-in-difference of 7.2%. After adjustment for enrollee and plan characteristics, the difference-in-difference was 7.0% (95%CI 2.7%-11.3%).
Conclusions: Relatively small copayments for mammography are associated with significantly lower biennial mammography rates among woman who should receive breast cancer screening according to accepted clinical guidelines. The negative effect of cost-sharing was increased for vulnerable population groups.
Implications for Policy, Practice or Delivery: For important preventive services such as mammography, exempting the elderly from cost-sharing may be warranted.

- Mortality Effects of Health Insurance for the Near-Elderly Uninsured

Jose Escarce, M.D., Ph.D., Jalpa Doshi, Ph.D., Willard Manning, Ph.D., Jeannette Rogowski, Ph.D., Susan Paddock, Ph.D., Li Cen

Presented By: Jose Escarce, M.D., Ph.D., Professor of Medicine, Medicine, UCLA School of Medicine, 911 Broxton Avenue, Los Angeles, CA 90024, Phone: (310) 794-3842, Email: escarce@rand.org

Research Objective: About 25% of the near-elderly experience a period without health insurance at an age when reduced access to health care can lead to adverse health outcomes. Our objective is to estimate the effect of obtaining health insurance at age 65 through the Medicare program on mortality for the previously uninsured near-elderly.
Study Design: We used the 1992-2004 waves of the Health and Retirement Study (HRS), a biannual panel survey of a nationally representative cohort of individuals who were 51 to 61 years old in 1992. Our study sample included all primary respondents and spouses who were aged 59/60 in the 1992 to 1996 waves with exclusions for those with Medicare or Medicaid insurance at that age. We employed a quasi-experimental design in which we compare trends in mortality rates before and after age 65 for those who were insured prior to age 65 and for those who were uninsured prior to age 65 (defined as persons lacking health insurance at age 59/60). Specifically, we estimated Cox regression models to compare the hazard of mortality in the pre-65 insured group and in the pre-65 uninsured group, with a time dependent explanatory variable to capture the transition to Medicare. The time dependent Medicare variable was interacted with the pre-65 insurance status indicator variable. The dependent variable was time to death with censoring for those who were lost to follow-up or still alive in the 2004 wave. The models controlled for age, initial health status, sex, race, education, marital status, and region.

Population Studied: Our study sample included all primary respondents and spouses who were aged 59/60 in the 1992 to 1996 waves with exclusions for those with Medicare or Medicaid insurance at that age. The final sample included 4,075 individuals who were followed from age 59/60 until death, loss to follow up, or the end of the study period (i.e. 2004 wave).
Principle Findings: The mortality rate was significantly higher for the pre-65 uninsured than for the pre-65 insured (hazard ratio=1.49; 95% CI, 1.10-2.02, p=0.01). Further, the introduction of Medicare at age 65 did not alter this hazard ratio.
Conclusions: The near-elderly uninsured have higher mortality than their insured counterparts, other things being equal, and the introduction of Medicare insurance at age 65 does not narrow the gap in mortality rates.

Implications for Policy, Practice or Delivery: The cross-sectional estimate of higher mortality among the near-elderly uninsured may reflect an insurance system that makes it difficult for those in poor health to obtain insurance. Whatever the reason for being uninsured before age 65, our results suggest that age 65 is too late to substantially change mortality risk by providing insurance.
Funding Source: NIA

▪ The Incidence of Medicare Payment Reductions: Evidence from Balanced Budget Act of 1997
Vivian Wu, Ph.D.

Presented By: Vivian Wu, Ph.D., Assistant Professor, School of Policy Planning and Development, University of Southern California, 650 Childs Way, RGL 305, Los Angeles, CA 90089-0626, Phone: (213) 740-6526, Fax: (213) 740-1801, Email: vivianwu@usc.edu

Research Objective: To estimate the degree to which the loss of Medicare revenues was compensated by induced higher private payments, and how hospitals' ownership and competitive environment interact with such behavior.
Study Design: Using a natural experiment generated by the Balanced Budget Act (BBA) of 1997, I estimate a first-difference model to test how prices for privately insured are affected by exogenous Medicare revenue loss due to BBA.
Population Studied: All the short-term general hospitals operated in the US between 1996 and 2000.
Principle Findings: I estimate that urban hospitals were able to offset Medicare revenue cuts 78 cents per dollar by raising payments to private payers within three years following the Act. Most (85%) of the increased revenues come from higher per-diem prices rather than longer length-of-stay. Cost-shifting does not vary across individual hospitals by ownership type, but differs by market as a whole. Two market conditions - higher HMO activities and greater share of FP hospitals in the neighborhood - can limit the degree of cost shifting.
Conclusions: This study finds that the burden of BBA Medicare payment reductions was mostly shifted from hospitals to private payers in urban areas. Cost shifting does not differ by individual ownership type or teaching affiliation. Rather, hospitals of all types behave similarly within a market depending on the market conditions. Market power along does not explain well whether or how much a hospital will cost shift.
Implications for Policy, Practice or Delivery: First, the evidence of 78 percent cost shifting means that the seeming "savings" from provider payment cuts are equivalent to a tax levied on the working population. In addition, higher private prices must be financed through higher health insurance premiums, which can exacerbate the existing uninsured problem. This paper also demonstrates that although HMO penetration is high in the late 1990s, hospitals can still successfully raise prices when they need to. Therefore, the level of HMO penetration is no longer a good measure of the true level of market competitiveness. Lastly, because each current model explains some parts of the empirical findings, future research is needed to incorporate the need, ability, and constraints (such as joint cost/quality) to cost shift in a bargaining framework in order to better understand the complex dynamic pricing behavior.
Funding Source: AHRQ

Population & Public Health

Building Collaborations to Address Population Health

Chair: L. Michele Issel, Ph.D., R.N.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ Innovative Planning & Evaluation Methods for Multi-Organizational Public Health Systems
Margaret Hargreaves, M.P.P., Ph.D.

Presented By: Margaret Hargreaves, M.P.P., Ph.D., Senior Associate, Domestic Health Division, Abt Associates, 55 Wheeler Street, Cambridge, MA 02138, Phone: (617) 349-2479, Email: meg_hargreaves@abtassoc.com

Research Objective: To develop and test new planning and evaluation methods that combine complex adaptive systems (CAS) theory and the social-ecological model (SEM), in multi-level public health system initiatives. The lead presenter developed CASE planning and evaluation methods in her doctoral program, and has been using and refining the methods in planning and evaluation projects at the local, state, and national level.

Study Design: Case studies of the use of new CASE (Complex Adaptive Social-Ecological) methods in evaluations of three projects: 1) the Minnesota Health Care Disparities Task Force, 2) CMS (Centers for Medicare and Medicaid Services) Real Choice Systems Transformation Grants, and 3) The Children's Trust's Health Connect in Our Schools Initiative in Miami-Dade County, Florida. Each case study describes the overall purpose and design of the specific systems initiative, the innovate CASE planning and evaluation methods used to evaluate the structure, process, and (preliminary)impact of the initiative, and the implications of the choice of CASE methods on the design, process, findings, and use of the evaluation.
Population Studied: The three public health system initatives served different populations. The Minnesota Health Care Disparities Project was a project co-lead by the Minnesota Department of Health's Office of Minority Health and the Minnesota Department of Health and Human Services. The Task Force included leaders from the state's health care industry, including health care systems, HMO's, public and private health insurance providers, safety net hospitals and provider associations. The case study looked at how CASE methods were used to help the Task Force plan and implement a statewide effort to improve the cultural competence of health care for all Minnesotans. The second case study looks at how CASE methods were used to provide technical assistance to help 18 state grantees develop strategic plans and evaluation plans for statewide grant efforts to transform and rebalance the states' long-term care systems from a focus on institutional-based care to home and community-based care. The third case study looks at how CASE methods were used to frame and implement a formative evaluation of the Health Connect in Our Schools Initiative in 101 schools in Miami-Dade County.
Principle Findings: In each case, CASE methods were used to reframe the system initative, not as a linear change process, but as a dynamic multi-level, multi-sector change process (based on the SEM model) involving a complex adaptive system of interdependent organizations and agents (based on CAS theory). This reframing led to new research questions and data collection strategies, looking at the content and interaction of changes across different levels (parts, wholes, and greater wholes) and sectors (using more participatory, interactive methods). CASE methods were also used to modify the presentation and dissemination of the evaluation findings.
Conclusions: The CASE methods were innovative, and did change population health planning and evaluation practice.
Implications for Policy, Practice or Delivery: The CASE methods are important new tools for improving the planning and evaluation of public health system initiatives.

- Evaluation of Alliance for a Healthy Border, A Diabetes and Cardiovascular Disease Prevention Program

Cynthia Brown, Ph.D., José A. Pagán, Ph.D., Suad Ghaddar, Ph.D.

Presented By: Cynthia Brown, Ph.D., Associate Professor, Economics and Finance, University of Texas-Pan American, 1201 W. University Drive, Edinburg, TX 78541, Phone: (956) 381-2825, Fax: (956) 384-5020, Email: cjbrown@panam.edu

Research Objective: The objective of this research is to evaluate Alliance for a Healthy Border, a diabetes and cardiovascular disease prevention program sponsored by Pfizer Inc, which targets the high incidence of diabetes and heart disease among the largely Hispanic population residing in US-Mexico border communities. Educational prevention programs at three federally-qualified community health centers located along the border in Texas and California are evaluated in order to determine whether these programs influence individuals' behaviors, which in turn result in improved health outcomes. Program evaluations will ultimately help identify best practices in diabetes and cardiovascular disease prevention programs that serve the Hispanic population.
Study Design: A pre-post study design is employed. Participants are recruited into the programs through promotions at health fairs, flyers at clinics, provider referrals, and word of mouth. Participants then partake in interactive class sessions on chronic disease prevention, nutrition, and physical activity. The sessions are facilitated by promotoras (community health workers) and the content is adopted with some modifications from well established culturally appropriate health curriculums such as Pasos Adelante (Steps Forward). Program duration ranges from 9 to 12 weeks. Evaluations are conducted by administering pre- and post-intervention surveys based on CDC's Behavioral Risk Factor Surveillance System and the Community Tracking Study Household Survey. Pre- and post-program clinical health outcomes

and anthropometric measures (weight, waist to hip ratio, heart rate, blood pressure, glucose, HbA1c, and cholesterol) are also collected. Current sample size is at 65 each for centers in Webb and Maverick counties in Texas and 28 at the third center in Imperial County, California.
Population Studied: Hispanic communities along the U.S.-Mexico border
Principle Findings: Using the paired samples t test, the Wilcoxon matched-pairs signed-ranks test and the McNemar test, significant changes were detected for almost all of the variables measuring dietary and physical activity behavior: consumption frequency of fruits and vegetables, healthy eating habits scale, engagement in physical activity and the frequency of participating in moderate physical activity. Further objectives of this research include whether these behavioral changes are sustainable in the long run and whether they will translate into changes in clinical outcome measures known to be associated with diabetes and cardiovascular disease such as the body mass index, cardiac risk factor index, hip-to-waist ratio and blood sugar measures of fasting glucose and HbA1c. This will be achieved by complementing the analysis with 6-month follow-up surveys and clinical outcome measures post-intervention and at 6 months, all of which are currently underway.
Conclusions: Community based, culturally appropriate approaches to health education can result in healthier lifestyle habits in predominately Hispanic border communities.
Implications for Policy, Practice or Delivery: The high prevalence of diabetes and cardiovascular disease among Hispanics along the U.S.-Mexico border is an important challenge facing healthcare systems in border communities. Poor health outcomes can result in a health care crisis in these communities that already face high rates of poverty and uninsurance. The relatively lower cost of prevention programs and their effectiveness at influencing behavioral changes in dietary and physical activity habits underscores the importance of adopting, promoting and funding these types of interventions.
Funding Source: Pfizer, Inc.

- **Investigating the Effects of Private-Public Partnerships on Delivery of Public Health Services**

Sergey Sotnikov, Ph.D., Toby Merlin, M.D.

Presented By: Sergey Sotnikov, Ph.D., Economist, Division of Partnerships and Strategic Alliances, Centers for Disease Control and Prevention, 1600 Clifton Road M/S: E-73, Atlanta, GA 30333, Phone: (404)498-1116, Fax: (404)498-1112, Email: anno@cdc.gov

Research Objective: The recent report from Institute of Medicine (IOM), "The Future of the Public's Health in the 21st Century," promotes partnerships as an important way to improve public health. However, the evidence of the positive effects of partnerships on measurable public health outcomes is scarce. This study intends to provide quantitative evaluation of the effects of public-private partnerships on the number and the types of services provided by the local health departments (LHDs).
Study Design: Private-public partnerships can be viewed as organizational interventions aimed at improving the efficiency of public health service delivery. The gold standard of study design for quantification of the effects of interventions is randomized control trial (RCT). However, RCT is not feasible in the case of partnerships because partnering is a matter of choice, and, thus, random assignment of LHD into partner and non-partner groups is not possible. Partnership effects estimated without accounting for non-random selection will be biased. We use propensity-scores-matching methodology to conduct quasi-experimental assignment of LHDs into comparable pairs of cases and controls. Pscore routine in STATA9 is used to estimate a Probit model of business partners' choice as a function of observable characteristics (LHD expenditures, number of customers in jurisdiction, number of employees, the size of the jurisdiction). Predicted probabilities of having a business partner are used to match LHDs with and without business partners by nearest-neighbor-matching method. The effects of LHD private partnerships are estimated by calculating the difference in outcome variables for each pair and taking a mean of the differences. The outcomes are dichotomous variables indicating if any of the 36 services are provided by LHD and also the total number of services provided.
Population Studied: The main sources of data on LHD characteristics, partnerships, and types of 36 services provided by LHD is the 1996 NACCHO survey of 2793 LHD. The service types include: immunizations, animal control, behavioral health, child health, chronic disease prevention, communicable disease control, community assessment, dental heath, environmental health, family planning, HIV/AIDS, STD, TB, health education, home

care, injury control, inspections, lab services, mental, obstetrical, prenatal and maternal health, occupational health and safety, primary care, programs for homeless, school based health, substance abuse, tobacco prevention, and veterinarian services.
Principle Findings: LHDs that partner with businesses are more likely than LHDs that do not have business partners to deliver the following services: injury prevention (11.3% point difference, t=3.65), school health programs (7.6%, t=2.70), tobacco control (6.4%, t=2.38), and community assessment (5.3%, t=2.32). LHDs that cooperate with businesses tend to provide less obstetrical care (-6.2%, t=-2.00). No statistically significant effects (at 0.05 level) of public-private partnerships were observed for all other services as well as for the total number of services delivered.
Conclusions: This study suggests that LHD partnerships with businesses may have beneficial effects on injury prevention, school health programs, tobacco control, and community assessment.
Implications for Policy, Practice or Delivery: Promoting LHD partnerships with businesses may have heterogeneous effects on delivery of public health services, i.e. delivery of some services may improve more than others.
Funding Source: CDC

▪ PREPARE for Pandemic Influenza: A Pilot Learning Collaborative for Quality Improvement in Public Health Preparedness

Debra Lotstein, M.D., M.P.H., Jennifer Li, Ph.D., M.B.A., Karen Ricci, M.S.N., R.N., Divvie Powell, M.S.N., R.N., Peter Margolis, M.D., Ph.D., Nicole Lurie, M.D., M.S.H.S.

Presented By: Debra Lotstein, M.D., M.P.H., Health Services Researcher, Health, RAND Corporation, 1776 Main Street, M3W, Santa Monica, CA 90407, Phone: (310) 393-0411 x6076, Email: lotstein@rand.org

Research Objective: Many public health departments are seeking to improve their capabilities to respond to a large-scale event such as a pandemic influenza outbreak, but few are fully prepared to handle one. Widespread variability in performance among health departments suggests the need for systematic efforts to speed agencies' progress, whether or not a pandemic occurs. Quality improvement methodology provides a structured way to identify solutions to performance shortfalls, implement changes, and spread successful techniques. These critical techniques, which are based on proven business and management practices, have not been widely available to public health departments. To address this gap, we developed a pilot quality improvement collaborative, with the goals of developing a framework and set of QI tools for improving public health preparedness and using QI methodology to improve their preparedness.
Study Design: Our pilot collaborative focused strongly on innovation from each participating team, adapting the Breakthrough Series learning collaborative format from the Institute for Healthcare Improvement. With input from experts in the field, we defined a set of performance targets and ideas for improvement in each of five domains: Surveillance; Case Investigation; Command, Control and Communication; Risk Communication, and Disease Control and Treatment.
Population Studied: In early 2006, RAND recruited five local and state health departments recognized for their openness to advancing public health emergency preparedness. Each participating agency identified a team of 3-4 staff members who carried out the improvement activities. Each team selected one or two domains of preparedness to focus on, and together, they are working on: risk communication; disease control and treatment; and command, control, and communication. Within their chosen domain, each team identified an aim and objective performance measures to measure progress towards this aim. Sharing and learning about the QI methods occurred via three in-person meetings and monthly conference calls (occurring between May 2006-February 2007).
Principle Findings: Teams identified ways to map their preparedness processes into steps for testing and measurement. They were able to use these "process maps" to improve the efficacy and efficiency of their improvement work. Over the course of the collaborative teams found many opportunities to use day-to-day activities to test and improve their preparedness activities. Participants found that using rapid, small testing cycles (or PDSA cycles) was a valuable way to learn about their systems, and led to increased buy-in and confidence in particular preparedness improvement efforts. Many of the teams' QI activities fostered important partnerships, both within the agency and across their communities. Each of the participating teams made significant progress towards their aim. Participants were enthusiastic about the QI approach and

encouraged an extension of the collaborative work.
Conclusions: This is a promising model for improving public health preparedness and may be useful for improving public health performance overall.
Implications for Policy, Practice or Delivery: Ongoing efforts are needed to support QI in public health, including the identification of feasible performance measures and support for QI training. Leadership at local, state and federal levels is needed to encourage the robust implementation of QI in public health.
Funding Source: Department of Health and Human Services

- **The Six Degrees in Public Health Emergency Preparedness: Understanding How Local Agencies Collaborate in Rural Communities**

Margaret Wang, Ph.D., M.P.H., Aram Dobalian, Ph.D., J.D., Heather R. Rodriguez, Ph.D.

Presented By: Margaret Wang, Ph.D., M.P.H., Researcher, RAND, 1776 Main Street, Santa Monica, CA 90401, Phone: (310)393-0411 x6077, Fax: (310)260-8161, Email: mcywang@rand.org

Research Objective: Recent terrorist attacks have spurred numerous efforts to improve public health emergency preparedness. However, most of these efforts have concentrated on large, urban communities. Due to their limited access to health care compared to most urban areas, rural communities may be especially burdened by the longer-term health effects of natural and human-caused disasters. This study aims to determine the information exchange infrastructure and service referral patterns among health care and social service organizations in rural and small urban communities.
Study Design: Network relational data were collected through mailing surveys on: (1) frequency of communication and (2) referral relationships. These data were supplemented by qualitative information about both the organization and the respondent, collected through in-person interviews with administrators and providers (e.g., physicians and nurses) of each organization. Social network analyses were applied to determine the extent of information exchange and service referral patterns among these organizations.
Population Studied: Respondent organizations included three private outpatient clinics, three Florida Department of Health outpatient clinics, a behavioral health specialty clinic, and a local office of the American Read Cross in rural communities in Florida (response rate = 73%).
Principle Findings: Based on confirmed relational data collected from administrator respondents, the information exchange network density was 0.667, indicating that 66.7% of all possible communication ties were present in this network. An organization within this network had on average communication ties with four other organizations. The sociogram (i.e., a visual illustration of the relationships among respondent organizations) identified an urban county health department and a carve-out behavioral health provider as the most active communicators within the information exchange network, conferring with interview data. Univariate analyses on the network revealed that level of communication among county health departments was higher than among private organizations. Point connectivity analysis identified one county health clinic connected to the rest of the organizations in the network by only one other organization, making it particularly susceptible to be left out of the communication network during emergencies.
Conclusions: The central role played by the one urban county health department underscores the important functions nearby urban facilities provide to rural residents. Thus, a disaster that strikes an urban center may also have a significant impact on the health of rural residents even if the rural areas are not directly impacted by the disaster. The relative lack of communication between private agencies may reflect concerns that other private clinics are potential competitors, while county health facilities may view one another as complements. If correct, this is a potential concern for disaster response as private organizations may initially be reticent to communicate and interact with one another, leading to delays in responding to a disaster. Finally, this study demonstrates the utility of social network analysis as an additional analytic tool to examine the underlying information exchange network among local health agencies in rural communities.
Implications for Policy, Practice or Delivery: Effective disaster response requires numerous organizations to communicate and interact with one another. If these ties are not established before a disaster strikes, the impact of a disaster may be more geographically dispersed than anticipated.
Funding Source: AHRQ

Organizational Responses to Population Health Issues

Chair: Neal Wallace

Monday, June 4 • 2:30 p.m.-4:00 p.m.

▪ State Public Health Law Modernization: Assessing the Impact of the Turning Point Model State Public Health Act

Benjamin Mason Meier, J.D., L.L.M., M.Phil, Kristine M. Gebbie, R.N., Dr.P.H., James G. Hodge, Jr., J.D., L.L.M.

Presented By: Benjamin Mason Meier, J.D., L.L.M., M.Phil, Program Manager, Columbia University, Center for Health Policy, 617 West 168th Street, New York, NY 10032,Phone: (212) 305-0047, Fax: (212) 305-3659, Email: bmm2102@columbia.edu

Research Objective: To identify the processes used by states seeking to modernize state public health laws and programs pursuant to the Turning Point Model State Public Health Act and analyze the major variables associated with the success or failure of these modernization efforts.
Study Design: The 2003 Turning Point Act provides a comprehensive template for states interested in public health law reform and modernization. This project documents and compares the modernization of state public health statutes subsequent to the Turning Point Act, focusing on a range of case study outcomes illustrative of uses of the model act. Semi-structured key informant interviews explored (1) the role of the informant in the legal/regulatory changes, (2) the public health problems addressed by the changes, (3) the obstacles to changes in state law and the strategies used to overcome these obstacles, (4) subsequent changes in public health regulation, organization or programs, and (5) the expected changes in health outcomes. Comparing the results of each state, this study analyzes those factors that influence the success or failure of public health law reform legislation.
Population Studied: States were selected for the comparative case studies (Alaska, Nebraska, South Carolina, and Wisconsin) based upon their consideration of changes in public health legislation, region of the country, and public health system structures. In each state, key informants (including public health officials, legislators or legislative staff, executive policy staff, and representatives of health-related advocacy or lobbying groups) were identified and interviewed based upon their participation in the reform process.
Principle Findings: This comparative project has identified key policy participants and partnerships, areas of policy contention, and efforts to overcome obstacles to reform. Examining the themes associated with the success or failure of modernization legislation, a process model for law reform was developed for each state, delineating each reform effort by its (1) utilization of the Turning Point Act, (2) development of draft law, and (3) legislative action.
Conclusions: Conclusions based upon this comparative case study analysis demonstrate how (1) the Turning Point Act is codified into state law, (2) state actors pursue public health legislative reform, and (3) modernized state laws influence or change the public health system, leading to improved health outcomes. Comparing the dominant forces, key actors, and results at each stage of reform, this analysis concludes that key features in the role of law (e.g., completion of a formal gap analysis) and politics (e.g., presence of a legislative champion or opponent) are instrumental to the success or failure of public health law modernization.
Implications for Policy, Practice or Delivery: This project provides public health practitioners, policy-makers, and scholars with improved resources to support their efforts, facilitating successful modernization of public health statutes across the country. Its conclusions have created a framework for ongoing data collection and analysis on the relationship between law and public health. Addressing a gap in scholarship on the role of law and policy for enhancing public health infrastructure and performance, this research provides a meaningful set of academic materials for institutions responding to the IOM call for greater inclusion of law and politics in public health curricula.
Funding Source: RWJF

▪ Developing an Evidence-Based Typology of Public Health Systems: A Qualitative Analysis

F. Douglas Scutchfield, M.D., Michelyn Bhandari, Dr.P.H., M.P.H., Nikki Lawhorn, M.P.P., Ashley McCarty, B.S., Glen Mays, Ph.D., M.P.H., Sharla Smith, M.P.H.

Presented By: F. Douglas Scutchfield, M.D., Peter P Bosomworth Professor of Health Services Research and Policy, Health Services Management, University of Kentucky College of Public Health, 121 Washington Avenue, Room

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Research Objective: Utilizing the typology of public health systems structure and composition identified in the quantitative phase of this study, this qualitative phase seeks to build on those findings by 1) Gathering information on how different types of local health departments allocate public health responsibilities and resources among key governmental and nongovernmental actors; 2) Identify the political, economic, institutional, and socio-cultural forces that shape the structure and operation of public health delivery systems; 3) Assess how system structure and composition influences the availability and effectiveness of essential public health services in states and communities.
Study Design: The qualitative phase of this study is based on findings from a longitudinal survey of local public health department directors conducted in 1998 and 2006. The surveys assessed local public health systems composition, coordination, and performance with respect to the twenty core public health activities. Survey data were also linked with secondary data on local public health department characteristics and resources obtained from the 1997 and 2005 NACCHO National Profiles of Local Health Departments. Hierarchical cluster analysis was used to group local public health agencies into seven clusters based on their composite system typology score. The seven clusters represent the relative strengths and weakness of agencies across three domains: differentiation, integration, and centralization.
Population Studied: Two agencies were selected from each of the seven clusters to participate in qualitative interviews designed to further examine quantitative findings. Of the two agencies selected from each cluster, one agency represents an agency that had a stable composite score between 1998 and 2006; the second represents an agency that had a change in their composite score.
Principle Findings: The quantitative phase of the study found increases in both the availability and perceived effectiveness of core public health activities. This phase of the study explores the underlying drivers of change including the role of assessment activities and increased funding and whether observed changes are real or perceived. The quantitative findings also suggested a change in the degree of interaction/contribution of organizational partners since 1998. The qualitative phase of the study identifies the array of organizations contributing to local public health activities and explores the nature and intensity of interaction among the major organizational participants including the barriers and facilitators that affect interaction with other contributors across the following areas: political/governmental, policy/programmatic, economic, institutional/organizational culture, leadership characteristics/style, population health needs, risks, and geographic/proximity. Findings on the impact of this interaction on overall system performance will be presented.
Conclusions: The results of this study will suggest how to improve the performance of local health departments. Using knowledge gained from this research, the organization, resources, and management of public health systems can be improved.
Implications for Policy, Practice or Delivery: In-depth analysis of individual organizations within each cluster of the public health system typology will increase understanding of the different approaches local health departments use to organize and deliver public health services. These findings will enable policymakers and key stakeholders to understand the relative strengths and weaknesses of these alternative approaches and the political, economic, and institutional contexts in which these approaches appear to function best.
Funding Source: RWJF

- Pandemic Influenza Preparedness in County Health Departments

George Avery, Ph.D., M.P.A., Dave McKinnis, Ph.D., Pamela Altonen, M.S., R.N., George Avery, Ph.D., M.P.A., Deborah Koester, M.S.N.

Presented By: George Avery, Ph.D., M.P.A., Assistant Professor, Health and Kinesiology, Purdue University, 800 W Stadium Avenue, West Lafayette, IN 47907, Phone: (765) 496-3330, Fax: (765) 496-1239, Email: gavery@purdue.edu

Research Objective: This study was designed to analyze pandemic flu planning gaps for all 94 local health departments (LHD) in Indiana.
Study Design: In April 2006, each LHD completed a self-assessment designed by the Centers for Disease Control and Prevention. In May 2006, Purdue received these self-assessments as a starting point for the gap analysis procedure, which was designed by the Purdue team. This procedure consisted of two steps: (1) designing an auditing tool and completing a conference call or site visit with

each LHD, and (2) development of a final gap report for each LHD.
Population Studied: The study population consisted of 94 local (county or municipal level) health departments in each of 92 Indiana counties.
Principle Findings: Strengths identified across LHDs include: 1) a clear understanding of the roles of the LHD, LHO, and EMA in pandemic planning and response, 2) identification of local healthcare resources and psychosocial services for pandemic response, 3) memos of understanding (MOU) in place for points of distribution (POD), mutual aid and support of supplies and volunteers, and 4) on-going work to complete written plans and ensure flexibility. Significant gaps include 1) alternate care site planning, 2) volunteer management, 3) mass fatality planning, 4) public and business education and involvement in LHD planning, 5) identification of homebound or special needs populations, 6) integration of key stakeholders and delineation of roles in LHD plans, 7) identification of priority groups for vaccination and anti-viral, 8) awareness of routine surveillance for seasonal influenza at the local level by planning coordinators, 9) PPE acquisition and management, 10) planning or consensus on isolation/quarantine procedures for implementation, and 11) depth in plans for continuing operation, particularly with regard to the local health officer.
Conclusions: Although strengths in planning are observed, significant gaps remain between CDC-identified capabilities and the planning efforts by local health departments and public health partners.
Implications for Policy, Practice or Delivery: Significant gaps remain between necessary planning and capability to manage an influenza pandemic and existing capabilities.
Funding Source: Indiana State Department of Health

- Statutory Impediments to Implementation of the 2006 CDC Recommendations for HIV Testing in Healthcare Settings

Anish Mahajan, M.D., M.P.H.

Presented By: Anish Mahajan, M.D., M.P.H., Clinical Scholar, UCLA Department of Internal Medicine, UCLA-Robert Wood Johnson Clinical Scholars Program, 911 Broxton Plaza, Suite 317, Los Angeles, CA 90024, Phone: (310) 270-6134, Email: AnishMahajan@mednet.ucla.edu

Research Objective: About 300,000 persons in the U.S. are unaware of their HIV seropositivity. The existing paradigm for HIV testing, requiring informed consent and prevention counseling, has hampered uptake of testing and early detection. As a result, the CDC in September 2006 recommended a major revision to testing policy – 'opt-out' HIV screening of all patients in all health-care settings. In 'opt-out' testing, the provider notifies the patient that HIV testing will be performed and offers the patient the opportunity to decline. The objective of this paper is to critically examine existing state-level law regarding HIV testing that may limit full implementation of the new CDC recommendations.
Study Design: Novel provisions of the 2006 CDC Revised Recommendations for HIV Testing were analyzed for relevance to existing state-level HIV statutes. Utilizing data on HIV law from the AHA's Health Research and Education Trust, criteria for three categories of state-level statutory environments – 'Minor,' 'Moderate,' and 'Severe' Statutory Impediments' – were developed. Each state was assigned to one of these three categories. Also, for each category, strategies to optimally implement the new recommendations within the current statutory restrictions were developed.
Population Studied: HIV statutory law of the 50 states.
Principle Findings: The following provisions of the 2006 Recommendations pertain most significantly to existing HIV law: 1) 'separate written consent should not be required and that general consent for medical care should be sufficient for HIV testing' and 2) pre/post test 'prevention counseling should not be required.' Numerous states mandate informed consent for HIV testing and the specific elements for constituting consent in their statutes varies. Some states specifically require a signed written consent form, some are less stringent, requiring verbal or written consent, and others are less specific, not specifying written versus verbal. Many states also legally stipulate prevention counseling when performing an HIV test. Criteria for the overall legal permissibility of the 2006 Recommendations are based on a composite characterization of statutory requirements for consent and counseling. Seven states fall in the 'Severe' impediment category, where meaningful implementation of the new testing policy is not possible without substantive legislative amendment. Twenty-four states fall into the 'Moderate' impediment category, where partial implementation utilizing either modified

informed consent or counseling procedures is possible. Twenty states fall into the 'Minor' impediment category, where the statutory environment is most amenable to full implementation of the new testing guidelines.
Conclusions: There are numerous state-level statutory impediments to implementation of the 2006 CDC recommendations for HIV testing. Currently, comprehensive implementation is not legally permissible in 31 of the 50 states.
Implications for Policy, Practice or Delivery: Given existing statutory impediments, public health officials should 1)develop partial implementation plans that are legally permissible and 2)work closely with legislators to amend obstructive laws.
Funding Source: RWJF

▪ Complex and Adaptive Systems? Changes in the Organizations Contributing to Local Public Activities: 1998 to 2006

Glen Mays, Ph.D., M.P.H.

Presented By: Glen Mays, Ph.D., M.P.H., Associate Professor, Department of Health Policy and Administration, University of Arkansas for Medical Sciences, 4301 W. Markham Street, #820, Little Rock, AR 72205, Phone: (501) 526-6647, Fax: (501) 526-6620, Email: gpmays@uams.edu

Research Objective: Governmental public health agencies rely to varying degrees on the cooperation and assistance of other public and private organizations in performing health assessment, surveillance, health education, and disease prevention activities. The Institute of Medicine repeatedly has called for greater coordination among organizations that have relevant resources and skills to contribute to public health activities. Heightened awareness of threats ranging from bioterrorism to obesity and pandemic influenza may create opportunities and incentives for engaging new partners in the public health enterprise. The objectives of this analysis are to: (1) identify the types of organizations that contribute to local public health activities and the degree of change in these contributions over time; (2) assess the institutional, economic, and environmental factors that appear to influence these contributions; and (3) determine whether changes in organizational contributions are associated with changes in the availability of local public health activities.
Study Design: A longitudinal cohort design is used to analyze changes in organizational contributions to public health activities. A stratified random sample of the nation's 3000 local health department directors (n=497) were surveyed in 1998 (78% response) and again in 2006 (68% response) to determine the availability of 20 common public health activities within their jurisdictions and to identify the types of organizations that participate in performing each activity. Survey data were linked with contemporaneous information on departmental organizational and financial characteristics as well as community characteristics. Multivariate hierarchical regression models for panel data were estimated to test for changes in organizational contributions over time and differences across communities defined by demographic, economic, organizational and geographic characteristics.
Population Studied: The population sampled includes all U.S. agencies meeting the nationally-accepted definition of a local health department: an administrative or service unit of a local or state government that has responsibility for the health of a jurisdiction smaller than a state.
Principle Findings: Overall rates of participation in public health activities increased significantly for 11 of the 15 organizational categories examined ($p<0.05$), with the largest increases observed for community health centers, private businesses/employers, health insurers, and educational institutions. Among private organizations, community hospitals and community-based nonprofits maintained the highest rates of participation and participated in the largest scope of activities, and this participation remained relatively stable over time. Rural communities and communities with relatively high poverty rates were more likely than their counterparts to experience reductions in participation for selected types of organizations, particularly insurers and physician practices. Local health departments reduced their participation in several of the activities that experienced large increases in participation by other organizations, suggesting substitution effects. Multivariate estimates indicated that increases in participation rates by private organizations were associated with significant increases in the total number of public health activities available within communities ($p<0.01$).
Conclusions: Local public health delivery systems are becoming more organizationally complex. These changes may allow systems to perform an expanded array of activities, while also shifting the roles of government within these systems.

Implications for Policy, Practice or Delivery: Policies to encourage coordination and assure quality and accountability may be required as more public health activities are performed through multi-organizational systems.
Funding Source: RWJF

Strategies to Address Challenges to the Public's Health

Chair: Dawn Jacobson, M.D., M.P.H.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

- **Does the Availability of Workplace Smoking Cessation Programs Increase Quit Attempts?**

Curtis Florence, Ph.D., E. Kathleen Adams, Ph.D.

Presented By: Curtis Florence, Ph.D., Assistant Professor, Health Policy and Management, Emory University, Rollins School of Public Health, 1518 Clifton Road NE, Atlanta, GA 30322, Phone: (404) 727-2818,
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Research Objective: To estimate the average population effect of workplace based smoking cessation programs on the rate of smoking quit attempts. There have been several experimental studies of the impact of various cessation programs on the likelihood of quits, but in practice the availability and participation in these programs is voluntary. It is therefore possible that workers who are more likely to attempt a quit may negotiate with their employers to provide a program. If this is the case, the provision of the program in the workplace may simply substitute for other quitting methods, and the provision of workplace programs will not increase the overall quit rate.
Study Design: We use data from the 1998 National Health Interview Survey Prevention Module on smoking behavior and the availability of workplace smoking cessation programs. We employ the size of an employees' worksite as an instrumental variable to control for the potential endogeneity of the availability of workplace smoking cessation programs. We estimate bivariate probit models of program availability and smoking quit attempts.
Population Studied: Workers age 18 to 64 who currently smoke.
Principle Findings: Overall, 16.8 percent of workers who currently smoke had a smoking cessation program at work. 48.5 percent of workers who had these programs attempted a quit in the previous year, while 41.2 percent of smokers without the programs attempted a quit. This difference is statistically significant. The magnitude of the difference between these two groups is unchanged when controlling for worker and workplace characteristics in a regression model. Endogeneity tests of program availability in the bivariate probit model could not reject the null hypothesis that the availability of the program is exogenous.
Conclusions: We find that workplace based smoking cessation programs significantly increase the proportion of smokers who attempt to quit. This result is applicable to a nationally representative sample of all U.S. workers. The finding that program availability is exogenous suggests that program availability is not a function of workers' desire to attempt a quit.
Implications for Policy, Practice or Delivery: These results imply that providing smoking cessation programs at the workplace will increase the likelihood of quit attempts. Therefore, policies that encourage employers to provide these programs (such as the HealthyPeople 2010 guidelines) should increase quit attempts.
Funding Source: CDC

- **Effects of Mass Media Coverage on Influenza Vaccination Timing among Medicare Elderly**

Byung-Kwang Yoo, M.D., Ph.D., Margaret L. Holland, M.S., Matthew TestaWojteczko, B.S., Peter Szilagyi, M.D., M.P.H.

Presented By: Byung-Kwang Yoo, M.D., Ph.D., Assistant Professor, Department of Community and Preventive Medicine, University of Rochester, School of Medicine and Dentistry, 601 Elmwood Avenue, Box 644, Rochester, NY 14642, Phone: (585) 275-3276, Fax: (585) 461-4532,
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Research Objective: While influenza disease results in substantial morbidity and mortality, particularly among the elderly, shortages or delays in the supply of influenza vaccine have occurred during four influenza seasons since 2000. These problems have heightened interest in both the receipt of influenza vaccine and factors that affect vaccination. Mass media is hypothesized to influence the receipt and timing of influenza vaccination through its coverage of influenza disease, vaccine shortage and a possible bird flu pandemic. We quantified how mass media coverage affects influenza vaccination timing during each influenza season

among the elderly population throughout the US.
Study Design: Cross-sectional analysis for each year between 1999 and 2002 using the Medicare Current Beneficiary Survey (MCBS) with associated claims. We utilized survival models where the outcome variable measured vaccination timing as the number of weeks from September 1. We measured mass media coverage by the number of articles reported by the newspaper "USA Today" for a certain period, using specific key words (e.g., influenza, vaccine or shot, shortage or delay, avian or bird). Explanatory variables for each week during influenza season were the number of newspaper articles, the number of vaccine doses available at the national level, and mortality due to pneumonia and influenza in the nine census regional divisions. Additional covariates at the individual level included demographic factors, health status, preventive behavior and socio-economic characteristics.
Population Studied: Community dwelling Medicare elderly aged 65 or older (N = 6568, 6439, 6412, 6464 for 1999-2002 respectively), excluding those enrolled in Medicare managed care plans and those with 30 days or more of skilled nursing facility care any time between September 1 and December 31 for each year.
Principle Findings: A hazard ratio (HR) from Weibull models indicated that individuals are 1.02-1.60 times more likely to be vaccinated due to media coverage on "influenza" during the same week, controlling for other covariates ($p<.05$). This ratio increased in magnitude and significance level when additional key words were added in measuring articles. For instance, the addition of "vaccine or shot" and "shortage or delay" had HR ranging from 1.20 to 4.20, and that of "bird or avian" had HR of 1.38-17.5. These positive associations remained, but tended to be smaller in magnitude and significance level when the media exposure was 1 or 2 weeks prior to flu shot receipt. As previously shown, factors associated with vaccination for each week included prior receipt of influenza or pneumococcal vaccination, being a non-smoker, older, white, married, and at a higher income level.
Conclusions: The media coverage on flu appears to increase the likelihood of vaccination during the three weeks following the coverage. This effect is greater for a more specific topic such as vaccine shortage and bird/avian flu.
Implications for Policy, Practice or Delivery: Health care leaders should consider individuals' perceptions of influenza risk being modified at short intervals (i.e., weekly) and the effects of media coverage in influencing the "demand" for influenza vaccine, particularly in relation to vaccine shortages, a severe epidemic or a pandemic.

- Worksite Wellness Programs: Factors Associated with Program Availability and Employee Participation

Edmund Becker, Ph.D., Douglas Roblin, Ph.D., Peter Joski, M.S.P.H.

Presented By: Edmund Becker, Ph.D., Professor, Health Policy and Management, Rollins School of Public Health at Emory University, 1518 Clifton Road NE, Atlanta, GA 30322, Phone: (404) 727-9969, Fax: (404) 727-9198,
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Research Objective: Worksite wellness programs are associated with many positive healthcare outcomes: lower health care costs, reduced absenteeism, higher productivity, reduced use of health care benefits, reduced worker's comp/disability, reduced injuries, and increased morale and loyalty. Information on availability of worksite facilities and programs and rates of participation in those programs, however, is limited. We studied: 1) availability of worksite wellness facilities and programs, and 2) association of employee characteristics with both availability of, and participation in, wellness programs and activities among working age adult enrollees of a group-model MCO in a large metropolitan area.
Study Design: Data were collected on a mixed mode survey in 2005 of 25-59 year old MCO enrollees employed by large public and private employers in the Atlanta area. Enrollees (N=5,309) were randomly sampled from 3 cohorts defined from MCO databases: diabetes, elevated lipids without CAD, and "low risk". The survey included items related to worksite characteristics (including availability of worksite wellness programs or activities), patient activation (PAM-13), work climate (MIDUS), and height and weight (for computing BMI). The association of program or activity availability with employee characteristics was assessed by descriptive statistics. Using logistic regression, we estimated likelihood of participation, given availability, as a function of patient activation and work climate, controlling for other employee characteristics.
Population Studied: 2,224 respondents (42% response rate): 652 with diabetes, 792 with elevated lipids, 780 low risk

Principle Findings: 76.9% of respondents indicated that their worksites had 1 or more programs or activities promoting exercise; 31.6% indicated that their worksites had 1 or more activities related to diet or healthy eating. Employees with diabetes, annual household income < $50,000, or high BMI were less likely to be employed at worksites with programs or facilities supporting exercise or healthy behavior ($p<0.05$). Where available, only 22.1% of respondents participated in a program promoting exercise; 15.5% participated in a program on diet or healthy eating. Patient activation was significantly, positively associated with likelihood of participation in programs or activities related either to exercise or to diet. Work climate – primarily coworker support – was significantly, positively associated with likelihood of participation in programs or activities related to exercise but not to diet. Given availability of programs or activities, there was no difference in likelihood of participation between adults with diabetes, elevated lipids, or low risk adults.
Conclusions: Employees who might clinically benefit from availability of wellness programs – notably adults with diabetes or high BMI – were least likely to work where supportive programs or activities were available. Where available, participation in exercise or diet programs and activities was low but did not differ by clinical condition. Participation was primarily affected by employee activation and, for exercise, a worksite with high levels of support and collegiality among coworkers.
Implications for Policy, Practice or Delivery: Community health could be improved from MCO and employer partnerships to increase availability of programs and facilities that support the practice of healthy behaviors. In particular, for populations with greater clinical need, employers and healthcare policymakers need to increase their efforts to make facilities and resources available.
Funding Source: CDC

- **The Association of Neighborhood Characteristics & Social Interactions with Exercise & Obesity among Employed Adults**

Douglas Roblin, Ph.D., Edmund Becker, Ph.D., Peter Joski, M.S.P.H.

Presented By: Douglas Roblin, Ph.D., Senior Research Scientist, The Center for Health Research/Southeast, Kaiser Permanente Georgia, 3495 Piedmont Road, NE, Bldg. 9, Atlanta, GA 30305, Phone: 404-364-4805, Fax: 404-364-7361, Email: Douglas.Roblin@KP.Org

Research Objective: Regular exercise and healthy eating have well recognized health benefits. Among US adults, diets have excess fat and inadequate fruit and vegetable (F/V) intake; and, recommended levels of physical activity are typically not achieved. We studied the associations of neighborhood characteristics and social interactions with exercise and obesity among working age adults in a MCO.
Study Design: Data were collected on a mixed mode survey in 2005 of 25-59 year old MCO enrollees employed by large public and private employers in the Atlanta area. Enrollees (N=5,309) were randomly sampled from 3 cohorts defined from MCO databases: diabetes, elevated lipids without CAD, and "low risk". The survey included items related to neighborhood characteristics (e.g. nearby walking or cycling paths), social climate (MIDUS), exercise (BRFSS), and height and weight (for computing BMI). We estimated likelihoods of recommended exercise level, physical inactivity and obesity (using logistic regression) as a function of social climate and neighborhood characteristics, controlling for cohort, age, gender, race, marital status, and education.
Population Studied: 2,224 respondents (42% response rate): 652 with diabetes, 792 with elevated lipids, 780 low risk
Principle Findings: 42.4% of respondents reported recommended physical activity levels; 12.7% were considered to be physically inactive; and, 42.0% were considered to be obese. Adjusted for other covariates, more supportive networks of family and friends, nearby walking or cycling paths, and exercise equipment in the household were significantly ($p<0.05$) associated with increased likelihood of recommended physical activity level and decreased likelihoods of inactivity and obesity. Presence of sidewalks in the neighborhood was also significantly associated with decreased likelihoods of inactivity and obesity.
Conclusions: Infrastructure (neighborhood and household) has significant associations with physical activity and obesity. Adults in neighborhoods with infrastructure that promotes outdoor activities are more likely to exercise regularly and less likely to be obese. Relationships within networks of family and friends, however, have an independent effect. Supportive social interactions among family and friends may be important for activating adults to engage in regular exercise, thereby attenuating risk of obesity.
Implications for Policy, Practice or Delivery: Both the built environment and the psychosocial

environment independently contribute to healthy, or unhealthy, behaviors. Community health might be improved from partnerships of MCOs with neighborhood and social organizations to increase the availability of facilities that promote exercise and programs that promote social interactions to motivate and sustain adults in the practice of healthy behaviors.

Funding Source: CDC

▪ Causes and Consequences of Change in Local Public Health Spending

Glen Mays, Ph.D., M.P.H.

Presented By: Glen Mays, Ph.D., M.P.H., Associate Professor and Chair pro tem, Health Policy and Management, University of Arkansas for Medical Sciences, 4301 W. Markham Street, #820, Little Rock, AR 72205, Phone: (501) 526-6647, Fax: (501) 526-6620, Email: gpmays@uams.edu

Research Objective: A growing body of evidence indicates that the availability and quality of public health services vary widely across communities, but relatively little is known about the factors that give rise to this variation. Public health activities in the U.S. are supported through a patchwork of funding streams that are subject to change over time in response to economic and policy shifts at national, state, and local levels. This variability in spending may have important consequences for community health. The objectives of this analysis are to: (1) examine how local public health spending levels and funding sources changed over the past decade; (2) identify the types of communities most likely to experience disparities in public health spending; and (3) determine whether changes in public health spending are associated with changes in community health status and disease burden.

Study Design: A longitudinal cohort design is used to analyze changes in spending patterns and population health within service areas of the nation's nearly 3000 local public health agencies between 1993 and 2005. The National Association of County and City Health Officials (NACCHO) collected data on the organizational and financial characteristics of these agencies through census surveys fielded in 1993, 1997, and 2005. We linked these data with contemporaneous information on community characteristics, federal and state spending, and public health disease burden from other data sources. Multivariate regression models for panel data are estimated to test for changes in spending patterns over time and differences across communities defined by demographic, economic, organizational and geographic characteristics. Instrumental-variables methods are used to identify associations between spending levels and community health while controlling for unmeasured factors that jointly influence spending and health.

Population Studied: The study includes all U.S. agencies meeting NACCHO's definition of a local health department: an administrative or service unit of a local or state government that has responsibility for the health of a jurisdiction smaller than a state. There were 2875 such agencies in 1993 (response rate 77%) and 2864 in 2005 (response rate 80%).

Principle Findings: Local public health agency spending increased from a median of $20 per capita in 1993 to $29 in 2005 (nominal dollars), indicating an annual growth rate of less than 4%. More than 20% of agencies experienced reductions in per capita spending. Larger increases in spending were observed among agencies serving metropolitan communities, agencies operating as units of local government, and agencies governed by local boards of health ($p<0.01$), even after adjusting for other agency and community characteristics. Increases in spending were associated with significant improvements ($p<0.05$) in several key measures of community health, including infant mortality and case rates for clamydia, gonorrhea, hepatitis, and tuberculosis. Instrumental-variables estimates indicate that even stronger relationships exist after accounting for unmeasured characteristics that jointly influence spending and health.

Conclusions: Public health spending varies widely across U.S. communities, and this variability has persisted over time. Differences in spending may contribute to differences in community health outcomes.

Implications for Policy, Practice or Delivery: Policies to expand local public health resources and improve infrastructure may help to address important differences in health status across communities.

Funding Source: RWJF

Prevention & Treatment of Chronic Illness

Prevention & Treatment of Chronic Illness: Complexity & Chronic Disease Management

Chair: Timothy Ferris, M.D., M.P.H.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ **The Effectiveness of a Patient-Centered Care Coordination/Home Telehealth Chronic Disease Management Program for Veterans with Diabetes: A Four-Year Follow-up**

Neale Chumbler, Ph.D., Tracey Barnett, Ph.D., Bruce Vogel, Ph.D., Rebecca Beyth, M.D., M.Sc., Rita Kobb, M.N., A.R.N.P.

Presented By: Neale Chumbler, Ph.D., Research Health Scientist, VA HSR&D and RR&D RORC (151B), North Florida/South Georgia Veterans Health System, 1601 SW Archer Road, Gainesville, FL 32608-1197, Phone: (352) 376-1611 x4920, Fax: (352) 271-4540, Email: neale.chumbler@med.va.gov

Research Objective: To assess the effectiveness of a Department of Veterans Affairs (VA) patient-centered care coordination/home telehealth (CCHT) chronic disease management program as an adjunct to treatment for older veterans with diabetes. This program consisted of a care coordinator who used disease management principles through the care continuum, managed treatment for veterans with diabetes, and equipped the patient in self-management skills with a goal of reducing costly health services (e.g., hospitalizations).
Study Design: Four-year, retrospective matched cohort study design. The VA CCHT program was implemented at 4 VA medical centers in a single Veterans Integrated Service Network. Care coordinators monitored patient responses through an in-home messaging device. A total of 391 high-use veterans with diabetes (two or more all-cause hospitalizations or emergency department visits in the year prior to enrollment) were enrolled. A matched comparison group of 391 veterans with diabetes who met the same inclusion criteria was randomly selected from VA administrative data. Healthcare utilization (hospitalizations, length of stay, and outpatient visit by type) was measured at 12 months before and 48 months after enrollment for both groups. Propensity scores were applied to improve the balance between the treatment and comparison groups. A difference-in-differences (DiD) approach was used in the multivariable statistical models to control for unobserved selection bias in the treatment effect for patients in the programs.
Population Studied: High service use older veterans with diabetes.
Principle Findings: Four years after enrollment, 169 of the 391 CCHT veterans remained in the program. Reasons for non-enrollment at 4 years included refused follow-up (83), mortality (50), discharged because of health improvement (29), discharge to long-term care facility (27), lost to follow-up (25), and other reasons (6). Compared to those who dis-enrolled, veterans enrolled at four years differed only in marital status and program site. Over 48 months, the treatment group experienced significant decreases in all-cause hospital admissions (from 29% to 16%, p = .008) and diabetes-related hospitalizations (26% to 13%, p = .003)
Conclusions: The DiD design of the present work avoids the pitfall of regression to the mean, which characterizes much of the chronic disease management literature. The rigor of our study design strengthens the finding that the CCHT program was effective in reducing hospitalizations (both all-cause and diabetes related) for patients with diabetes.
Implications for Policy, Practice or Delivery: Our results suggest that the VA CCHT program can reduce avoidable service use even at 48 months after implementation, as evidenced by the reduction in hospitalizations. The findings also suggest that the CCHT program improves the quality of care for veterans through the incorporation of new patient education and telecommunications technologies that involve greater, more timely patient-clinician interaction. In this way, the program supports greater access to care and improved self-management for veterans with diabetes.
Funding Source: VA, VISN-8 Community Care Coordination Service

▪ **Congestive Heart Failure Disease Management in Medicare Managed Care**

Ateev Mehrotra, M.D., M.P.H., Barbara J McNeil, M.D., Ph.D., Bruce E Landon, M.D., M.B.A.

Presented By: Ateev Mehrotra, M.D., M.P.H., Policy Researcher, RAND Health, 4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213, Phone: (412) 683-2300 x 4894, Fax: (412) 802-4972, Email: mehrotra@rand.org

Research Objective: In 2001 the Center for Medicare and Medicaid Services (CMS) required all participating Medicare health plans to participate in a three year quality assessment and performance improvement program for CHF and simultaneously initiated an "extra payment" program to reward high quality CHF care. These initiatives made it more likely that Medicare managed care plans would institute a CHF disease management program. Despite substantial enthusiasm for disease management, however, little is known about the content of health plans disease management programs and what barriers health plans face in implementation. We sought to describe the structure and content of the Congestive Heart Failure (CHF) disease management programs being used by Medicare managed care plans.
Study Design: Structured telephone survey of Medicare managed care plans supplemented by open-ended in-depth interviews with twenty health plans selected from each of CMS's ten regions. Surveys and interviews were conducted between March 2003 and February 2004.
Population Studied: Medicare managed care enrollees
Principle Findings: We received survey responses from 84 of 120 eligible health plans (70%). Almost all respondents (92%) reported that the health plan had a CHF disease management program; however, 45% of the programs were implemented in 2001 or later (after the CMS initiative). Health plans have taken two different approaches to disease management with 58% creating an in-house program and 42% externally contracting with a commercial vendor. Commercial vendor use was more common in larger (57% >30,000 Medicare enrollees vs. 24% <15,000, p=0.05), national (50% vs. 21%, p=0.03), and for-profit (45% vs. 21%, p=0.03) health plans. Disease management programs more commonly focused on improving patient self-management than on changing physician behavior. For example, 87% of the programs provide a scale for patients, but only 62% address ACE inhibitor use and only 23% provide feedback to individual physicians on whether their care was consistent with CHF guidelines. As compared to in-house programs, commercial vendor programs were more likely to enroll only high-risk patients (56% vs. 23%, p=0.003) and to enroll patients for a short period of time (38% >12 months vs. 68%, P=0.03). Seventy-five percent of health plan representatives believed that disease management programs decreased costs, and 77% believed they improved health outcomes.
Conclusions: Our examination of Medicare managed care plans use of CHF disease management programs finds that there is wide spread use of such programs. Some of these programs appear to have been initiated in response to the institution of a CHF quality improvement initiative and financial incentives for improved quality. The content of the health plan programs differs from disease management programs previously described in the literature in that they are less likely to focus on medication management and compliance with guidelines. This likely reflects the difficulty disease management programs have in engaging physicians.
Implications for Policy, Practice or Delivery: The question remains whether Medicare health plan disease management programs will achieve quality improvement and cost savings and are sustainable in the long-term.
Funding Source: HRSA

- **Prevention and Treatment of Chronic Illness in Italy: Disease Management through Physician and Care Manager Teams Located in Physician Offices**

Joel Rosenquist, M.P.A., Rodolfo Rollo, M.D., Ambrogio Aquilino, M.D., Andrea Musilli, Stephanie Spoerl, M.P.H., Michela Procaccini, M.D.

Presented By: Joel Rosenquist, M.P.A., Senior Manager, International Initiatives, Pfizer Health Solutions, 2400 Broadway, Suite 500, Santa Monica, CA 90404, Phone: (310) 586-2532, Fax: (212) 338-1506,
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Research Objective: The clinical challenges of effectively managing patient populations with chronic illnesses requires a shift from the traditional medical model of care to a new, patient-centered paradigm which emphasizes a partnership between physicians, healthcare providers and patients. Project Leonardo, a public-private partnership between the Puglia Regional Health Authority of Italy and Pfizer Italia, is a disease management program that utilizes a team-based approach of Care Managers, physicians and specialists as "partners" of the patient. It includes three innovative features: 1. CMs work in General Practitioner offices; 2. GPs are monetarily incentivized to meet clinical and process goals; and, 3. Prevention of chronic illness is emphasized. We discuss policy implications for the management and prevention of chronic

illness by examining the program's clinical and process outcomes, physician and patient engagement and acceptance, and feasibility of this new model of care.
Study Design: This 18-month, prospective feasibility study utilizes a pre-post design, with data collected at baseline and at periodic intervals during the initiative. Patients receive: 1. On-going, one-on-one health coaching sessions; 2. Customized, patient focused care plans; 3. Education materials; and, 4. Service coordination between providers. In managing patients, the CMs use InformaCare, an evidence-based, decision support tool. Expected results include improved health outcomes and more appropriate service utilization.
Population Studied: Project Leonardo currently has 30 CMs located in 20 GP group offices and has enrolled 1,153 patients with diabetes, heart failure, and/or cardiovascular risks.
Principle Findings: Results to date include: 59% of patients report improvement in functional ability; 66% report improvement in their general health; an increase in proportion of patients meeting their blood pressure goals, from 32% to 50% at $p<.05$; Patients' self-reported medication adherence, as measured by the Morisky Medication Compliance Scale, improved significantly at $p<.001$, as did their SF-12 mental health scores at $p<.01$; improvement in SF-12 physical health scores approached significance at $p=.057$; 60% of patients report improved relationships with their GP; 76% of care plans developed jointly by CMs and GPs.
Conclusions: Team-based DM that places CMs in GP offices has demonstrated a positive impact on patient health behaviors and clinical outcomes. This model facilitates care coordination between providers and improved patient-provider relationships. Cultural adaptation of DM and the CM role to the local setting is essential to the success of the model.
Implications for Policy, Practice or Delivery: Governments, health systems, and provider groups seeking to effectively manage populations with, or at risk for chronic illness, should consider patient-centered, primary care oriented DM programs that place CMs in GP offices and utilize GP incentives. This model offers benefits over traditional telephonic, call center-based DM by facilitating physician involvement in DM, promoting enhanced collaboration between providers, and allowing CMs to benefit from existing GP-patient relationships. This approach is especially relevant for healthcare settings where telephonic coaching is not a feasible option due to complexity of patients' medical/psychosocial needs or cultural norms that emphasize face-to-face encounters. Innovative public-private partnerships are a viable option for pursuing these programs.
Funding Source: Project Leonardo is a partnership supported by the Puglia Regional Government, Pfizer Italia, and Pfizer Health Solutions Inc U.S.

- **Expenditure and Utilization Reductions From a Primary Care-Based, Multicondition Care Management Program**

David A. Dorr, M.D., M.S., K. John McConnell, Ph.D., Steven M. Donnelly, Ph.D., Cherie P. Brunker, M.D.

Presented By: David A. Dorr, M.D., M.S., Assistant Professor, Medical Informatics & Clinical Epidemiology, Oregon Health & Science University, 3181 SW Sam Jackson Park Road, Mailcode: BICC, Portland, OR 97239, Phone: (503) 418-2387, Fax: (503) 494-4551, Email: dorrd@ohsu.edu

Research Objective: To determine the effect of a comprehensive care management program called Care Management Plus (CMP) on Medicare expenditures, with secondary analyses to determine the sensitivity of modeling.
Study Design: CMP is a program of active referral to care managers for patients with complex needs, such as multiple chronic illnesses; protocols, information technology, and self-management tools are used to maximize patient health. We used the method of "difference-in-differences," comparing changes in Medicare Part A/B expenditures after enrollment in CMP to a comparable group of patients who were not enrolled in CMP. Patients enrolled in CMP were matched to non-CMP patients using Mahalanobis distance criteria based on sex, age, ethnicity, comorbidity score, and previous utilization (hospitalization count and expenditures). We used a linear regression on matched covariates to remove bias associated with imperfect matching. Our primary outcome was the change in expenditures,associated with enrollment in CMP. Subanalyses were done on quartiles of expenditure costs and comorbidities to better understand program effect. Sensitivity analyses were completed by omitting variables and rematching.
Population Studied: All patients were >65 years old and had been enrolled in Medicare for 1 year prior to enrollment in analysis. Exposure

patients were referred to CMP in one of seven primary care clinics, whereas control patients were matched from 22 clinics without CMP. Patient's average age was 75.3 ± 6.8, with 20.4% having an admission in the previous year. 75.6% of patients had 2 or more comorbidities, with diabetes (48%) and hypertension (75%) most prevalent.
Principle Findings: In all, 1,144 exposure patients (CMP group) and controls were matched. Annual expenditures for CMP patients were $389.52 (7%) lower than their matched cohort, although this difference was not statistically significant.. However, among patients with diabetes, who were enrolled in CMP, annual expenditures were substantially lower $1654.56 (-27.8%), statistically significant at p=.01. Patients with the most complex diabetes had the largest decreases. Sensitivity analyses for all patients showed failure to match on previous admission biased the results toward the CMP group (-784.92, p=.06), and failure to include previous costs biased towards controls (p=.003). For patients with diabetes, the analyses were sensitive to omission of comorbidities and previous costs towards controls, making the groups equivalent (p=.13-.61).
Conclusions: Our care management program for multiple chronic illnesses showed a significant reduction in subpopulations of the most complex patients and a trend for all patients. When focused on patients with complex diabetes, the program would bring a 2:1 reduction in overall expenditures (net savings $182,000 per clinic).
Implications for Policy, Practice or Delivery: Programs that address patients with complex chronic conditions can reduce expenditures, but reimbursement models need to focus on intense care for those most vulnerable. Models of cost expenditure changes in subpopulations (e.g., treated vs. untreated) can give dramatically different results without key clinical and cost variables.
Funding Source: The John A. Hartford Foundation

▪ A Longitudinal Evaluation of Care Management for Elders with Comorbidities

Paul Shelton, Ed.D., Cheryl Schraeder, R.N., Ph.D., F.A.AN, Robert Newcomer, Ph.D.

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Research Objective: To evaluate whether a multidisciplinary, coordinated primary care approach can improve medical treatment plans, reduce avoidable hospital admissions and promote self-care behaviors and clinical health status outcomes without increasing program costs.
Study Design: A 48 month prospective, randomized clinical trial. The intervention, based on the core components of the chronic care model, provides care and disease management services to elderly patients from primary care teams comprised of primary care physicians, registered nurses, and patients.
Population Studied: Over 2,000 Medicare beneficiaries who enrolled in the study between April, 2002 and April, 2003 (control group = 1,140; intervention group = 1,161), lived in east-central Illinois, and had a diagnosis of artial fibrillation, congestive heart failure, coronary artery disease, chronic obstructive pulmonary disease or diabetes mellitus.
Principle Findings: At the end of 36 months there were significant differences in outcomes between the intervention and control groups. Intervention patients with diabetes had higher rates of annual foot exams compared to control group patients (58% vs. 40%, p<.001) and intervention patients with congestive heart failure had higher rates of daily weighing (36% vs. 18%, p=.02). Intervention patients had higher rates of annual lipids testing (LDL-C and triglycerides) compared to control group patients (71% vs. 64%, p=.003) and patients with diabetes had higher annual albuminuria testing (63% vs. 47%, p<.001). Despite these differences in testing rates there were no significant differences in therapeutic control between the intervention and control groups in lipids, blood glucose or albuminuria levels. Intervention patients had higher rates of blood pressure control compared to control group patients (65% vs. 58%, p=.002). Intervention patients rated their overall satisfaction with healthcare higher than control group patients (8.9 vs. 8.5, p<.001) and satisfaction with their nurse partner higher than control patients rated their physician's nurse/office staff (9.3 vs. 9.0, p<.001). These results are similar at 48 months, with over 60% of the study population having completed the evaluation period. Results will also be presented on health service encounters and Medicare costs for the first 45 months of

program operation (April, 2002 through December, 2005).
Conclusions: Chronic illness is a principle source of disability and a major factor of health care expenditures. Multimorbidity, the coexistence of two or more chronic conditions, is a significant problem in the practice of medicine, especially among older patients. It is well documented that our present health care system suffers from deficiencies in providing appropriate chronic disease care. A multidisciplinary, primary care team approach, combined with case and disease management, has emerged as a model for patients with multimorbidity. While this model has intrinsic appeal it has not been broadly replicated outside of limited clinical trials, raising questions about its generalizability and cost-effectiveness. These findings suggest that promising clinical results can be achieved when multidisciplinary, primary care teams work in partnership to manage elders with multiple, chronic illnesses. They also highlight the unique and difficult challenges interventions face with this elderly population.
Funding Source: CMS

Prevention & Treatment of Chronic Illness: Population Needs & Approaches

Chair: Anne Sales, Ph.D., M.S.N.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

▪ Identifying and Improving Care for Patients at High Risk of Frequent Hospitalization

Maria Raven, M.D., M.P.H., John Billings, J.D., Marc Gourevitch, M.D., M.P.H., Eric Manheimer, M.D.

Presented By: Maria Raven, M.D., M.P.H., CDC/NYU Fellow in Clinical Medicine and Public Health Research, and Clinical Instructor, Emergency Medicine, General Internal Medicine and Emergency Medicine, NYU/Bellevue, 45 Crosby Street, Apt 4N, New York, NY 10012, Phone: (917) 499-5608, Fax: (212) 680-1321, Email: mxraven@earthlink.net

Research Objective: A logistic regression algorithm developed by Billings identifies patients, at the time of hospital admission, who are at high risk for readmission in the following 12 months. Claims analysis can provide valuable information about these patients' characteristics (prior use patterns, presence of chronic/multiple chronic disease, etc). However, more in-depth information is needed regarding underlying precipitants of frequent admission rates that might inform interventions to reduce or prevent future hospitalizations. In this multi-method study we sought to describe the personal and social context of these high-risk patients to define key elements requiring intervention.
Study Design: We obtained inpatient, Emergency Department, and clinic visit data for 36,457 patients with a visit to Bellevue Hospital from 2001 to 2006. These computerized records were analyzed to identify the frequency of and intervals between prior hospital and Emergency Department use, primary and specialty care use patterns, history of chronic medical conditions, types of specialists consulted, and other information. We developed a logistic regression algorithm that created a risk score of 1-100 for each patient, with patients with higher risk scores having higher predicted probability of future admissions. For admitted patients with risk scores of 50 or greater, an interview was conducted with the patient, his or her in-hospital providers, and where available, family, prior to discharge to obtain information on the patient's usual source of care, mental health and substance use history, medical health, social circumstances, and other factors that might have contributed to the current admission.
Population Studied: All English or Spanish-speaking fee-for-service Medicaid patients aged 18-64 with a prior visit to Bellevue between January 1, 2001 and June 30, 2006 admitted to Bellevue from August 7-October 13, 2006. Patients with HIV infection, patients unable to communicate, and institutionalized patients were excluded.
Principle Findings: Of 36,457 adult fee-for-service Medicaid patients seen at Bellevue over the previous 5 years, 2,618, or 7.18 percent, had an algorithm-based risk score of 50 or greater. 68 percent of interviewed patients had at least one chronic medical condition, and approximately half were admitted for substance use services or medical conditions related to chronic substance use. The majority lived alone, and 42 percent reported lacking adequate social support to cope with their conditions. 40 percent cited the ED as their usual source of care, and 16 percent had no usual source of care. 34 percent were homeless, another 24 percent were precariously housed with family or friends, and 50 percent had considered themselves homeless in the previous 2 years.
Conclusions: Social isolation, substance use, mental health, and housing issues were prevalent in our study population and cited by

patients and their caregivers as contributing substantially to their hospital admissions.
Implications for Policy, Practice or Delivery: These data will inform design of a multi-dimensional intervention for similar high-risk patients at our hospital with the goal of improving the quality of their out-of-hospital care and reducing their rates of hospital readmission.
Funding Source: United Hospital Fund

- Rethinking Prevention in Primary Care: Applying the Chronic Care Model to Address Health Risk Behaviors

Dorothy Hung, Ph.D., M.A., M.P.H., Thomas Rundall, Ph.D., Alfred Tallia, M.D., M.P.H., Deborah Cohen, Ph.D., Helen Halpin, Ph.D., Benjamin Crabtree, Ph.D.

Presented By: Dorothy Hung, Ph.D., M.A., M.P.H., Research Scientist, Sociomedical Sciences, Columbia University Mailman School of Public Health, 722 W. 168th Street, Suite 942, New York, NY 10032, Phone: (212) 342-0154, Email: dh2237@columbia.edu

Research Objective: The Chronic Care Model (CCM) may serve as a template for prevention due to the many similarities between preventive care and management of chronic diseases. This study empirically examines the CCM as a framework for improving services to address health risk behaviors that are leading causes of death and disability in the U.S. Three main questions are explored: (1) To what extent are behavior change interventions conducted in primary care settings? (2) To what extent have real-world primary care practices implemented various components of the CCM? (3) What are the associations between each of these CCM components and the use of preventive services for behavioral modification?
Study Design: Cross-sectional survey data were obtained from 52 primary care practices participating in a national RWJF health promotion initiative. Practices were surveyed regarding their use of interventions to address risk behaviors as recommended by the U.S. Preventive Services Task Force (USPSTF). These included health risk assessments, individual counseling, group counseling, and referral to community programs for smoking, risky drinking, unhealthy dietary patterns, and physical inactivity. Based on prior conceptual and empirical work, various practice features were identified and measured as indicators of CCM elements. These indicators were included in multivariate regression analyses to estimate practices' use of preventive services for behavioral modification.
Population Studied: Primary care practice located nationwide.
Principle Findings: Practices reported infrequent delivery of preventive services and low implementation of CCM elements. However, practices owned by a hospital health system ($b=0.60$, $p<0.01$) and exhibiting a culture of quality improvement ($b=0.03$, $p<0.001$) were more likely to address risk behaviors. Also, practices that had a multispecialty physician staff ($b=0.50$, $p<0.05$) and staff dieticians ($b=2.05$, $p<0.05$); decision support in the form of risk factor chart stickers ($b=1.33$, $0<0.001$), checklists/flowcharts to manage care ($b=1.01$, $p<0.01$), patient chart review ($b=1.03$, $p<0.01$), and clinical staff meetings ($b=0.55$, $p<0.05$); and clinical information systems such as electronic medical records ($b=0.44$. $p<0.05$) were more likely to offer behavioral interventions. CCM elements explained 22-41% of the variance in use of USPSTF-recommended services to modify patient risk behaviors.
Conclusions: Despite a strong evidence base supporting the use of health risk assessment, behavioral counseling, and referral to community-based programs, we found that these were infrequently offered by a nationwide sample of primary care practices. In addition, we found incomplete implementation of the CCM which is consistent with previous studies. However, implementation of CCM elements in primary care practices were generally associated with increased use of behavior change interventions. In particular, the "health system organization" component, as reflected by practices whose cultural beliefs and values support quality improvement, was most significantly and consistently associated with the offering of services to address risk behaviors.
Implications for Policy, Practice or Delivery: Our findings suggest that primary care practices and their patients may benefit from more widespread implementation of the CCM. This framework adapted for prevention has the potential to not only better control existing chronic illnesses, but also reduce patients' risk of developing chronic diseases in the future.
Funding Source: RWJF

- Painful Facts about Chronic Pain Management: Inside Primary Care

Ming Tai-Seale, Ph.D., M.P.H., Richard Street, Jr., Ph.D., Jane Bolin, R.N., J.D., Ph.D.

Presented By: Ming Tai-Seale, Ph.D., M.P.H., Associate Professor, Health Policy and Management, Texas A&M, 1266 TAMU, College Station, TX 77843, Phone: (979) 845-2387, Email: mtaiseale@srph.tamhsc.edu

Research Objective: Chronic pain is a persistent, life-altering condition. Practice guidelines call for a patient centered, multi-factorial, comprehensive management plan that includes addressing biopsychosocial factors, as well as spiritual and cultural issues. The goal of treatment emphasizes on improving function through the development of long term self management skills including fitness and a healthy lifestyle. Despite the interest in measuring quality of pain management, very few studies have used direct observation to understand how pain management is delivered in primary care practices. Many studies of quality are constrained by their reliance on global assessments of clinical practices based on administrative data, patient or physician self-reports, or chart reviews. When compared with direct observation, those data have been documented to misrepresent the reality of clinical care. The purpose of this study is to assess the actual care process using videotapes of office visits involving chronic pain.
Study Design: Qualitative and quantitative methods were used to study videotapes of primary care office visits. The videotapes were coded to obtain data on if pain was discussed and the amount of time spent on discussing pain. Quantitative estimates measured the amount of time physicians and patients spent on discussing pain. Survival analysis examines determinants of the length of discussions.
Population Studied: Videotapes of 394 elderly patients' visits to primary care physicians – covering 2,585 diverse topics – in three U.S. locations between 1998 and 2000.
Principle Findings: Pain topics occurred in 44.7% of visits, accounting for 9.8% of total topics. The average time a physician spent discussing chronic pain was 2.1 minutes. A patient spent, on average, two minutes on pain. The range of pain topics included chronic joint and muscle pain, gastrointestinal pain, and oral and facial pain. Female patients were 50% more likely to have a pain discussion (OR=1.50, $p<0.05$). The length of pain discussion was 62% longer with patients who verbally expressed emotional distress (HR=0.53, $p<0.01$), 16% longer if the patients had initiated the topic (HR=0.86, $p<0.01$), 16% longer if a patient companion was present (HR=0.86, $p<0.01$), and 10% longer with college educated patients (HR=0.91, $p<0.05$). Qualitative discourse analysis suggested that physicians' effort in treating pain varied widely. In some cases, only perfunctory effort was made. While majority of pain treatment involved pain medications, in-depth discussions of their pros and cons were uncommon. Non-pharmacologic strategies (e.g., physical activity programs, patient education and cognitive behavioral therapy) were absent. Opportunities for showing empathy to patients in pain were often passed over.
Conclusions: Only 4.7 minutes – 2.1minutes from physicians and 2.0 minutes from patients – were spent on pain during elderly patients' office visits. The contents of interactions on pain management often appeared superficial and divergent from established practice guidelines.
Implications for Policy, Practice or Delivery: Elderly patients in chronic pain infrequently received guideline-concordant pain management in primary care settings. As the majority of elderly patients with pain seek care from primary care physicians, quality improvement effort should take into account how pain is actually managed. Incentives should be aligned with care that provides patient-centered guideline-concordant pain management.
Funding Source: NIMH, NIA

- **Chronic Illness and Unmet Need in a Single Payer Healthcare System**

Arlene S. Bierman, M.D., M.S., Beatrix Ko, H.B.Sc., Yingzi Li, M.Sc., Joanna Balinski, B.Sc.N., Rahim Moineddin, Ph.D.

Presented By: Arlene S. Bierman, M.D., M.S., Ontario Women's Health Council Chair in Women's Health Research, Medicine, Centre for Research on Inner City Health, St. MIchael's Hospital, 80 Bond Street, M5B 1X2, Phone: (416) 864-3041, Fax: (416) 867-6057, Email: arlene.bierman@utoronto.ca

Research Objective: The increasing prevalence of chronic illness and disability has strained the ability of health care systems to provide needed care. In Canada, the proportion of the population reporting unmet need for health care has risen dramatically and socioeconomic disparities in unmet need have been reported despite universal coverage. We assessed factors associated with unmet need and determined the contribution of chronic illness and disability to patient reported unmet need in a single payer system.

Study Design: We analyzed data from the Ontario component of the 2000/2001 Canadian Community Health Survey (CCHS) Cycle 1.1), a nationally representative cross-sectional survey of the Canadian community-dwelling population. The survey response rate was 84.7%. The CCHS allowed us to examine a comprehensive set of factors that may contribute to unmet need for health services including sociodemographic characteristics, mental and physical health, psychosocial factors, health behaviors, and social determinants of health including deprivation and community engagement. A series of multivariable logistic regressions were conducted to assess the independent association of the following measures of chronic illness and disability: diagnosis with common specific chronic conditions including CHF, CAD, diabetes, asthma depression; number of chronic conditions; ADL limitations; activity restrictions; and global health to unmet need after adjusting for potential confounders. Results are weighted to produce estimates for the Ontario population. To account for survey design, all confidence intervals and p-values were determined using bootstrapping.
Population Studied: Respondents aged 25 or older residing in Ontario to the 2000/2001 Canadian Community Health Survey, n=30,723; weighted n=7.8 million.
Principle Findings: Respondents had a mean age of 48 years, were 48.5% male, 32.8% foreign-born, and 16.9% visible minorities. Although low-income individuals were more likely than high-income individuals (15.4% vs. 11.3%) to report unmet need, it was the sickest respondents who were at the greatest risk, i.e., 29% of respondents in poor health. In adjusted analyses, all measures of health and functional status, but not income, were strongly associated with unmet need including poor health (OR 8.4, 95% CI 6.7, 10.5), > 3 chronic conditions (OR 4.4, 95% CI 3.7, 5.2), and IADL/ADL limitations (OR 3.2, 95% CI 2.8, 3.7). Individuals reporting any one of nine chronic conditions or depression were two to three times as likely to experience unmet need. For example, respondents reporting heart disease were twice as likely (OR 2.0, 95% CI 1.7, 2.5) and those with depression nearly three times as likely (OR 2.9, 95% CI 2.5, 3.3) to report unmet need. Global health, chronic illness, and disability were independently associated with unmet need, as were gender, depression, stress, tobacco use, food insecurity, and community engagement.
Conclusions: Despite universal health insurance, Ontarians with chronic illness and disability are at significantly increased risk for experiencing unmet need. Small differences in unmet need associated with income are explained by worse health status among low-income respondents.
Implications for Policy, Practice or Delivery: Universal health insurance minimizes socioeconomic disparities in access and is essential but not sufficient for assuring access for individuals with chronic illness and disability. There is further need for health system reform aimed at improving chronic illness care and reducing population risk for chronic disease.
Funding Source: Ontario Ministry of Health and Long-Term Care

- **Chronic Disease Treatment Rates in the U.S. and Europe**

David Howard, Ph.D., Katya Galactionova, M.A., Kenneth Thorpe, Ph.D.

Presented By: David Howard, Ph.D., Associate Professor, Department of Health Policy and Management, Emory University, 1518 Clifton Road NE, Atlanta, GA 30322, Phone: (404) 727-3907, Fax: (404) 727-9198,
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Research Objective: The U.S. spends far more on health care than any European country. Previous studies have sought to explain these differences in terms of system capacity, access to advanced technologies, gross domestic product, and prices. Differences in population health status and disease treatment rates have not been addressed in the literature on variations in spending, except as measures of system performance. Taking advantage of one of the first survey instruments to collect similar data in the U.S. and Europe, we document differences in treatment rates for major chronic conditions between the U.S. and Europe and estimate implications for health care spending.
Study Design: Observational.
Population Studied: Respondents to the 2004 Health and Retirement Survey in the U.S. (N = 18,580) and the 2004 Survey of Health, Ageing, and Retirement in Europe (N = 21,910). These surveys are designed to measure the characteristics of the non-institutionalized population age 50 and older. The following countries are represented in the European survey: Austria, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland. The surveys are designed to be comparable.

Principle Findings: U.S. respondents are much more likely to report having been told by a doctor that they have a major chronic condition, including diabetes (16.4% in the U.S. versus 10.9% in Europe), heart disease (21.8% in the U.S. versus 11.4% in Europe), high blood pressure (50% in the U.S. versus 32.9% in Europe), and cancer (12.2% in the U.S. versus 5.4% in Europe). The proportion of Americans using medications for each condition is also much higher. Using data from the 2004 Medical Expenditure Panel Survey to estimate the contribution of each disease to per capita spending, we calculate that if treatment rates for Americans were at European levels, personal health care spending among the elderly would decline by 13.3%.
Conclusions: Americans are more likely than Europeans to receive treatment for chronic conditions. A key question for future research is whether Americans are actually sicker or whether differences in treatment rates reflect variation in screening and detection practices. Based on differences in obesity rates between the U.S. and Europe, it would seem that at least a portion of the differences in prevalence rates is attributable to poorer underlying population health status in the U.S. At the same time, there are large differences in prevalence rates for cancer, which is not strongly associated with obesity. Americans are more likely to be screened for cancer, suggesting that screening practices play an important role in explaining cross-national treatment rates.
Implications for Policy, Practice or Delivery: Differences in population health status may explain a portion of the difference in per capita health care spending between the U.S. and Europe. Understanding whether persons with mild, asymptomatic disease are overtreated in the U.S. or undertreated in Europe is important for gauging the efficiency implications of higher spending the U.S.

Prevention & Treatment of Chronic Illness: Role of Communication & Adherence

Chair: Lisa Iezzoni, M.D., M.Sc.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

▪ Adherence to Hypoglycemic Medications is Associated with Hospitalization for Metabolic Decompensation

Drew Helmer, M.D., M.S., Mangala Rajan, M.B.A., Leonard Pogach, M.D., M.B.A.

Presented By: Drew Helmer, M.D., M.S., Physician/Researcher, Center for Healthcare Knowledge Management, VA-New Jersey Health Care System, 385 Tremont Avenue (129), East Orange, NJ 07018, Phone: (973) 676-1000, Fax: (973) 395-7111, Email: helmer@njneuromed.org

Research Objective: For people with diabetes, metabolic decompensations (MDs) are costly and serious complications which are considered preventable. Oral hypoglycemic medication adherence has been associated with any-cause hospitalization in people with diabetes and insulin gaps have been associated with MDs. We examined the relationship between hypoglycemic medication adherence and hospitalization for MD.
Study Design: A retrospective case-control study using merged Veterans Health Administration (VHA) inpatient and outpatient care, laboratory, and pharmaceutical data and Medicare claims data. Cases (n=2,714) were individuals hospitalized with MD in 2000 in VHA or Medicare data. Each case was matched to four controls (n=10,856) by age and gender who were not hospitalized with MD and were alive at the hospitalization date of the matched case (index date). An individualized look-back period of 365 days preceding the index date was constructed for each individual. Individuals were classified into one of four treatment regimens (sulfonylurea alone (n=3,131), sulfonylurea and metformin (combined oral regimen (n=1,879)), intermediate-acting insulin alone (n=649), and intermediate- and short-acting insulin (combined insulin regimen (n=1,896))). The remainder took no hypoglycemic medications (n=3,103) or other regimens (n=2,912) and were excluded from analyses. We calculated medication adherence as defined by the Medication Possession Ratio (MPR=the number of days prescribed/365 days in the look-back period) for each class of medication (sulfonylureas, metformin, short-acting insulin, and intermediate-acting insulin). We controlled for other independent variables including hemoglobin A1c level, race, marital status, VHA priority status, Medicaid enrollment, Medicare enrollment, and presence of infection, trauma, coronary artery disease, stroke, renal disease, peripheral vascular disease, and serious mental health condition. Separate logistic regression models for each treatment regimen were used to determine the association between MPR and hospitalization for MD, controlling for other independent variables. ANOVA was used to determine the bivariate differences in mean

MPR between cases and controls by treatment regimen.
Population Studied: Veterans enrolled in the VHA with diabetes in fiscal years 1999-2000.
Principle Findings: The mean MPR for each medication class ranged from 65.5% for short-acting insulin within the combined insulin regimen to 81.9% for sulfonylurea within the combined oral regimen. In bivariate analysis, the control's mean MPRs were significantly higher than cases' for all medications in all regimens ($p<0.05$). Controlling for other variables, higher MPR was associated with lower probability of hospitalization for MD in all regimens (Odds Ratios ranged from 0.46 to 0.65, $p<0.05$) except for intermediate-acting insulin within the combined insulin regimen, which was not statistically significant.
Conclusions: Adherence to hypoglycemic medications is not high in veterans with diabetes. Higher adherence is associated with reduced probability of metabolic decompensations. Within a treatment regimen, adherence to different classes of medications may differ and have different relationships to hospitalization for MD.
Implications for Policy, Practice or Delivery: Medication adherence is an important independent risk factor for hospitalization for MD in people with diabetes. Responsible stakeholders, including individuals, providers, healthcare delivery systems, and public health officials, should prioritize efforts to improve medication adherence.
Funding Source: VA

- Cervical Cancer Screening Test– Can Educational Materials Increase Adherence Rates?

Irena Pesis-Katz, A.B.D., Ying Xian, Laura Ferris, R.N., Kathy Riegel, Norm Lindenmuth, M.D.

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Research Objective: The cervical cancer goals described in Healthy People 2010 include screening of 97% of the women aged 18 years and older at least once and screening of 90% of the women in the preceding 3 years. However, the compliance with recommended screening is far below acceptable levels. The objective of this study is to evaluate the impact of member reminders and educational mailings as well as physician reminders on cervical cancer screening test rates in the non-compliant population.
Study Design: The study was designed as a randomized controlled trial. The non-compliant population was randomly assigned to three intervention groups and one control group. Group A1 included a physician intervention only – physicians received a list of their non-compliant patients. Group A2 included both a physician and a member intervention – the physicians received a list of their non-compliant patients and the members received a letter and an educational brochure. Group B1 included a member intervention only – a letter and an educational brochure. Group B2 was used as the control group – 'do nothing' approach. A two-phase randomization was used. First, physicians were randomized by their number of patients, their specialty, and their patient characteristics. Then patients within each physician's practice were randomized based on their characteristics. The study used Health Plan Employer Data and Information Set (HEDIS) specifications to define cervical cancer screening. Screening rates for a four-month period were used to compare the four groups. The intervention started on 11/15/2005 with a follow-up period through 03/31/2006.
Population Studied: The study included all women who did not have at least one cervical cancer-screening test within the last three years enrolled in BCBS plan (commercial HMO and Medicaid) in the Central New York region. The sample size was 2,307 non-compliant women.
Principle Findings: The findings from this study suggest that (1) sending educational materials to non-compliant members or (2) sending physicians a list of their non-compliant patients or (3) doing both do not lead to better results than doing nothing to improve cervical cancer screening rates. The difference among the four groups was less than 1.5% in compliance rate, which does not reach statistical significance. These results are true only for the non-compliant patient population.
Conclusions: Interventions that included mailings of educational materials to non-compliant members or their physicians do not seem to increase the compliance rates for cervical cancer screening tests.
Implications for Policy, Practice or Delivery: Since many Health Maintenance Organizations invest significant dollars and effort in educational interventions, it is important to understand the impact and significance of such interventions, especially in the non-compliant

population. This study suggests that sending educational information and reminders to members as well as sending reminders to their physicians do not change member compliance rates. Different approaches need to be considered to make a significant impact on the compliance rates for cervical cancer screening tests.

Funding Source: Excellus BCBS

- **Adherence to Medications for the Treatment of Congestive Heart Failure and its Effect on Medicaid Expenditures**

Ann Bagchi, Ph.D., Dominick Esposito, Ph.D., Myoung Kim, Ph.D., James Verdier, J.D., Deo Bencio, M.S.

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Research Objective: Congestive heart failure (CHF) is one of the most prevalent and costly chronic medical conditions affecting Medicaid beneficiaries. Few studies have examined CHF drug treatments within the Medicaid population. This study sought to: (1) determine the rate of CHF drug use among Medicaid beneficiaries with CHF in four study states, (2) estimate CHF medication adherence rates, and (3) estimate the overall costs of health care, comparing those with high adherence rates to those with low rates.

Study Design: The study used 1998 State Medicaid Research Files, 1999 Medicaid Analytic eXtract files, and 1999 Medicare claims data for four states (Arkansas, California, Indiana, and New Jersey) to identify Medicaid beneficiaries with CHF and examine their use and adherence to CHF drug therapy. Patient adherence was estimated using the medication possession ratio (MPR) and a measure of medication persistence. Multivariate logistic and linear regression models were estimated to examine the factors associated with CHF drug use and treatment adherence. The study analyzed inpatient stays using negative binomial regression and overall health care costs using a two-stage model to account for patients with zero costs and skewness in the cost data.

Population Studied: The study included all adult Medicaid beneficiaries with CHF in the four study states, including Medicaid-Medicare dual eligibles. Nursing facility residents were excluded because treatments for nursing home residents are more closely monitored than for community-based beneficiaries and, therefore, the two groups are likely to have different adherence patterns.

Principle Findings: Overall, 45,572 adult Medicaid beneficiaries were diagnosed with CHF. Approximately 85 percent of these beneficiaries had claims for some type of CHF drugs. Sixty percent of those without a drug claim were dual eligibles. Among those taking CHF drugs, the mean number of claims per month was 1.4 and 26 percent had more than four claims per month. The average MPR was 71.9% (median of 82.8; standard deviation of 44.4) and average days of medication persistence were 24.8 per month. Men, ethnic minorities, dual eligibles, patients with hospital admissions for conditions other than CHF, and beneficiaries with high Chronic Illness and Disability Payment System (CDPS) scores were less likely to have a CHF drug claim and had lower medication adherence rates. Patients with MPR rates at or above 80 percent had lower annual health care costs ($19,606 versus $25,740; $p < 0.001$) and a lower likelihood of hospitalization (2.7 percent less likely; $p < 0.001$).

Conclusions: Although the characteristics of patients with CHF varied widely across study states, the majority of Medicaid beneficiaries with CHF received drugs to treat their condition. Beneficiaries with higher adherence rates had lower annual costs and fewer hospitalizations per year.

Implications for Policy, Practice or Delivery: Improving adherence to CHF drug therapy can enhance patient health status and has the potential to reduce spending on other types of treatments. State Medicaid agencies and Medicare prescription drug plans that cover beneficiaries with CHF and other chronic conditions should develop targeted interventions that encourage better adherence among beneficiaries with CHF, particularly among men under the age 65, ethnic minorities, dual eligibles, and patients with poor overall health status.

Funding Source: CMS

- **The Role of Communication in Patients' Comprehension and Sense of Control over Chronic Heart Disease**

Holly Mead, Ph.D., Karen Jones, M.S., Marsha Regenstien, Ph.D., Bruce Seigel, M.D., M.P.H.

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Research Objective: Research shows that self-management of chronic conditions is critical to improving health outcomes. How to encourage and enable self-management, however, is less understood. Strong patient/provider communication is clearly an important factor. The purpose of this study is to explore the relationship between patient/provider communication and patients' comprehension of their disease and their sense of control over their condition.
Study Design: Data were collected from a cross-sectional patient survey examining heart patients' experience with their heart care. The survey used validated questions from national surveys, including the Consumer Assessments of Healthcare Providers and Systems (CAHPS) Hospital Survey and the National Health Interview Survey (NHIS).
We identify three domains of the provider/patient encounter related to quality communication: 1) provider information-giving; 2) provider listening; and 3) provider involving the patient in the management of his/her care. We use logistic regression to examine whether these domains of communication are associated with two dependent variables: 1) patient comprehension of disease and 2) patients' sense of control. Income, education, race and insurance status are included as controls in the models.
Population Studied: We conducted our survey on 1,148 patients with diagnoses of either HF or AMI, who received care in 10 hospitals involved in a cardiac care quality improvement initiative focusing on racial and ethnic disparities. Thirty-nine percent of the population is over age 65 and 54 percent earn annual incomes below $25,000. Twenty percent of patients are Hispanic, 31 percent are black and 43 percent are white.
Principle Findings: All three communication variables are significantly related to patients' ability to understand their heart disease. Patients who felt their providers always provided adequate information, always listened to them and always involved them in their care were 45 to 50 percent more likely to understand their condition and feel able to care for it than patients who reported their physicians never achieved these goals (p=.02, p=.02, p=.04, respectively). Patient involvement was the only variable significantly associated with patients' sense of control over their condition. Patients who felt their provider always involved them in their care were 57 percent more likely to feel they had control over their condition than patients who felt their provider never involved them (p=.03).
Conclusions: Two principal points emerge from our analyses. Strong patient/provider communication is strongly associated with patients having a better understanding of their chronic conditions. However, if the goal is to empower patients to better manage their condition, providing information and listening to patients is not sufficient. Patients' sense of involvement in their care is the only communication factor that significantly influences patients' sense of control over their disease.
Implications for Policy, Practice or Delivery: Providers may feel that they communicate well with their patients; however, unless they are actively involving them in the management of their care, patients are less likely to feel they are in control of their condition. Because patient empowerment is crucial to getting patients involved in the self-management of their care, providers must take a communications approach that engages their patients and facilitates their active participation in their care.
Funding Source: RWJF

- **Measuring Health Literacy in Context: The Rapid Estimate of Adult Literacy (REAL) - HIV**

Chandra Y. Osborn, Ph.D., Terry C. Davis, Ph.D., Michael S. Wolf, Ph.D., M.P.H.

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Research Objective: The Institute of Medicine has recommended developing tools to more accurately measure health literacy since existing instruments that have been used in health care research and clinical practice only measure general literacy skills as framed within a healthcare context. Limited literacy has previously been found to be associated with poorer rates of HIV treatment knowledge, and medication adherence. The objective of this study was to develop a disease-specific assessment of health literacy in the context of HIV treatment, and to determine if the more

tailored measure would better predict medication adherence behaviors compared to a more general literacy test.
Study Design: We recruited patients who were HIV-infected, prescribed >1 antiretroviral medication, and receiving outpatient care at infectious disease clinics at Northwestern Memorial Hospital (Chicago, IL) and the Louisiana State University Health Sciences Center (Shreveport, LA). Structured in-person interviews were conducted in a private room at each respective clinic immediately prior to patients' scheduled physician visits. Information gathered pertained to patient demographics, medication adherence, general health literacy, and HIV treatment literacy.
Population Studied: There were 204 patients in the study (age, M= 40.1, SD=9.2): 80% were male, 45% were African-American, 60% were unemployed, 40% had a household incomes <$800/month, 28% carried no health insurance, over 60% reported at least some college education, and over 70% were taking three or more HIV medications. More than half (53%) of all patients were also receiving treatment for a non-HIV related chronic illness. Approximately one third of patients had limited literacy skills.
Principle Findings: Psychometric analyses identified two factors pertaining to HIV treatment: information (3 items) and action (5 items). The 8-item REAL-HIV proved to have high internal consistency (Cronbach's a = 0.74) and construct validity according to principal components analysis. Lower scores on the REAL-HIV were independently associated with poorer rates of HIV medication adherence (Scores 4-5 (out of 8): Adjusted Odds Ratio (AOR) 2.6, 95% Confidence Interval (CI) 1.9-3.6; Scores 0-3, AOR 11.4, 95% CI 8.2-15.9). The REAL-HIV was more strongly associated with HIV medication adherence than the Rapid Estimate of Adult Literacy in Medicine (REALM), a general literacy measure often used in health care settings.
Conclusions: To our knowledge, the REAL-HIV is the first psychometric tool geared towards measuring HIV treatment literacy among HIV infected persons. Our findings suggest that the two-factor solution, HIV treatment understanding and action, offers a parsimonious and reliable measure of context-specific health literacy. The REAL-HIV is a psychometrically-sound tool for assessing health literacy in HIV care, and may be more useful than general literacy measures within this context.
Implications for Policy, Practice or Delivery: In contrast to general health literacy measures, the REAL-HIV asks patients with HIV to respond to HIV-related questions that include basic treatment terms that are routinely discussed throughout the course of care. Answers to these questions would offer providers useful information about patients' level HIV treatment knowledge, medication misunderstanding, or barriers to adherence; and allow for teachable moments to occur around the administration of the test. In addition, measurement content that has direct relevance to patients' treatment may minimize patients' resistance to being assessed.
Funding Source: CDC

Private Health Insurance

Private Health Insurance: Payment, Provision & Regulations

Chair: Anthony Lo Sasso, Ph.D.

Sunday, June 3 • 11:00 a.m.-12:30 p.m.

▪ Prescription Drug Cost-Sharing among Commercially-Insured Children and Adults with Chronic Illness

Teresa Gibson, Ph.D.

Presented By: Teresa Gibson, Ph.D., Director, Research Division, Thomson Medstat, 777 E. Eisenhower Parkway, Ann Arbor, MI 48108, Phone: (734) 913.3481, Fax: (734) 913.3850, Email: teresa.gibson@thomson.com

Research Objective: Most studies examining the effects of cost-sharing on prescription drug utilization among commercially-insured enrollees focus on adults or employees. Few examine the effects of higher prescription drug cost-sharing on children, although they are subject to the same cost-sharing provisions as adults. Children also are dependent upon parents to receive medical services and prescription drugs, acting in conjunction with physicians as agents in mediating the organizational and economic aspects of the health care delivery system. We examine the effects of prescription drug cost-sharing on prescription drug utilization for children and adults diagnosed with persistent asthma.
Study Design: A repeated cross-section design was used to study the effects of prescription drug cost-sharing on asthma drug utilization. Multivariate one and two-part models were estimated to assess the effects of cost-sharing on asthma drug use. Dependent variables

included any asthma drug use, number of asthma prescriptions, and number of prescriptions conditional on use. Standard errors were adjusted for clustering by patient for patients appearing in more than one year of the study.
Population Studied: The 2000 through 2003 MarketScan database was the data source, representing the health care experience of enrollees in employer-sponsored health plans in the U.S. The study population consisted of 22,985 children 5 to 17 years old who were diagnosed with asthma, meeting the HEDIS denominator criteria for persistent asthma in 2001 or 2002. The health care experience of 56,381 adults 18 to 54 years old with persistent asthma was also examined.
Principle Findings: Higher copayments for asthma prescription drugs did not affect the use of asthma prescription drugs for children with asthma (any use, number of prescriptions or number of prescriptions conditional on use ($p > .10$)). Conversely, adults with asthma were price-sensitive to copayments for asthma drugs on all measures of use ($p < .01$). These findings also held for children and adults who were diagnosed with asthma in both years. In addition, parents who had children with asthma tended to be less price-sensitive than other adults.
Conclusions: Parents act as agents for their children in the provision of healthcare. Commercially-insured parents in employer-sponsored health plans may be less sensitive to prescription drug prices, and may err on the side of caution by providing medications to their children.
Implications for Policy, Practice or Delivery: Higher copayments for children with asthma may not affect the utilization of prescription drugs, as parents may seek to act in the best interests of their children. Prescription drug copayments may not impede care for chronically-ill children but may create a financial burden for families, especially the working poor.
Funding Source: Thomson Medstat

▪ Trends and Determinants of Self Insuring Employer Health Benefits 1997-2004

Philip Cooper, Ph.D., Kosali Simon, Ph.D.

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Research Objective: 1) To analyze trends in rates of self insurance of employer health benefits from 1997 to 2004 using a large, nationally representative survey of roughly 25,000 private sector employers. 2) To assess the impact of state insurance regulation (mandated benefits, small group insurance reforms, premium taxes and stop-loss laws) on self insurance, a topic not previously studied using data spanning this recent time period.
Study Design: We analyze data from repeated cross-sections of the Medical Expenditure Panel Survey -Insurance Component List Sample, which ascertains whether an employer offers health insurance and if so, collects detailed information on up to four health plans. The survey also contains information on employer and employee characteristics. We create two indicators at the establishment level that measure 1) whether the establishment offers any self-insured plans and 2) if all plans are self-insured. We merge in data from various sources on state regulation of mandated benefits, state small group reforms, premium taxes and stop loss regulation, and characteristics of the local labor and health insurance markets. For the first research objective, we present trends in our two indicator measures of self insurance by firm size and sector. We then estimate econometric models of these measures to examine the impact of state regulation, employer and employee characteristics and factors such as managed care penetration, industry concentration, and unemployment rates on employers' decisions to self-insure. We also use these models to econometrically decompose the change in self insurance over this time period into its determinants.
Population Studied: Private sector establishments in the US.
Principle Findings: Among private sector establishments that offer health insurance, the percent that self insure at least one plan has increased from 28.5% in 1996 to 32.1% in 2002 (MEPS IC Net at http://www.meps.ahrq.gov/MEPSNet/IC/MEPSnetIC.asp). (We have access to micro data through 2004 for the analysis.) Our work will analyze the heterogeneity in this trend by firm size and across sectors, and look at the impact of state regulations and other factors on employers' decisions to self insure.
Conclusions: Our research findings will address the relative contribution of state regulation vs. economic climate, managed care penetration, and the change in the mix of businesses on the overall trends in self insurance.

Implications for Policy, Practice or Delivery: Many of America's uninsured work for firms that do not offer health insurance. Some have suggested that small and medium sized firms do not have access to low-cost health insurance for a variety of reasons, including their inability to self insure and thus avoid costly state level regulations. Our work will show the extent to which state regulation and other factors are determinants of self insurance in recent years.

- Evaluation of the Dutch Risk Equalization system: Are the Insurers Confronted with Predictable Losses for the Chronically Ill?

Wynand PMM Van de Ven, Professor, Pieter J Stam, D.R., Rene CJA van Vliet, D.R.

Presented By: Wynand PMM Van de Ven, Professor, Profesor of Health Insurance, Health Policy and Management, Erasmus University Rotterdam, PO BOX1738, Rotterdam, 2317 NG, Netherlands, Phone: + 31 10 4088556, Email: vandeven@bmg.eur.nl

Research Objective: Since 2006 everyone in the Netherlands must buy private health insurance from one of the competing insurers. A risk equalization system should sufficiently compensate the insurers for the differences in portfolio mix regarding the age, gender and health status of their insured. The current (2007) risk equalization formula in the Netherlands is predominantly based on age, gender, urbanisation, disability, Diagnostic Cost Groups (DCGs) and Pharmacy-based Cost Groups (PCGs). The regulation requires open enrollment and community rating. In case of insufficient risk equalization insurers are confronted with predictable losses on the chronically ill. These losses create incentives for risk selection, which can have several adverse effects.
Objective: To evaluate the risk equalization system. The following research questions will be answered: 1. Are there identifiable subgroups of consumers with predictable lossses? 2. If so: How large are these subgroups? And how large are the predictable losses? In particular we focus on subgroups of persons with a chronic condition or with above average utilization rates in previous years.
Study Design: We used the following data base: all information in the files of a large insurance company over the period 1997 - 2004 combined with an individual health survey (held in 2001) with many questions about the insureds' health status. In total some 17,000 observations. We were able to apply the 2006 and 2007 risk equalization formulae to simulate predictions of the insureds equalization-payments for the years 2003 respectively 2004. By comparing these predicted expenditures with their actual expenditures we calculated the average profits and losses for many identifiable relevant subgroups.
Population Studied: We used the following data base: all information in the files of a large insurance company over the period 1997 - 2004 combined with an individual health survey (held in 2001) with many questions about the insureds' health status. In total some 17,000 observations.
Principle Findings: Many subgroups of chronically ill that can be easily identified by the insurers, generate substantial predictable losses. The size of these subgroups ranges from less than 1% to 30%. The predictable losses are in the order of hundreds to thousands euros per person per year. The results indicate predictable losses also for subgroups of insureds whose disease was included as a risk adjuster in the risk equalization formula (e.g. heart problems, cancer and rheumatism). The improvements in the 2007-formula relative to the 2006-formula result in an average reduction of about 10% of the predictable losses.
Conclusions: The current (2007) risk equalization in the Netherlands compensates the insurers insufficiently for many identifiable high risk groups. In particular those insurers who make themselves attractive for the chronically ill e.g. by providing or contracting the best care for them, are insufficiently compensated. Consequently these insurers have to raise their premium which worsens their market position, in particular relative to insurers who have a low premium because they are successful in risk selection. Although there is an open enrolment requirement, insurers in the Netherlands have many tools for subtle forms of risk selection at their disposal. This risk selection can have many adverse effects in terms of affordability, efficiency and quality of care.
Implications for Policy, Practice or Delivery: A substantial improvement of the risk equalization system needs a high priorty. With an insufficient risk equalization system the disadvantages due to risk selection may outweigh the advantages of a competitive market.
Funding Source: Dutch National Patient Consumer Organization (NPCF)

- Managed Care's Price Bargaining with Hospitals

Vivian Wu, Ph.D.

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Research Objective: To explain why managed care plans obtain lower prices. The observed lower prices that managed care plans pay for hospital services is consistent with three plausible hypotheses: (1) cost differences, because plans concentrate their patients at lower-cost hospitals; (2) price discrimination, where a hospital charges lower prices for plans with more elastic demand; and (3) managed care's price bargaining, whereby prices vary because insurers have different degrees of bargaining power.
Study Design: Use a unique panel dataset with actual hospital prices in Massachusetts between 1994 and 2000. I measure a managed care plan's bargaining clout by (1) the plan's overall size in the market, and (2) the plan's patient channeling ability using an index I developed.
Population Studied: General, short-term hospitals in Massachusetts.
Principle Findings: I find evidence supporting the bargaining hypothesis. Managed care plan incur lower expenditures not by using lower-cost hospitals differentially, but by obtaining lower prices within similar set of hospitals. Health plans that are large in the market can extract more discounts from all hospitals. As well, plans that have the ability to channel patients are able to obtain lower prices across hospitals. More importantly, the interaction of the two factors is critical in determining the final negotiated prices. However, insurers' bargaining position might be deteriorating toward the end of 2000.
Conclusions: Managed care plans in Massachusetts were able to use their bargaining power, by being large and being able to channel patients, to obtain price discounts for hospital services in 1994-2000. Although the estimated insurer size and channeling effects are small, the economic meaning is significant. It suggests that MC has introduced at least some degree of price competition to the hospital market in the 1990s. It also shows that in markets where managed care plans do not contract selective provider networks, patients-channeling within the network gives rise to plans' bargaining power vis-à-vis providers.
Implications for Policy, Practice or Delivery: The results have important implications for productivity in the health care sector. I find evidence that MC plans can obtain lower prices through bargaining. It implies that the productivity of the hospital sector may be improved if quality is not adversely affected. The findings also have implications for regulators of health plan mergers. Health plans are input buyers in the provider market and at the same time sellers in the insurance market. My results suggest that sheer increases in plan size do not directly translate into more bargaining power in their negotiation with hospitals. Regulators need to be cautious about insurer mergers, as the potential efficiency gains in the hospital market may be limited, while the increases in market power in the insurance market may lead to higher premiums to the consumers. Finally, these results also point to the need for health plans managers to balance the goal of increasing consumers' choice of providers against enhancing bargaining position in their price negotiation with providers.
Funding Source: AHRQ

Consumer-Directed Health Plans: What Do Recent Data Tell Us?

Chair: Kosali Simon, Ph.D.

Sunday, June 3 • 3:00 p.m.-4:30 p.m.

▪ Who Chooses Consumer-Directed Health Plans?

Susan Busch, Ph.D., Colleen Barry, Ph.D., Deron Galusha, Martin Slade, Mark Cullen, M.D.

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Research Objective: To reduce costs and encourage use of high value care, purchasers are experimenting with various incentive-based approaches to promote increased consumer involvement in health care decision making. Some employers have introduced new consumer-directed health plans options. The goal of these high deductible insurance products is to provide a financial incentive to encourage consumers to become more involved in health care purchasing decisions. The objective of this research is to study the characteristics of enrollees (e.g., demographics, previous health care spending, presence of chronic conditions) that selected a consumer-directed health plan when newly offered by one large U.S. employer.

Study Design: In January 2004, one large U.S. employer with over 40,000 employees in 22 states introduced a new health and welfare benefits program that gave employees a choice of five health plan options including a high-deductible Health Reimbursement Account (HRA). Using insurance claims (2002-2004) and enrollment data, we use logistic regression to examine the characteristics of enrollees choosing the HRA insurance option.
Population Studied: Employees of one large U.S. employer.
Principle Findings: We find substantial evidence of selection among enrollees choosing the HRA option. Adjusted results indicate that enrollees with chronic disease including diabetes (OR=0.35; p<.0001), asthma/COPD (OR=0.51; p<.003) and CHF/CAD (OR=0.27; p<.004) in the prior year were significantly less likely to choose the HRA option compared with other enrollees. Enrollees who were older (OR=0.38; p<.0001), non-white (OR=0.65; p<.0105) and those with high health care costs in the prior year (OR=0.21; p<.0001) were also significantly less likely to choose the HRA plan. Compared with workers with income less than $32,000/year, workers with incomes greater than $60,000/year were more likely to choose the HRA option (OR=3.05; p<.0001). Finally, we found that salaried workers were more likely than hourly workers to choose the HRA option (OR=2.75; p<.0001).
Conclusions: Prior research found only modest favorable health selection among early adopters of consumer directed health plans (Buntin, 2006). In this research, we identify much stronger evidence of associations between health status, income and prior year health spending than has been detected in earlier work.
Implications for Policy, Practice or Delivery: According to a recent survey, only seven percent of those employers providing health insurance to workers offer a high-deductible health plan option (Claxton, 2006). Recent policy changes including the establishment of tax-free health savings accounts with high-deductibles suggest that the share of employers offering such plans will increase in future years. This research indicates that studies evaluating the effects of these insurance products on health care utilization or health outcomes must carefully consider selection effects. Moreover, that higher income workers are much more likely to choose the CDHP option suggests the distributional effects of the tax treatment of these plans should be evaluated.

▪ The Effects of Consumer-Directed Health Plans on Utilization and Cost of Care

Anthony Lo Sasso, Ph.D., Lorens Helmchen, Ph.D., Willard Manning, Ph.D.

Presented By: Anthony Lo Sasso, Ph.D., Associate Professor, Health Policy and Administration, University of Illinois at Chicago, 1603 W. Taylor, Chicago, IL 60612, Phone: (312) 413-1312, Fax: (312) 996-5356, Email: losasso@uic.edu

Research Objective: Consumer-directed health plan (CDHP) has been lauded by some observers as the next great idea in health care financing and pilloried by others as the latest bad idea in health care financing. Despite the often extreme differences of opinion on the subject, two things are clear: CDHP has attracted considerable attention from employers and individuals, and there has been a striking lack of research on the effects of pairing a high deductible policy with a health spending account covering a portion of that deductible on use of services and overall cost of care. The purpose of this research is to determine empirically what the effects are of CDHP on health care utilization.
Study Design: Our research benefits from a unique data source and setting. We have acquired all administrative claims data and enrollment records from a consumer-directed health insurance company operating in select states in the US. The company operates almost exclusively in the small group market where its products are offered only as a total replacement option to small employers. The total replacement aspect of the setting (versus as an add-on to other health insurance options) enables us to bypass the selection issue that plagues the few other efforts to examine the impact of CDHP on health care use. We observe spending account levels, deductible levels, and cost-sharing requirements for the 4,614 companies offering the insurance company's products. Detailed claims are available for all enrollees, which in addition to traditional claims information (ICD-9 and CPT codes) also provide a running total of the remaining spending account balance. Moreover, 2144 (46%) of the companies are observed for multiple years.
Population Studied: Approximately 170,000 person years of data for small group enrollees in 4,614 companies.
Principle Findings: Statistical identification of the effects of spending account levels and other plan characteristics will be achieved by exploiting within-company variation over time in plan

characteristics; as such, companies and their enrollees will serve implicitly as their own controls given the plausibly exogenous changes in plan characteristics over time. Indeed, nearly 40% of companies observed for two or more years altered deductible or copayment levels; in addition, given roll-over of the unused spending account balances at the end of the contract year, spending accounts at the start of the contract year (and hence the amount that must be paid at full cost out-of-pocket between the deductible and the spending account) are variable as they represent past spending.

Conclusions: Our estimates will represent the first credible estimates of the pure effect of CDHP on health care use and cost without being clouded by uncertainties regarding the effect of selection.

Implications for Policy, Practice or Delivery: The policy implications of our findings are potentially quite significant as HSA legislation is likely to be closely scrutinized by the new Congress and employers and consumers are urgently looking for means of reducing their exposure to high health insurance premiums. Our findings will also provide the empirical basis needed to forecast trends in health care cost and utilization as more and more workers switch to CDHP-type plans, including the imminent introduction of Medicare Medical Savings Account plans.

▪ **What Really Happens After Enrollment in a Consumer Driven Health Plan? Utilization and Chronic Medication Persistency**

Kathleen Fairman, M.A., Heather Sundar, Pharm.D.

Presented By: Kathleen Fairman, M.A., Outcomes Research Consultant, Research and Product Management, Express Scripts, Inc., 13900 Riverport Drive, Maryland Heights, MO 63043, Phone: (602) 867-1343, Email: kafairm@express-scripts.com

Research Objective: Much published work on Consumer Driven Health Plans (CDHPs) is based on small/atypical samples or surveys with low response rates. This study assessed changes in prescription drug utilization from pre-to-post CDHP implementation in two large financial services sector employers.

Study Design: Pre-post with comparison group; enrollees choosing CDHP versus traditional insurance (TI). Employers A and B, respectively, implemented $2500 individual/$5000 family and $1100 individual/$2200 family structures on January 1, 2006. Utilization: Changes in payor's prescription expenditures (total and net of copayment), prescription claims, and generic claims were assessed for January-September 2005 versus January-September 2006. Difference scores were post-period minus pre-period values. T-tests assessed statistical significance of difference scores for CDHP versus TI. Linear regressions assessed coefficients for lower- and higher-deductible plan enrollment (with TI as reference category), controlling age, gender and Chronic Disease Score (CDS), a pharmacy claims-based measure of disease burden in adults. Chronic medication use: Persistency was measured in subsamples of enrollees filling at least one prescription for a chronic medication in ten therapeutic classes during November-December, 2005. Percentages of enrollees filling any claim(s) in the therapeutic class through Quarters 1 and 3 of 2006 were calculated, and CDHP versus TI enrollees compared using Pearson chi-square.

Population Studied: N=5300 CDHP, 8797 TI in Employer A; 1978 CDHP, 4218 TI in Employer B. Neither employer had special education for CDHP enrollees. All study subjects were continuously enrolled from January, 2005 through September, 2006. Mean CDSs were 28% and 17% lower for CDHP than TI enrollees in Employers A and B, respectively.

Principle Findings: For both employers, total scripts declined slightly (1%-4%) for CDHP enrollees, while increasing 8% for TI enrollees($p < .001$). Generic scripts increased for both CDHP and TI enrollees, but the amount of increase was bigger for the TIs($p < .01$). Payors' net drug costs for the CDHPs declined for both Employers A and B (62% and 24% respectively) and increased for the TI (18% and 10%, respectively). Findings persisted after controlling age, gender, and CDS. During Quarter 1, 2006, chronic medication persistency rates were lower for CDHC than TI enrollees in most therapeutic classes. By Quarter 3, these trends continued but moderated. For example, for Employer A, Quarter 1 persistency rates for HMG medications were 82% and 70% for TI and CDHC enrollees, respectively($p<.01$). By Quarter 3, rates were 96% and 91%($p<.01$). In both employers, difference sizes were inconsistent across therapeutic classes. Among members meeting deductible, examination of behavior before versus after first plan payment revealed no substantial changes in behavioral patterns. In Employer A, the generic fill rate was 46% before, 44% after; in Employer B the generic fill rate was 48% before, 46% after.

Conclusions: CDHP implementation is associated with substantial payor savings attributable to 1)lower overall utilization only partially offset by increased generic utilization; and 2)increased consumer cost-sharing. Declines in chronic medication use can occur soon after implementation but tend to moderate through the year.
Implications for Policy, Practice or Delivery: CDHPs can produce positive cost outcomes but need to be managed with educational efforts to encourage greater generic substitution and continued chronic medication persistency.

- **Demand for High-Deductible and "Consumer-Directed" Health Plans**

Melinda Beeuwkes Buntin, Ph.D., Roland McDevitt, Ph.D., Cheryl Damberg, Ph.D.

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Research Objective: Enrollment in "consumer-directed" health insurance plans – plans with high deductibles that are frequently coupled with personal savings accounts -- has soared over the past four years and now exceeds 5 million. Approximately a third of firms offering health insurance benefits now offer a high-deductible plan and another third say they are interested in doing so. At the same time, prior studies have found that consumers prefer low-deductible plans, say they are willing to pay a premium for them, and are less satisfied when enrolled in high-deductible plans.
Study Design: This paper will explore the determinants of enrollment in consumer-directed plans using data from a survey of 40 employers offering high-deductible plans. The survey asks the employers for detailed information about their plan offerings, plan benefit designs, and enrollment levels; this includes information about both their consumer-directed option and any traditional HMOs or PPOs they may offer. It also asks about their consumer-directed plan implementation strategy and about resources available to help employees choose the best plan for them. Finally, it asks about the information tools and programs offered to employees to help them to manage their own health and health care utilization if they choose the consumer-directed option.
Population Studied: The sample of employers was stratified by the level of the deductible, the type of account offered (if any), and level of employer contributions to the account.
Principle Findings: We will explore the factors that are associated with higher levels of enrollment when consumer-directed plans are offered. These include plan benefit design elements such as deductible levels, coinsurance, deductible exemptions for preventive care, savings account availability, and employer contributions towards both premiums and accounts. They also include the sensitivity of enrollment to other strategies such as information and communications campaigns. While we will not explicitly calculate enrollment elasticities given our sample size, we will discuss the relative magnitudes of these effects and their implications.
Conclusions: The survey is in the field and will be completed in January.
Implications for Policy, Practice or Delivery: Our findings will be of use to policymakers interested in consumer-directed health plans and to employers potentially interested in offering them.
Funding Source: RWJF, California HealthCare Foundation

- **Who Chooses a Health Savings Account?**

Stephen Parente, Ph.D., M.P.H., Roger Feldman, Ph.D., Jon Christianson, Ph.D.

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Research Objective: Our research objective is to examine the demographic and plan characteristics that are associated with plan choices of a workforce from large national employer when they offered a Health Savings Account (HSA) as one of several competing health insurance options.
Study Design: Using discrete choice modeling methods, we estimated a multivariate model of health plan choice using theory, prior literature, and our descriptive analysis findings to guide the particular model specification. As a starting point, we estimated a conditional logistic regression model and test for whether the econometric assumptions are valid (e.g., independence of irrelevant alternatives). We later used a nested logistic regression model to control for IIA.

Population Studied: Our study population is a large national employer representing over 150,000 covered lives. This employer offered an HSA in 2006. We use prior claims data and human resources data from 2005 to examine the demographic and health status factors associated with HSA plan choice. The competing 2006 plan choice set included four or more other variants of preferred provider organizations and, in some locations, an HMO. In addition, a Health Reimbursement Account (HRA), another variant of consumer driven health plan (CDHP) plan design, was offered in all US regions in 2005 and 2006. This enabled us to examine CDHP switching between HRA and HSA.
Principle Findings: We find significant favorable selection into the HSA. In addition there was considerable unfavorable selection into the HRA. Income has a large and statistically significant effect on plan choice. In early estimates, we find significant differences in the price elasticity of coinsurance and deductible where coinsurance is significantly more elastic.
Conclusions: The introduction of HSAs by employers could split the risk profile of enrollees of consumer driven health plans witnessed in the early years of CDHP adoption (2001-2004). Employers should be aware that very different populations are selecting HSAs and should monitor the comparative impact on health care cost and utilization across all plan designs.
Implications for Policy, Practice or Delivery: Future government incentives that encourage the growth of HSAs need to consider their net impact on total expenditures. Our results suggest employers may be cost neutral from the introduction of HSAs due to significant favorable selection for this plan design.
Funding Source: RWJF

Quality: Measuring & Improving Quality

Quality of Ambulatory Care

Chair: Ateev Mehrotra, M.D., M.P.H.

Monday, June 4 • 9:00 a.m.-10:30 a.m.

▪ Does Managed Care Affect Quality? Appropriateness, Referral Patterns, and Outcomes of Carotid Endarterectomy

Ethan Halm, M.D., M.P.H., Matthew J. Press, M.D., Stanley Tuhrim, M.D., Jason Wang, Ph.D., Mary Rojas, Ph.D., Mark R. Chassin, M.D., M.P.P., M.P.H.

Presented By: Ethan Halm, M.D., M.P.H., Associate Professor, Medicine and Health Policy, Mount Sinai School of Medicine, One Gustave Levy Place, Box 1087, New York City, NY 10029, Phone: (212) 241-0326, Fax: (212) 831-8116, Email: ethan.halm@mountsinai.org

Research Objective: Managed care (MC) plans have financial and quality incentives to prevent overuse of procedures, steer patients to high quality providers, and prevent poor outcomes. This study sought to assess the impact of MC on several dimensions of quality of surgical care among Medicare beneficiaries with MC and Fee-For-Service (FFS) insurance undergoing carotid endarterectomy (CEA). CEA is an apt tracer procedure because it is a common type of major vascular surgery, almost always elective, and there is a strong evidence base of RCTs and national practice guidelines.
Study Design: This was a population-based, observational cohort study of all CEAs on performed on Medicare MC and FFS beneficiaries during a consecutive 18 month period. Cases (ICD-9 38.12) were identified using Medicare Part A claims and NY State hospital discharge databases. Insurance status was based on Medicare eligibility files and hospital admission records. Clinical data were abstracted from medical charts to assess appropriateness and outcomes. Appropriateness was based on a national RAND appropriateness expert panel. Deaths and strokes within 30 days of surgery were confirmed by 2 physicians. Differences in patients, appropriateness, provider volume, complication rates, and outcomes were compared using chi square tests. Differences in risk-adjusted rates of death or stroke were compared using multivariate logistic GEE regression and a validated CEA-specific risk model.
Population Studied: All CEAs on Medicare MC and FFS beneficiaries performed during the period January 1998 through June 1999 in NY State. 9588 cases were performed by 488 surgeons in 166 hospitals.
Principle Findings: MC(N=897) and FFS(N=8691) patients were similar in age, sex, indications for surgery, disease severity, perioperative risk, and most major comorbidities. There were no differences in inappropriateness between MC and FFS(8.4% v. 8.6%,p=.55) or reasons for inappropriateness. MC patients were less likely to have CEA

performed by a high volume surgeon(20.1% v. 13.5%), high volume hospital(20.5% v. 13.0%), or low complication rate surgeon(63.3% v. 54.8%;p<.05 for all). There was no difference in the likelihood of being operated on by a vascular or general surgeon, the 2 most common types of surgeons performing CEA, or at a teaching hospital. There were no differences in unadjusted 30 day rates of death or stroke between MC and FFS cases(4.4% v. 4.2%,p=.81). Nor were there differences in 30 day risk-adjusted rates of death or stroke(Adjusted OR=0.97;95% CI, 0.69-1.37) even after accounting for differences in surgeon and hospital volume or geographic location.
Conclusions: While Medicare MC plans had the time, opportunity, evidence-based guidelines, and financial and quality incentives to rationalize the use of CEA, they did not appear to have any impact on overuse, referral to high quality providers, or clinical outcomes for this common, elective vascular surgical procedure.
Implications for Policy, Practice or Delivery: These results suggest a lack of alignment between theoretical MC plan financial and quality incentives and actual plan behavior. Improving the quality of elective, surgical care for Medicare beneficiaries will likely require more intense procedure-specific management controls or stronger economic incentives to prevent overuse and steer patients to high quality providers.
Funding Source: AHRQ, RWJ Foundation, CMS

▪ Aggressiveness of Imaging for Acute Low Back Pain in Elderly Patients

Hoangmai Pham, M.D., M.P.H., Catherine Corey, M.S.P.H., Deborah Schrag, M.D., M.P.H., Bruce E. Landon, M.D., M.B.A., Haya R. Rubin, M.D., Ph.D., James D. Reschovsky, Ph.D.

Presented By: Hoangmai Pham, M.D., M.P.H., Senior Health Researcher, Center for Studying Health System Change, 600 Maryland Avenue, SW, Suite 550, Washington, DC 20024, Phone: (202) 554-7571, Fax: (202) 484-9258, Email: mpham@hschange.org

Research Objective: Medicare spending on imaging services has escalated dramatically since 2000, with unclear clinical benefits for beneficiaries. Practice guidelines discourage routine imaging for acute low back pain (LBP), but allow discretion in decisions to image elderly patients. We examined variation in physicians' use of imaging for Medicare patients, and whether physician specialty and training, and the economic environment in their practices, are associated with aggressiveness of imaging.
Study Design: Analysis of 2000-2002 claims data on a representative sample of physicians and their Medicare patients. We modified a measure of inappropriate imaging for LBP developed by the National Committee on Quality Assurance, excluding patients with prior or concurrent diagnoses of cancer, infection, trauma, neurologic deficits, or constitutional symptoms suggestive of increased cancer risk. We focused on the first imaging study each beneficiary received following the LBP diagnosis, and characterized imaging as least aggressive (none within 180 days); moderately aggressive (imaging within 28-180 days); and most aggressive (within 28 days). Ordered logit regressions adjusted for beneficiary demographics and comorbidities in the prior year; physician and practice characteristics; financial incentives (performance-based payment and overall effect of incentives); and local supply of radiologists.
Population Studied: 25,291 Medicare beneficiaries with acute LBP receiving the plurality of their care during the study period from one of 3,337 primary care physicians in the nationally representative 2000-2001 Community Tracking Study Physician Survey. Patients were 65 years or older, continuously enrolled in fee-for-service, not institutionalized, and had no back pain diagnoses for the preceding six months.
Principle Findings: 33% beneficiaries with LBP were imaged within 28 days of diagnosis, and 5% between 28-180 days. Of these, 85% had a radiograph, while 6% and 16% had a CT or MRI scan as their initial study, respectively. (2% had multiple concurrent studies). Half of radiographs were performed in the physician's medical practice. Medicaid-eligible beneficiaries [OR 0.80 (0.70-0.92)], and those treated in practices with higher proportions of revenues derived from Medicaid [OR 0.90 (0.81-1.00) for >15% vs. <6%], were less aggressively imaged using any modality. Patients of family/general practitioners and non-board certified physicians were less aggressively imaged than those of general internists or board-certified physicians [ORs 0.92 (0.85-0.99) and 0.90 (0.80-1.00), respectively]. Beneficiaries were less aggressively imaged if their physicians reported that their overall financial incentives were to reduce services [OR 0.74 (0.63-0.86) relative to incentives to increase services], but there was no independent relationship between imaging and physicians' exposure to compensation based on quality

performance or patient satisfaction. We found a strong association between aggressiveness of imaging, and supply of radiologists. Results were similar when we considered only CT and MRI scans, and when we excluded beneficiaries whose initial LBP diagnosis was coded by a radiologist.
Conclusions: In contrast to findings based on underuse indicators of quality, physicians who treat more Medicaid patients, are not board certified, and those less specialized tend to image less aggressively.
Implications for Policy, Practice or Delivery: Less aggressive treatment may be to Medicaid patients' benefit, whether because of low reimbursement or other factors. Quality indicators focused on potential overuse may yield different performance assessments than those measuring underuse, and financial incentives supporting more vs. less aggressive patterns of care may have mixed effects on quality.
Funding Source: RWJF

- Creating Metrics to Foster Enhancement of Patient Centered Care in Primary Care Office Practice

Sarah Scholle, Dr.P.H., M.P.H., L. Gregory Pawlson, M.D., M.P.H., FACP, Judy Ng, Ph.D.

Presented By: Sarah Scholle, Dr.P.H., M.P.H., Assisstant VP, Research, NCQA, 2000 L Street, NW Suite 500, Washington, DC 20036, Phone: (202) 955-1726, Fax: (202) 955-3599, Email: scholle@ncqa.org

Research Objective: To develop and test performance metrics for patients centered care for use in quality improvement, benchmarking, and pay-for-performance efforts. In particular, additional metrics related to serving culturally and linguistically diverse populations and address disparities in care were also included.
Study Design: An expert panel was convened to identify and prioritize metrics for evaluating patient-centeredness in primary care. Building on a synthesis of the literature, previous definitions of patient-centered care, and input from key informants, potential domains and measures were reviewed by the panel. Measures were considered to evaluate how well practices are organized to support patient-centered care as well as the degree to which interactions between patients and physicians demonstrate patient-centeredness. Methods for testing the feasibility of metrics included surveys of practices about the presence of systems, site visits to evaluate the presence of systems and the feasibility of adopting patient-centered metrics, and interviews with physicians about the importance, feasibility, and acceptability of patient-centered performance metrics as the basis of pay-for-performance rewards.
Population Studied: Primary care practices serving adults and children. Field testing is occurring among practices currently involved in performance measurement activities, those involved in pay-for-performance programs and those that serve patient populations diverse in race or ethnicity and language needs.
Principle Findings: A total of 24 performance metrics evaluating systems that support patient centered practice were identified in six domains: access, communication, coordination, quality improvement, care management, and self-management. For example, measures assess whether practices have policies for responding to patient phone calls or other communication, systems to track tests, and efforts to support patients' self-management of their health, involve family members in care and make medical records available for patients. The availability of language services for patients with limited English proficiency, the use of systematic processes to assess patients' language, race and ethnicity, and performance measurement stratified by sub-populations are also evaluated. Patient-centered survey measures using the CAHPS Clinician and Group survey as the core were also identified. Methodological issues related to the use of surveys measures and feasibility issues in collecting data on patient-centered metrics are also addressed.
Conclusions: An initial set of measures for evaluating patient-centered care in primary care practice have been identified and tested. Many of the system metrics were adopted and are currently being used as part of NCQA's Physician Practice Connections program. These metrics offer a comprehensive approach for evaluating the achievement of patient-centeredness that could be used in a variety of efforts, including as the basis of payment reform to qualified practices and in pay-for-quality rewards programs.
Implications for Policy, Practice or Delivery: While there have been multiple formulations of overall concepts of patient centeredness, less effort has been given to the problems of creating reliable, valid and most especially actionable measures of patient centeredness. Efforts to align financial incentives and to address other barriers to patient-centered care are needed in order to encourage physicians to adopt patient-

centered structure and processes that improve patient experiences in the health care systems.
Funding Source: CWF

- **Development, Testing & Correlation with Selected Quality Measures, of a Survey Instrument to Assess Systemness in Office Practice**

Sarah Scholle, Dr.P.H., M.P.H., L. Gregory Pawlson, M.D., M.P.H., FACP, Leif Solberg, M.D., Sarah Shih, M.P.H., Steve Asche, M.S.

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Research Objective: To examine the relationship between systems and quality in medical practices.
Study Design: Surveys of medical groups about the presence and functioning of systems were correlated with effectiveness of care and patients experiences data. The Physician Practice Connections survey of practice systems was developed based on input from an expert panel, literature review and pilot testing. It assesses five domains from the Wagner chronic illness model: health care organization, decision support, delivery system design, clinical information systems and patient self management support. Data on clinical performance measures for diabetes care and patient experience data were obtained from the Minnesota Measurement Collaborative and the Massachusetts Health Quality Partnership.
Population Studied: Forty-one of 43 medical groups approached in Minnesota and 34 of 100 practices approached in Massachusetts completed the mail survey. All practices/groups were participating in regional quality measurement activities. Participating practices ranged in size, ownership, and population served.
Principle Findings: Significant correlations between specific practice systems and quality of care for diabetes were found in Minnesota. Clinical information systems, including use of registry, medical list, and test tracking systems among other items, was significantly correlated with testing among diabetics for hemoglobin A1c, correlation of 0.40, p-value 0.013, and for LDL, correlation of 0.46, p-value 0.003. Self-management support systems, including patient reminders, self-management plans, and risk factor screening among others, was also related to testing, with correlation of 0.33, p-value 0.04, for blood pressure testing and correlation of 0.28, p-value of 0.08 for Alc testing. Delivery system design, with items such as presence of primary care teams and scheduling for continuity, was correlated with nephropathy screening at 0.38, p-value 0.02. Optimal control rate, reflecting achievement of recommended levels of A1c, LDL, BP as well as use of aspirin and non-smoking status, was correlated with delivery system redesign at 0.37, p-value 0.02, self-management support 0.36, p-value of 0.02, and overall PPC score 0.29, p-value 0.07. Initial analyses suggest little or no correlation between presence of systems and surveys of patient experience of care. Further analyses using both datasets will be conducted.
Conclusions: Medical practices that report the presence and use of systematic practices to implement the Chronic Illness model achieve higher levels of performance on performance measures related to clinical testing and achievement of recommended levels for key clinical measures. The presence of systems does not appear to be related to improved patient experiences. More research is needed to understand which systems are likely to provide the greatest benefit in terms of quality and improved patient outcomes.
Implications for Policy, Practice or Delivery: Implementing systems to support achievement of the Chronic Illness Model has the potential to improve quality specifically for diabetes and potentially across a variety of conditions. Methods for assessing the presence of these systems are improving. Policy interventions to encouraging practices to invest in practice redesign and effective systems are needed.
Funding Source: RWJF

- **Do Patient Sociodemographic Characteristics Affect Primary Care Practice Sites' Performance on Quality Measures?**

Mark Friedberg, M.D., M.P.P., Dana G. Safran, Sc.D., Janice A. Singer, M.P.H., M.A., Kathy L. Coltin, M.P.H., Jie Zheng, Ph.D., Eric C. Schneider, M.D., M.Sc.

Presented By: Mark Friedberg, M.D., M.P.P., Fellow in General Internal Medicine, General Internal Medicine, Brigham and Women's Hospital, 667 Huntington Avenue, Boston, MA 02115, Phone: (617) 432-6814, Email: mark.friedberg@gmail.com

Research Objective: In recent years, measurement of primary care quality for public

reporting and as a basis for payment incentives has expanded dramatically in the United States. Prior research suggests that quality of care is lower for minority patients and those with lower incomes and lower educational attainment, raising the prospect that providers who care for disproportionate shares of such patients might incur a "performance measure penalty." Our objective was to assess the relationship between physician practice site scores on quality measures and site-level prevalence of patients from disadvantaged groups.
Study Design: The Massachusetts Health Quality Partners statewide reporting program supplied data on 8 Health Plan Employer Data and Information Set (HEDIS) measures collected from 241 physician practice sites (including 1,489 physicians) providing adult primary care to commercially insured patients during 2004. We linked these data to patient responses from the 2002-2003 Massachusetts Ambulatory Care Experiences Survey (ACES) in order to calculate the prevalence of sociodemographic characteristics (age, gender, race, ethnicity, and education) within each practice site's patient panel. Using the practice site as the unit of analysis, we calculated correlations between the prevalence of each sociodemographic characteristic and performance scores on each HEDIS measure using Spearman tests of statistical significance. Next, we constructed multivariable regression models predicting site scores on each HEDIS measure as a function of patient panel sociodemographic case-mix.
Population Studied: Primary care practice sites in Massachusetts.
Principle Findings: Sociodemographic characteristics varied among site patient panels on mean age (mean 48.9 years, range 37-56 years) and proportions of males (mean 38%, range 3%-82%), whites (mean 92%, range 54%-100%), blacks (mean 3%, range 0%-29%), Asians (mean 3%, range 0%-31%), Hispanics (mean 3%, range 0%-34%), and college graduates (mean 50%, range 20%-97%). Mean site-level HEDIS scores ranged from 43% for Chlamydia screening in women ages 21-25 (interquartile range 34%-52%) to 93% for LDL screening in diabetics (interquartile range 92%-97%). In bivariate analyses, lower site-level proportions of college graduate patients were significantly associated ($p<0.05$) with lower HEDIS scores on all 8 measures. These associations remained statistically significant for 7 of the 8 measures after multivariable adjustment. In multivariable models, higher site-level proportions of male patients were also associated with lower performance on 2 measures of women's health care (mammograms and Pap smears). Standardized coefficients derived from the multivariable models suggested that a one-standard-deviation decrease in the proportion of college graduate patients was associated with a performance score decrease of up to 2.5%. Significant bivariate associations between sites' HEDIS scores and the age, racial, and ethnic composition of their patient panels were present for Chlamydia screening, but these associations did not remain statistically significant after multivariable adjustment.
Conclusions: Primary care practice sites with disproportionate shares of patients having lower educational attainment may incur a "performance measure penalty" on widely-used HEDIS quality measures.
Implications for Policy, Practice or Delivery: Designers of performance reporting and pay-for-performance systems should address the potential impact of variation in the sociodemographic characteristics of patient panels on measures of clinical quality.
Funding Source: CWF, NRSA

Assessing Patient Experiences with Care: Measurement Issues & New Approaches

Chair: Robert Weech-Maldonado

Monday, June 4 • 11:00 a.m-12:30 p.m.

▪ Multimorbidity and Patients' Experiences with Care: What Is the Relationship?

Constance Fung, M.D., M.S.H.S., Claude Setodji, Ph.D., Fuan Yue Kung, Ph.D., Steven M. Asch, M.D., M.P.H., John Adams, Ph.D., Elizabeth A. McGlynn, Ph.D.

Presented By: Constance Fung, M.D., M.S.H.S., Physician/Natural Scientist, RAND/VA Greater Los Angeles/UCLA, 1776 Main Street, P.O. Box 2138, Mailstop M5S, Santa Monica, CA 90407, Phone: (310) 393-0411 x7370, Fax: (310) 260-8159, Email: cfung@rand.org

Research Objective: Evidence suggests that multimorbidity (multiple chronic conditions) may be associated with poorer care coordination and communication and that the presence of unrelated (discordant) conditions within a patient may make care more challenging. There is concern that performance of providers who care for patients with multimorbidity may be

misrepresented if pay-for-performance and other quality improvement programs do not account for multimorbidity when reporting patients' ratings of health care experiences. Also of concern is whether methods used to measure multimorbidity should account for the pathophysiological relationship among conditions (concordance) and lack of this relationship among other conditions (discordance). We examined in a large national sample the relationship between number of chronic conditions (accounting for discordant conditions) and patients' ratings of their health care experiences (continuity, coordination, and communication).
Study Design: We surveyed by telephone adults across the United States, interviewing them about their health care experiences and their health conditions. For this analysis, we used data from a single time point. Using confirmatory factor analysis, we constructed scales from the survey to represent three health care experience domains: continuity, coordination, and communication. We accounted for discordance among conditions by grouping conditions with the same pathophysiological risk profile and those within the same organ system. Then, we counted the number of groups represented in each participant. Three multivariable regression models predicted the effects of number of chronic condition groups on the three patient experience scales. Co-variables included age, gender, income, education, self-rated global health status, insurance, family structure, race/ethnicity, city, urban location, and number of visits. We repeated the same three models, replacing number of condition groups with a simple count of chronic conditions.
Population Studied: A random sample of 14,352 adults living in 12 metropolitan areas in the United States.
Principle Findings: In models that accounted for discordance, number of chronic condition groups (>=3 groups versus 0 condition groups) was only weakly predictive of communication (scale range 5-20; beta=-0.19, p=.034) and continuity (scale range 3-13; beta=0.14, p=.019) and was not predictive of coordination (p=.65). In models that used a simple count of chronic conditions, simple count of conditions was only weakly predictive of continuity ratings (beta=.034, p=.0038); simple count of conditions was not predictive of communication (p=.091) or coordination (p=.10).
Conclusions: Number of chronic conditions is a statistically, but not clinically significant predictor of patients' ratings of continuity, coordination, and communication.
Implications for Policy, Practice or Delivery: Counts of conditions, even when accounting for discordance, are not strongly predictive of better or worse patients' experiences with care. Future research should examine the effects of specific clusters of conditions on patients' ratings of care experiences.
Funding Source: RWJF

- **Developing and Testing Performance Measures for Language Services**

Marsha Regenstein, Ph.D., M.C.P., Jenny Huang, M.S., Holly Mead, Ph.D., Jennifer Trott, B.A., Cathy West, M.S., R.N., Bruce Siegel, M.D., M.P.H.

Presented By: Marsha Regenstein, Ph.D., M.C.P., Associate Research Professor, Health Policy, George Washington University Medical Center, 2121 K Street, NW, Suite 210, Washington, DC 20037, Phone: (202) 994-8662, Email: marshar@gwu.edu

Research Objective: In January 2006, the Joint Commission on Accreditation of Healthcare Organizations released standards and elements of performance to support the provision of culturally and linguistically appropriate health care services to individuals. While hospitals around the country are developing innovative strategies to improve language services, there are no uniform or commonly accepted measures of quality and performance for hospital-based language services. As a component of a hospital quality improvement collaborative, researchers at George Washington University developed performance measures for language services, focusing on efforts to improve efficiency, productivity, timeliness, and effectiveness in the provision of language services to patients.
Study Design: Language services performance measures were developed using a rigorous process, including multiple stages of review, pilot tests, and implementation by 10 hospitals selected through a competitive process to participate in a 16-month quality improvement learning network. The 10 hospitals are using these performance measures to test the effectiveness of interventions to improve quality of care for patients with limited English proficiency (LEP).
Population Studied: The performance measures are designed to be used in hospital settings, although they have applicability to other health care environments. The proposed measures

were reviewed by researchers, interpreter services directors, and clinical managers at hospitals with linguistically diverse populations. Prior to implementation by the hospitals in the learning network, the performance measures and quality improvement tools were field tested at two hospitals with linguistically diverse patients and busy language services programs. The 10 hospitals using the performance measures in the learning network are located in eight states across the country. Spanish is the most common language spoken by LEP patients at nine of the hospitals. Interpreter services contacts with patients range from approximately 25,000 to over 125,000 per year.
Principle Findings: Based on the stages of review and field tests, five performance measures were developed for testing within the learning network. These measures focus on the efficiency, effectiveness, timeliness, equity, and safety of hospital-based language services. For the first time, hospitals will be able to gauge the extent to which they are meeting the language needs of their patient populations, at the most critical points of care.
Conclusions: Performance measures are essential for improving quality and establishing benchmarks and standards for hospital-based language services. The measures developed for the learning network are the first step in establishing national standards and performance measures to help organizations assess and improve the quality of care provide to patients with LEP.
Implications for Policy, Practice or Delivery: The performance measures were developed for the first national quality improvement collaborative to combine established quality improvement techniques with the delivery of language services. Given the increased focus on the provision of linguistically appropriate care, the development of measures is necessary to provide hospitals with tools to assess their performance and develop strategies to improve overall health care experience for linguistically diverse patients.
Funding Source: RWJF

- Quantitative Relationship Between Patients' Experiences of Health Care and Clinical Performance Measures in Military Treatment Facilities

Samantha Sheridan, M.A., Kimya S. Lee, Ph.D., Shelley Perry, Ph.D., Margaret M. Class, B.S.N., Thomas V. Williams, Ph.D.

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Research Objective: The purpose of this study was to examine the relationship between patients' health care experiences, as measured by the 2004 TRICARE Management Activity (TMA) Inpatient Satisfaction Survey and hospital clinical performance indicators, as measured by ORYX Initiative data, sponsored by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).
Study Design: The main thrust of the analysis was to examine the relationship between the CAHPS Hospital Survey (H-CAHPS) domain-level composites and global ratings and the individual process and outcome indicators that make up the ORYX core performance measure sets. We tested the hypothesis that the H-CAHPS composites and global ratings are positively correlated with the ORYX individual indicators. To test our hypothesis, we calculated Pearson's correlations between each of the H-CAHPS composites and global ratings and each of the ORYX indicators
Population Studied: TRICARE Beneficiaries discharged from Military Treatment Facilities (MTFs) and civilian hospitals under purchased care arrangements
Principle Findings: H-CAHPS domain-level composites, H-CAHPS global ratings, and many of the ORYX individual clinical process and outcome measures were moderately to highly related, with correlations ranging from .35 to .74. The H-CAHPS composites, communication with doctors, and communication about medication were most often significantly correlated with the ORYX measures.
Conclusions: In this sample of military treatment facilities we found consistent associations between patient's health care experiences, as measured by the H-CAHPS section of TMA's Inpatient Satisfaction Survey, and hospital clinical performance indicators, as measured by the ORYX measures. The H-CAHPS composites—communication with doctors and communication about medications—were most consistently associated with multiple individual ORYX measures. The pattern of associations among the measures suggests that these two quality indicators, H-CAHPS and ORYX, are complementary quality monitoring strategies. These findings may indicate that communication processes are indicators of high quality, team-

based approaches to care that reflect a healthy organization.
Implications for Policy, Practice or Delivery: As this type of analysis is further developed and refined, health care providers and research staff may be able to use these two important data sets for a better understanding of the effect of clinical measures on patient experience and vice versa in individual health care settings.
Funding Source: Center for Health Care Management Studies; Dept. of Defense

▪ Meaningful Comparisons Between Ratings of Adolescent's Health Outcomes by Parents and Adolescents

I-Chan Huang, Ph.D., Elizabeth A. Shenkman, Ph.D., Caprice A. Knapp, Ph.D., Walter Leite, Ph.D.

Presented By: I-Chan Huang, Ph.D., Assistant Professor, Epidemiology and Health Policy Research, University of Florida College of Medicine, PO BOX 100147, Gainesville, FL 32610, Email: ichuang@ufl.edu

Research Objective: Parent proxy ratings are frequently used to measure adolescent's health outcomes (e.g., health-related quality of life (HRQOL)). Previous studies examining dyadic congruence in the ratings typically used correlations/kappa statistics. However, conventional methods are limited because they do not assure measurement invariance (MI). MI requires that 1) parent's ratings have the same measured construct and meanings as the adolescents's, and 2) the comparison of ratings reflect true differences and is not contaminated by factors unrelated to the construct. The purpose of this study was to examine, given the MI, whether there is true discrepancy between parent and adolescent ratings of adolescent HRQOL. We also investigated the correlates of discrepancies in dyadic measures of HRQOL.
Study Design: This is a cross-sectional study. Telephone surveys were conducted with a random sample of 376 parents and their adolescents (15-18 years old) using the PedsQL 4.0. The PedsQL measures physical, emotional, social, and school functioning. We used confirmatory factor analysis to test the MI, specifically configural, metric, and scalar invariance. Configural invariance means HRQOL construct is the same across two groups (i.e., parents and adolescents). Metric invariance means HRQOL measures have the same meaning across two groups (the same factor loadings). Scalar invariance implies comparisons of group means are meaningful (the same factor loadings and item intercepts). MI was tested using fit indexes of the Satorra-Bentler chi-square and Root Mean Square Error of Approximation. We also investigated correlates of discrepancies in dyadic measures of HRQOL, using parent's and adolescent's age, gender, race/ethnicity, parent's education, child's general health status (a Likert-type item), and disease severity (Clinical Risk Grouping system).
Population Studied: Data were collected from parents and adolescents enrolled in Florida's Children's Medical Services Network (CMSN), Florida's Title V program for Children with Special Health Care Needs.
Principle Findings: A total of 364 pairs of parents and children who completed the PedsQL were included in this study. The correlations between dyadic ratings of HRQOL were moderate: 0.56, 0.32, 0.39, and 0.37 for physical, emotional, social, and school functioning, respectively. MI testing revealed configural invariance for all HRQOL dimensions, implying the dyad's measured similar constructs. Metric invariance was also found, implying the HRQOL measures have the same interpretations across the groups. However, scalar invariance was not found for physical, social, and school functioning, implying the comparisons of group means were not meaningful. After adjusting for measurement variance, HRQOL scores (1-poor to 100-excellent) were rated significantly lower by parents than by adolescents for physical (59 vs. 66), emotional (62 vs. 68), social (56 vs. 66), and school functioning (48 vs. 59) ($P<0.05$). The correlates contributing to discrepancies in the dyads were health status and disease severity, especially moderate to severe health conditions ($P<0.05$).
Conclusions: Adolescents rated their HRQOL higher when compared to their parents. The discrepancy was particularly great for those adolescents with more severe health conditions.
Implications for Policy, Practice or Delivery: When designing pediatric policy/practice standards based on ratings of children's outcomes by parents and children, we need to rigorously investigate measurement invariance and take into account differential factors between parent and adolescent.

Measuring Efficiency of Care

Chair: Sarah Hudson Scholle, Dr.P.H., M.P.H.

Monday, June 4 • 2:30 p.m.-4:00 p.m.

▪ Economic Profiling of Physicians: Is the Variation in Costs of Care due to Differences in Utilization or Health Plan Reimbursement Rates

Ateev Mehrotra, M.D., M.P.H., William Thomas, Ph.D., John Adams, Ph.D., J. Scott Ashwood, M.A., Elizabeth McGlynn, Ph.D.

Presented By: Ateev Mehrotra, M.D., M.P.H., Policy Researcher, RAND Health, 4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213, Phone: (412) 683-2300 x4894, Fax: (412) 802-4972, Email: mehrotra@rand.org

Research Objective: In an effort to facilitate value based purchasing and to reduce the rapid rise in health care costs, MedPAC and many large national health plans are pursuing economic profiling of individual physicians. These profiles are created using proprietary software that groups claims into episodes and then determines the costs associated with the episode. The costs of an episode are a function of 1) utilization of services and 2) a health plan's reimbursement rate for those services. In this study we examined how much of the variation across episodes is due to utilization versus differential health plan reimbursement.
Study Design: Cross-sectional study using two years of claims (2003-2004) for continuously enrolled patients from three Massachusetts health plans. Using Symmetry's ETG program, the most popular commercial product used by health plans, we created episodes of care. For an acute problem such as pneumonia, the episode begins with the first claim for this illness and ends when there is a 90-day period during which there are no claims for pneumonia. For chronic illnesses, an episode refers to all the care received for that condition during an entire year. For each episode, we calculated the aggregate costs in two ways: 1) allowed costs for the individual health plan and 2) standardized costs across the health plans. Standardized costs were created by averaging costs across the three health plans for each procedure, prescription, and revenue code. We then determined how much of the variance in costs for episodes was explained by price variation (differential health plan reimbursement) vs. utilization (differential use of services) using a cost accounting budget variance model.
Population Studied: Commercial enrollees of three different Massachusetts health plans
Principle Findings: There were 269,950 continuous enrollees across the two years in the three health plans and 818,588 episodes of care. Decomposition of the cost variation by ETG, procedure, and plan for the 100 highest total cost procedure codes was performed. 32.7% of the variation in costs could be explained by price variation or utilization variation with the remainder attributed to either the interaction of price variation and utilization variation or to less frequent or lower cost procedures that could not be included in the model. Of the explainable variation 83.7% was attributed to utilization variation and 16.3% was attributed to price variation.
Conclusions: These findings describe that approximately 17% of the variation in care across episodes of care is due to differences in health plan reimbursement. Next steps will be to see if controlling for the price variation changes individual physician cost-efficiency profiles.
Implications for Policy, Practice or Delivery: The choice of method for assigning costs to episodes could be important. Standardized costs allow physicians to focus on the intensity of resource utilization, but do not reflect real dollars spent by plans. Actual costs reflect differences in real spending but include a component over which many providers have little control – pricing of services. A robust dialogue about the implications of these choices for public reporting, tiering, and pay-for-performance is in order.
Funding Source: Department of Labor

▪ Challenges for Assessing Hospital Performance: Low Volume and Lack of Consistency

Nikolas Matthes, M.D., Ph.D., M.P.H., M.Sc., Carlos Alzola, M.S., Jacob Jen-Hao Cheng, Ph.D., M.S.

Presented By: Nikolas Matthes, M.D., Ph.D., M.P.H., M.Sc., Assistant Professor (adj), Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, 624 N Broadway, #406, Baltimore, MD 21205, Phone: (410) 540-5052, Fax: (410) 379-9558, Email: nmatthes@jhsph.edu

Research Objective: To devise a methodology to evaluate hospital quality of care over time

across clinical measure sets with special consideration for small hospitals.
Study Design: Retrospective analysis of performance data for National Hospital Quality Measures in three clinical areas for 426 hospitals participating through the Quality Indicator Project over a 2 ½ year period.
Population Studied: We analyzed the quality of care provided by the hospitals in three measure sets: Acute Myocardial Infarction (AMI), Heart Failure (HF) and Pneumonia (PN). Each of these sets was studied over ten consecutive quarters starting with 1st quarter 2004 and ending with 2nd quarter 2006.
Principle Findings: The CMS Composite Quality Indicator (CQI) was used to evaluate hospital performance for each time period and measure set. The CQI however, does not permit the evaluation of trends over time. For this reason Statistical Process Control (SPC) techniques were used to ascertain consistently high performing hospitals over all quarters studied. Many hospitals were able to maintain consistently high performance for the AMI measures; however, there were fewer consistently high performers for HF and PN measures. We used Exponentially Weighted Moving Averages (EWMA) to establish consistency in high performance over time. The advantage of EWMA over other SPC techniques is that it places more emphasis on recent performance. A hospital was deemed to have the care under control if all the smoothed values of CQI over the ten quarters fell above the lower 3? limit. Of 426 hospitals, 374 participated in all measure sets. AMI was had the least variability with 330 hospitals having their process of care under control; HF was next with 277 hospitals; and only finally PN with 192 hospitals. Only ten hospitals were above the 75th percentile of performance in all three measures. This number decreased to 3, 6, and 2 respectively when the 80th, 85th and 90th percentiles were considered.
Conclusions: The techniques of SPC provide a method for evaluating performance over time in a manner that controls for the high variability associated with small populations and variable processes in a healthcare setting. This is of importance since many methods currently used for pay-for-performance do not address this variability, potentially preventing smaller hospitals from receiving financial incentives. Our results also illustrate that very few hospitals, indeed, provide consistently both excellent care and across clinical areas.
Implications for Policy, Practice or Delivery: Pay for performance incentives and public reporting requires the development and testing of robust comparative methodology, since financial rewards are based on comparisons. Incentives could be based not only on high performance but also on consistency over time. This may prove especially important for small hospitals where variability is greatest and low patient volume can lead to the exclusion from the top performing groups.

- **Relationship Between Cost and Quality for People with Diabetes in Managed Care Organizations**

Turbyville Sally, M.A., Sarah Scholle, Dr.Ph., Mark Krushat, Ph.D.

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Research Objective: This research examines the empirical relationship between cost and quality in providing care for adults with diabetes who are enrolled in commercial managed care organizations across the US.
Study Design: Two cross-sectional analyses based on commercial health plan claims/encounter data over a 12-month period (calendar year 2005) were performed. The first analysis focused on results within a PPO delivery structure. The second analysis focused on results within an HMO delivery structure. HMOs were able to supplement the assessment of quality of care rendered with medical record data. Both data sets used for this study are based on summary data derived from health plans' collection and reporting for two HEDIS® measures: 1) Comprehensive Diabetes Care (CDC), and 2) Relative Resource Use (RRU) for People with Diabetes. The first measure reports on plans' performance in achieving important diabetes care process and outcome objectives. The second measure reports an observed-to-expected standardized cost ratio. Costs are computed using a standardized fee schedule for all plans. The ratio estimates plans' standardized costs compared to the risk adjusted average standardized costs among all plans in the studies in rendering care for adults with diabetes. Standardized health care costs across four service category types are captured: 1) inpatient confinements, 2) ambulatory pharmacy use, 3) procedures or surgeries, and 4) office visits.

Population Studied: The first study includes twenty-four commercial HMOs which reported audited HEDIS CDC performance rates in addition to RRU performance results. The second study includes eight PPOs which reported unaudited CDC and RRU HEDIS performance rates. Both studies compared CDC and RRU results for populations of adults who were continuously enrolled for at least 11 months during calendar year 2005 and who were classified as having diabetes. In total, more than 63,000 adults with diabetes are included in these analyses.
Principle Findings: Performance variation in RRU performance is significantly greater than variation in CDC performance. CDC and total RRU are independent (orthogonal) domains of health plan performance. When examining specific service categories, provision of more inpatient services and procedures was statistically significantly negatively associated with CDC. The provision of pharmacy and ambulatory care visits was statistically significantly positively associated with CDC.
Conclusions: High CDC performance rates can be achieved with a relative low RRU. Increased spending for pharmacy and ambulatory care may represent an investment to achieve greater health care value for people with diabetes.
Implications for Policy, Practice or Delivery: How to contain health care costs is one of the most challenging policy issues facing the United States. An increased understanding of which specific health care services may represent a more efficient means of rendering high quality care is a major priority.

- **Micro-Level Mixed-Method Analysis of Quality and Efficiency: Implications for Physician Payments**

Ming Tai-Seale, Ph.D., M.P.H., Thomas McGuire, Ph.D.

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Research Objective: In analyses of physician behavior, how physicians allocate their time plays a central role. The time a physician spends during a visit is put forward as the best example of the "effort" the physician puts into a visit. Effort (time) is costly to the physician and the main input into the quality of a visit. In spite of its central importance, little is known about what determines how much time physicians spend with patients and on topics raised during office visits. While observable by the patient, time is regarded as not contractible. Empirical examination of how physicians spent clinic time is rare. Our objective is to develop a theoretical model of physician time allocation within a visit and to test the model through coded videotaped behavior of physicians and patients. The main assumption to be tested is that physicians allocated time across topics to maximize the value of their services to the set of topics raised during a visit.
Study Design: Direct observation of videotapes of 386 elderly patients' routine office visits that took place between 1998 and 2000 in primary care practices in the Midwest and Southwestern regions of the U.S and surveys of participating patients and physicians inform the study. In documenting how clinical time is used, we break visits into "topics" as a unit of clinical decision making. The longest topic in a visit is designated as a major topics whereas the other as minor topics. Using a mixed-level duration regression model, we analyze the effects of the nature of topics, the dynamics of interaction, and characteristics of patient, physician, and physician's practice setting on how long the topics last and how long patient and physician speak on each topic. We develop and test the implications of a "constant shadow price of time" on time allocation.
Population Studied: Primary care physicians and their elderly patients in three physician practice sites in the U.S.
Principle Findings: The median visit length in our sample lasted 16 minutes and covered 6 topics, all of which competed for time. Patient and physician each spoke, on average, about 2.5 minutes and 2.7 minutes per major topic and 0.7 and 0.6 minutes per minor topic, respectively. Seventy five percent of major topics occurred during the first three topics discussed in the visit. Duration analyses findings suggest that physicians spoke significantly less and patients spoke significantly more on psychosocial and mental health topics. Physicians spoke significantly less on topics introduced later during the visit, even for major topics, and on topics took place during visits with a large number of topics. Visit lengths and topic lengths were the longest among salaried physicians, followed by fee-for-services physicians, then physicians in a managed care group practice.
Conclusions: Physicians are likely to reduce time spent on a topic if it is raised later during the

visit when the subjective opportunity cost of physician time is higher, contradicting the hypothesis of physician caseload benefit maximization. A large number of topics are discussed during a primary care visit, with little time spent on each topic.
Implications for Policy, Practice or Delivery: Efforts to measure the quality of primary care need to recognize how physicians multitask under time pressure. Physician payment mechanisms should address both the contractible and the seemingly non-contractible physician efforts.
Funding Source: NIMH, National Institute on Aging

▪ What is the Relationship Between Quality & Cost-Efficiency among Individual Physicians?
Ateev Mehrotra, M.D., M.P.H., William Thomas, Ph.D., John Adams, Ph.D., J. Scott Ashwood, M.A., Elizabeth McGlynn, Ph.D.

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Research Objective: Most US national health plans are using their claims databases to profile network physicians on their cost-efficiency. Cost – efficiency profiles measure physicians' relative use of resources to care for their populations of patients. Many physicians and policy makers are concerned that encouraging greater cost-efficiency will lead to lower quality of care. The purpose of this study is to describe the relationships between cost-efficiency performance and quality-of-care performance among individual physicians.
Study Design: Cross-sectional study of individual physicians using 2003-2004 claims for continuously enrolled patients from three Massachusetts health plans. We created a cost-efficiency profile in several steps. Using a commercial product, Symmetry's Episode Treatment Groups (ETG), we took each patient's claims and divided them into episodes of care. We then assigned each episode to a physician using an attribution rule and compared the cost of that episode to the episode-type (ETG) average across all physicians. Lastly, we aggregated across all episodes for physicians in the three health plans. To measure quality, we used the RAND claims-based QA tools to evaluate performance on 131 indicators of quality of care for 20 acute and chronic conditions as well as preventive care. Each quality indicator was assigned to a physician using an attribution rule. For each physician we calculated the proportion of recommended care provided. For both the cost-efficiency profile and quality profile we only included in the analyses physicians who had both 10 episodes and 10 quality events. We examined the correlation between the cost-efficiency profile and quality profile for individual physicians.
Population Studied: Commercial enrollees of three different Massachusetts health plans
Principle Findings: There were 269,950 continuous enrollees across the two years in the three health plans, 818,588 episodes of care, and 407,043 quality events. Of the 14,551 physicians (~55% of physicians in state) with either a quality event or episode, 5148 had a sufficient number (>10) of both episodes and quality events. The average quality score among these physicians was 68.0% (STD 14.6%). Primary care physicians had better cost-efficiency scores than specialty physicians (-0.03 vs. -0.01, $p<0.001$). We found essentially no correlation between quality and cost-efficiency ($r=-0.02$, $p=0.09$). This was also true among just primary care physicians ($r=0.02$, $p=0.25$) and specialty physicians ($r=-0.004$, $p=0.85$).
Conclusions: These data support the premise that there is no relationship between measured quality and cost-efficiency performance at the individual physician level.
Implications for Policy, Practice or Delivery: Some have worried that policy interventions such as cost-efficiency profiling and pay-for-performance incentives that encourage less utilization might translate into lower quality care. Our data do not support this concern.
Funding Source: Department of Labor

Evaluating Quality Improvement Interventions

Chair: Cheryl Damberg, Ph.D.

Monday, June 4 • 4:30 p.m.-6:00 p.m.

▪ Effect of a Registry, Tracking & Feedback Intervention to Improve Breast Cancer Care
Nina Bickell, M.D., M.P.H., Kruti Shastri, M.P.H., Kezhen Fei, M.S., Soji Oluwole, M.D., Henry Godrey, M.D., Amber Guth, M.D.

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Research Objective: Despite the existence of effective adjuvant treatment for early-stage breast cancer, women do not always receive it. Primary treatment for breast cancer, surgery and varying combinations of radio-, chemo- and hormonal therapy, is delivered by different specialists and is often fragmented. Underuse of post-surgical adjuvant treatment occurs more commonly among women who do not see a medical oncologist despite surgeons' referral request. To reduce underuse of adjuvant treatment due to failed connections, we tracked and fedback to surgeons information about whether their newly diagnosed breast cancer patients saw the oncologist.
Study Design: Pre and post-test design. We compared oncology vist and underuse rates of radiotherapy following breast conserving surgery, of chemotherapy among women with hormone receptor negative and of hormonal therapy with hormone receptor positive breast cancer tumors >=1 cm. All 38 surgeons at 6 NYC hospitals consented to the intervention. Each surgeon chose an office person to verify eligibility; both office staff and patients identified upcoming oncology appointments. Following scheduled visits, oncologists were called to verify patients' visits and these data were fedback to surgeons and their office staff. Six months later, patients reported oncology visits and treatments received.
Population Studied: Women with a new primary stage I or II breast cancer surgically treated at 6 NYC hospitals during the 1999-2000 pre- (N=677) and the 2004-2006 post- (N=261) intervention periods.
Principle Findings: There were no significant differences between the pre and post-intervention groups in age (60y vs 58y; p=.06), minority race (45% vs 40%; p=0.13) or those on Medicaid or uninsured (25% vs 24%; p=0.79). Patients in the post-intervention group were more likely than pre-intervention group to visit the oncologist (93% vs 81%; p<0.0001). However, there was no difference in rates of adjuvant therapy underuse (21% vs 21%; p=0.91). A logistic model found the intervention (OR=2.9; 95%CI: 1.7-5.0) and patient age <70yrs (OR=0.3; 95%CI: 0.2-0.4) most affected the chance of seeing the medical oncologist (model c=.70;p<.0001).
Conclusions: Registry, tracking and feedback may improve rates of medical oncology consultation but does not appear to reduce rates of adjuvant treatment underuse. This is likely because these episods of underuse are due to causes other than failed connections between surgeons and oncologists.
Implications for Policy, Practice or Delivery: Requiring newly diagnosed breast cancer patients to consult with oncologists is unlikely to reduce underuse of effective adjuvant treatments. Rather, other causes such as communication about treatment risks and benefits, may result in greater improvements in breast cancer care.
Funding Source: AHRQ, Commonwealth, NCMHD

- **Reducing Disparities in Care Using Quality Improvement: Early Results from a Multi-Hospital Collaborative**

Bruce Siegel, M.D., M.P.H., Marcia Wilson, M.B.A., Vickie Sears, R.N., M.S., CCRN, Romana Hasnain-Wynia, Ph.D., Karen Jones, M.S., Jennifer Bretsch, M.S.

Presented By: Bruce Siegel, M.D., M.P.H., Research Professor, Department of Health Policy, The George Washington University School of Public Health and Health Services, 2121 K Street NW, Suite 210, Washington, DC 20037, Phone: (202) 994-8616, Fax: (202) 973-1150, Email: siegelmd@gwu.edu

Research Objective: Disparities in health care represent a failure in the equity domain of quality. The Institute of Medicine's landmark 2003 report Unequal Treatment recommended improved race and ethnicity patient data collection and the use of evidence-based guidelines in efforts to reduce disparities. Yet there is little practical experience with this approach. Our objective was to reduce disparities in cardiovascular care for African Americans and Latinos using these methods in a set of hospitals with large minority patient populations.
Study Design: Through a national competitive process, 10 institutions with large African American and/or Latino populations were selected to work for 29 months to improve cardiac care. The hospitals were trained in a framework for collection of patient race, ethnicity and language data to allow reporting of stratified clinical quality measures. They were also trained on quality improvement techniques to foster use of evidence-based clinical practice. Performance was measured by monthly collection of 23 quality measures by race, ethnicity and language. These measures include the current Hospital Quality

Alliance metrics for heart failure (HF) and acute myocardial infarction (AMI), as well as new "measures of ideal care" assessing whether patients received all evidence-based care for these conditions.
Population Studied: The ten hospitals are diverse institutions, serving rural, suburban, and urban markets and include six not-for-profit, one for-profit, and three publicly owned hospitals. Three are community hospitals, three are teaching hospitals, and four are academic medical centers. Bed size ranges from 325 to more than 1,000. The total number of African American or Latino patients discharged with a primary diagnosis of HF or AMI ranges up to 2,000 per year per hospital.
Principle Findings: Nine of the 10 hospitals have been able to report quality data by race, ethnicity and language. There are observed differences in care between racial and ethnic groups within individual hospitals; some of these disparities narrowed during the initial phase of the collaborative. The median hospital percentage of patients receiving all recommended heart failure care rose from 41% to 78% in the first year of the collaborative.
Conclusions: The uniform collection of race, ethnicity and language data in support of disparities reduction is feasible. The use of evidence based quality improvement practices may be able to narrow racial and ethnic differences at individual hospitals, and can improve quality dramatically at institutions serving large numbers of minority patients.
Implications for Policy, Practice or Delivery: Current national efforts to improve care, including public reporting and pay-for-performance could explicitly include disparities reduction as a goal. Incentives and mandates to improve patient race, ethnicity, and language data collection may be worthwhile given the ability of hospitals to collect this data in a uniform fashion.
Funding Source: RWJF

- **The Effects of a Computer-Tailored Message on Secondary Prevention in Type 2 Diabetes: A Randomized Trial**

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Presented By: Chris Sciamanna, M.D., M.P.H., Director, Division of General Internal Medicine, Penn State Milton S. Hershey Medical Center, Penn State College of Medicine, Division of General Internal Medicine, HU15
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Research Objective: To test the effect of computer-generated tailored feedback on the quality of the chronic disease management care received when given to a patient prior to a scheduled physician visit. Also, to determine whether the type of message received by patients, risk-oriented (negative) or efficacy-oriented (positive), impacts the effectiveness of the message.
Study Design: A stand-alone computer application was developed to provide tailored, printed feedback aimed at empowering patients to more actively engage in their diabetes management at the point of care. First, a survey was created to assess the degree to which certain American Diabetes Association (ADA) guidelines were being met. Second, tailored reminders aimed at empowering participants to more actively engage in their diabetes management at the point of care were developed. Third, feedback messages were provided to participants in either intervention group whose care was not consistent with ADA guidelines covered in the intervention. Lastly, pocket-sized-charts to enter key clinical data and track it over time were provided to participants before a primary care visit. 203 adults with type 2 diabetes were randomly assigned to one of two intervention groups (risk-oriented or efficacy-oriented) or a delayed treatment control group. Each of the two intervention groups were sent computerized reports one week prior to their scheduled primary care visits. Following the visit, a patient exit interview was conducted with all participants.
Population Studied: Men and women who were age 21 years and older receiving routine outpatient care for type 2 diabetes between September 2003 and July 2004. Participants were recruited through an advertisement on www.google.com.
Principle Findings: There were no significant differences in the percentage of participants who received intensified care or routine tests between the control, efficacy-oriented feedback, and risk-oriented feedback groups, even when analyses were limited to those in need of care. For example, there was no significant difference in the number of patients in each group who reported that their physician changed any dose of their diabetes medication (22.0, 31.6, and 25.4

respectively, p=0.50). Satisfaction with care was also unaffected by participant condition.
Conclusions: Participants may benefit from more directive feedback, providing them specific questions to ask their physician that can lead to improved care, rather than educational information about the risks of high blood pressure or benefits of controlling their blood pressure.
Implications for Policy, Practice or Delivery: Given the success of direct-to-consumer interventions and the sharp rise in consumer-directed health plans, effective patient-directed interventions to improve the quality of care are an area of great need.
Funding Source: NCI

- **Measures of Healthcare Associated Infections**

Pat Stone, Ph.D., Teresa Horan, M.P.H., Huai-Che Shih, M.S., Elaine Larson, Ph.D.

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Research Objective: Healthcare associated infections (HAI) are important measures of quality. Sixteen states have legislated hospitals to report HAI and 23 more have legislative activity pending. The purpose of this study is to compare two methods currently implemented by different states: 1) selected infections due to medical care, Patient Safety Indicator (PSI-7), which primarily targets infections related to intravascular lines; and 2) Centers for Disease and Prevention Control (CDC) protocols for identifying central line-associated bloodstream infections (CLA-BSI) in intensive care units (ICUs).
Study Design: This was a cross-sectional, multi-hospital study. To participate, congruent with CDC protocols, the ICU needed to conduct CLA-BSI surveillence. Hospitals provided Medicare numbers of elderly patients cared for in the unit and identified those meeting CLA-BSI definitions. Using Medicare files and PSI software version 2.1, in the same sample, cases that met the PSI-7 definition were also identified. A cross tabulation was made comparing cases identified as acquiring an infection using both methods. Patient characterisitics (age, gender, race, diagnostic related groups, number of discharge diagnoses, number of procedures, severity of illness score, and hospital length of stay) and setting characteristics (hospital beds, hospital teaching status, and type of ICU) of cases identified in both methods were compared. Severity of illness was calculated using the all-encounter, multiple condition model, diagnostic cost group / hierarchical coexisting conditions (DCG/HCC) risk method. Bivariate statistics were computed.
Population Studied: The full sample comprised 14,637 eldery patient records from 41 ICUs in 24 hospitals across the nation. Patients were excluded due to not meeting the PSI-7 denominator criteria.
Principle Findings: In the final sample of 9,948 elderly ICU patients, both methods identified infections in 89 (0.89%) patients. However, there was little concordance with only eight patients identified using both methods. Patients identified with HAI using either method were similar and there were no significant differences in any of the patient or setting characteristics measured (all p values > 0.05). The majority of patients were admitted to medical/surgical ICU in large teaching hospitals. The most common diagnosis was tracheotomy. Patients in both groups on average were 72 (SD=6) years old, had 9 (SD=0.6) diagnoses, 5 (SD=1) procedures, severity score of 5 (SD=4) and 33 (SD=25) day length of stay.
Conclusions: This is the first study to compare two different methods being used by state health departments in response to legislated mandates for hospitals to report HAI. Clearly, in this sample, the different methods identified different cases. Some of this lack of congruence is to be expected. These two mechanisms were not originally designed or developed to measure the same phenomena. However, in practicality both are being used in similar ways to meet legislated mandates for reporting HAI.
Implications for Policy, Practice or Delivery: There is a movement to increase and improve the reporting of HAI using standardized methods. Inconsistencies, such as we identified in this study, are concerning given the fact that reports of HAI generated by different methods vary widely. Mandatory reporting mechanisms should be standardized across the nation and their accuracy confirmed.
Funding Source: AHRQ

- **Functional Outcomes of Home Health Patients in a Randomized Trial of the "Home Health Aide Partnering Collaborative"**

Miriam Ryvicker, M.A., Miriam Ryvicker, M.A., Robert Rosati, Ph.D., Gil Maduro, Ph.D., Theresa Schwartz, B.A., Sally Sobolewski, M.S., R.N.

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Research Objective: Decline in physical function is often a debilitating outcome of hospitalization, a risk factor for falls, and an obstacle to self-care management among home health care patients. Home care services can be pivotal for improving older persons' functional health and ability to continue living at home. Yet, few studies have investigated home care practices intended to improve the functional health of home care patients. This study employed a rigorous evaluation design to examine the impact of a quality improvement initiative – the "Home Health Aide (HHA) Partnering Collaborative" – on the functional outcomes of patients served by the Visiting Nurse Service of New York (VNSNY), a large home health organization. The HHA Partnering Collaborative aimed to better integrate professional and paraprofessional services to improve patient outcomes, aide satisfaction and retention, and patient service use.

Study Design: After a 12-month pilot period, the tools and strategies of the HHA Partnering Collaborative were spread among 21 service delivery teams randomly assigned to the intervention group, while 21 "control" teams engaged in usual practice. We analyzed data from the Outcomes and Assessment Information Set (OASIS) for patients admitted to VNSNY during the 6-month spread period. After conducting a case-mix adjustment, we tested for an intervention effect on the change in score from admission to discharge in the following ADLs: Ambulation, Transferring, and Bathing. The analyses utilized a nested effects method to control for the clustering of patients into teams.

Population Studied: The study included patients receiving HHA services who had a dependency upon admission in at least one of the three ADLs studied. Patients were excluded from the study if they had a life expectancy of less than six months, had severe cognitive impairment, or had the highest levels of dependency in any of the three ADLs of interest.

Principle Findings: The analyses of Transferring and Ambulation showed a statistically significant and positive intervention effect. Bathing showed a positive but insignificant effect. In addition, all three ADL outcomes showed highly significant team effects.

Conclusions: This study advances the current knowledge on quality improvement in functional health by employing a randomized design and using case-mix adjusted outcomes, which is rare for improvement projects. The intervention's significant impact on Transferring and Ambulation indicates that the Collaborative's methods have the potential to move patients toward greater functional independence. Another strength of the study is that by controlling for team clustering we can distinguish between intervention effects and other types of team-level variation. The significant team effects in all of the models suggest that there may be as yet-unmeasured sources of organizational variation that influence patient outcomes and that may warrant further examination.

Implications for Policy, Practice or Delivery: The positive impact of the intervention on patient functional outcomes holds promise for future such interventions that adopt and adapt Learning Collaborative methods to improve teamwork among nurses, aides and patients to promote effective goal setting and patient well being. Addressing functional health through future quality improvement efforts is critical to reducing the damaging effects of hospitalization and promoting self-management of chronic illness among older adults.

Funding Source: Assistant Secretary for Planning and Evaluation

Hospital Quality

Chair: Rachel Werner, M.D., Ph.D.

Tuesday, June 5 • 1:00 p.m.-2:30 p.m.

▪ Association of Quality of Care, Hospital Setting and Physician Training among Children in the Emergency Department

Patrick Romano, M.D., M.P.H., James P. Marcin, M.D., M.P.H., Nathan Kuppermann, M.D., M.P.H., Emily R. Andrada, M.D., Danielle J. Harvey, Ph.D.,

Presented By: Patrick Romano, M.D., M.P.H., Professor of Medicine and Pediatrics, University of California Davis, 4150 V Street, PSSB Suite 2400, Sacramento, CA 95817, Phone: (916)734-7237, Email: psromano@ucdavis.edu

Research Objective: To measure the quality of care delivered to children in Emergency Departments (EDs) and to investigate

differences in quality across different ED settings and across different physician specialties.
Study Design: This was a retrospective cohort study at four rural non-children's hospitals (RNCH) and one academic urban children's hospital (UCH). Two pediatric emergency medicine trained physicians independently rated quality of care by applying a previously validated implicit review instrument to photocopied medical records masked to hospital and physician identification. We used hierarchical modeling to estimate the relationship between overall quality of care (scored 5-35) and both hospital setting (RNCH versus UCH) and physician training, including Pediatric Emergency Medicine (PEM), General Emergency Medicine (GEM), Family Medicine (FM), and Other physicians.
Population Studied: We included children presenting between January 2000 and June 2003 to the RNCH EDs who were triaged in the highest category at presentation (i.e., those children considered seriously ill or injured) and a random sample of children presenting to the UCH ED, similarly triaged in the highest category. This study included children older than one day and younger than 17 years of age.
Principle Findings: We measured quality of care in 166 and 138 patients presenting to the RNCHs and the UCH, respectively. With risk adjustment, on average, higher quality of care was provided to older children (0.6 points higher for every 5-year increase in patient age, 95% CI: 0.20, 0.96). Quality of care was 3.2 points lower (95% CI: -4.45, -1.94), on average, when patients were treated at the RNCH compared to the UCH. Overall, compared to PEM and GEM trained physicians, FM and Other trained physicians provided lower quality of care, on average, by 3.3 (95% CI: -5.44, -1.08) and 3.1 points (95% CI: -5.32, -0.84), respectively. Finally, we found that quality of care provided by GEM trained physicians treating patients at the RNCHs, on average, was 2.8 points lower (95% CI: -5.43, -0.06) than the quality of care provided by PEM and GEM trained physicians treating patients at the UCH.
Conclusions: The quality of care provided to children in EDs presenting in the highest triage category is associated with the age of the child, the ED setting and the training of the physician providing the care.
Implications for Policy, Practice or Delivery: Differences in quality of care associated with ED setting and physician training reinforce the importance of addressing disparities in the quality of care provided to children in the ED. Improving the quality of care provided to children in rural EDs may require improvements in pediatric resources, operational structures, and/or staffing.
Funding Source: AHRQ, HRSA, California Health Foundation

- **Is Compliance With National Hospital Quality Measures Associated With Improved Patient Outcomes?**

Helen Neikirk, M.A., Ming Zhang, M.S.

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Research Objective: To explore the relationship between compliance with the CMS/JCAHO National Hospital Quality Measures (NHQM) and specific patient outcomes.
Study Design: The University HealthSystem Consortium (UHC) serves as the vendor for data collection and submission to both CMS and JCAHO of the Hospital Quality Measures ("core measures") for more than 90 academic medical centers and teaching hospitals. All of these hospitals also participate in UHC's Clinical Data Base (CDB) which contains patient identifiers allowing identification of readmissions over time. By combining patient-level NHQM and CDB data we were able to study the relationship between compliance with NHQM process measures and two specific patient outcomes, in-hospital mortality and related readmissions. A binary patient-level composite measure representing compliance with all individual measures for which the patient qualified was constructed. Chi-square statistics were computed to determine the association between the composite measure and in-hospital mortality for AMI, heart failure, and pneumonia. For AMI and heart failure, Chi-square statistics were also calculated for the relationship between the composite measure and related readmissions within 30, 60 and 90 days. For pneumonia and surgical infection prevention (SIP), examination of time to related readmission was limited to 7, 14, and 30 days. In addition to the composite measures, the relationship between compliance with individual measures and outcomes was examined. For AMI and pneumonia, compliance with admission measures (e.g., aspirin/beta blocker at arrival, antibiotic within 4 hours of arrival) and in-hospital mortality was examined.

For AMI, heart failure, and pneumonia the relationship between individual discharge measures (e.g., aspirin/beta blocker/ACEI/ARB at discharge, smoking cessation counseling, discharge instructions, pneumococcal/influenza vaccination)and related readmissions was examined. For SIP, the relationship between each of the individual measures (antibiotic within 1 hour of incision, antibiotic selection, antibiotic discontinued within 24 hours of wound closure) and readmissions was examined.

Population Studied: Inpatients aged 18 and older representing 89 hospitals who were included in NHQM data collection from 1/1/2005 through 6/30/2006.

Principle Findings: Associations between compliance with NHQM and in-hospital mortality were weak. Somewhat stronger associations were found for compliance and related readmissions, especially for ACEI/ARB in AMI and heart failure and discharge instructions in heart failure.

Conclusions: Some evidence-based process measures were found to be associated to a limited extent with the patient outcomes of in-hospital mortality and related readmission. Further research is needed to identify and quantify the relationships between processes of care and outcomes.

Implications for Policy, Practice or Delivery: Much time and effort is being spent by hospitals with limited resources in collecting, analyzing, and reporting data on compliance with evidence-based process measures. This study was an attempt to quantify the extent to which these measures actually affect specific patient outcomes. Studies like this are needed to help policy makers prioritize the specific measures which will provide the greatest return on this investment in resource-intensive data collection efforts.

- Relationship of Safety Culture and Safety Performance in Hospitals

Laurence Baker, Ph.D., Sara J. Singer, M.B.A., David Gaba, M.D., Alyson Falwell, M.P.H., Shoutzu Lin, M.S., Tobias Rathgeb, B.A.

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Research Objective: The presence of a hospital culture that emphasizes patient safety is increasingly recognized as a key to improving patient safety. While it is widely assumed that stronger safety culture in hospitals will be associated with better outcomes, there is little quantitative evidence available about whether there is in fact such a relationship. This project examines the association between measures of hospital safety culture and hospital performance on indicators of patient safety.

Study Design: We performed a hospital-level cross-sectional analysis of the relationship between safety culture and patient safety measures. Safety culture measures were derived from the Patient Safety Climate in Healthcare Organizations (PSCHO) survey, administered in 2004 to senior administrators, physicians, and staff in a sample of hospitals from across the country (response rate=51%). Results from the survey were used to construct an overall measure of the strength of safety culture at each hospital, measures for several subscales of safety culture, and measures of safety culture perceptions for specific groups within hospitals (e.g. senior managers, nurses). Safety performance measures come from the AHRQ Patient Safety Indicators (PSIs) implemented using 2000 HCUP data. We use regression analysis to relate the safety culture and PSI scores, controlling for a range of other hospital characteristics.

Population Studied: The PSCHO instrument was administered in 92 hospitals nationwide. We obtained HCUP-based PSI data are for 18 states. Both PSI and PSCHO data are available for 47 hospitals. Study hospitals are representative of all U.S. hospitals with respect to hospital-level PSIs.

Principle Findings: Some dimensions of safety culture perceptions are associated with PSIs. Measures of safety culture that capture individual beliefs (e.g. fear of blame and shame) show strong, statistically significant, relationships. Measures of less proximate aspects, such as characteristics of the work unit and hospital overall, were not related. Perceptions among front line personnel but not senior managers were related to PSIs,. Nurses' perceptions about safety culture were related to PSI measures expected to be sensitive to nursing care.

Conclusions: This is the first study to empirically examine the link between safety culture and safety performance in a sample of moderate size. The results suggest that there are quantitatively important relationships, and that the strength of the relationship can vary

from one group of personnel to another, and from one aspect of safety culture to another.
Implications for Policy, Practice or Delivery: The association between PSIs and individual-oriented aspects of safety culture suggests attention to interventions that can address the sometimes deeply-ingrained beliefs about safety held by of individuals working in hospitals. Lack of association between senior managers' perceptions and PSIs suggests the possibility that executives may not fully appreciate the safety hazards at the front lines, and that interventions designed to help them more accurately perceive risks "at the sharp end" could be valuable. Differences in perceptions between nurses and doctors may signal important general communication and coordination difficulties, which should be further explored and addressed. Further work to examine relationships with larger samples and longitudinal designs would be valuable.
Funding Source: AHRQ

- Relationship Between Quality of Care & Patient Outcomes for Hospitalized Elders

Vineet Arora, M.D., M.A., Stuart Chen, Juned Siddique, Dr.P.H., Greg Sachs, M.D., David Meltzer, M.D., Ph.D.

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Research Objective: Ideal quality measures are associated with meaningful outcomes. However, asessing the impact of quality measures on relevant patient outcomes can be particularly challenging for hospitalized older patients, with multiple comorbidities. This study aims to assess the relationship between quality of care for hospitalized elders, as measured by ACOVE (Assessing Care of Vulnerable Elder) Quality Indicators (QIs), and functional decline, a relevant outcome for these patients.
Study Design: During an inpatient interview, patients age 65 and older at a single hospital were identified as "vulnerable" using the Vulnerable Elder Survey (VES-13), which is based on age, self-reported health, and physical function. Patients also reported their function using the Activities of Daily Living (ADLs) for 2 time periods: a) time of admission (present); and (b) one month prior to admission (retrospective). During a one- month post-discharge telephone survey, patients reported ADL´s during (c) time of discharge (retrospectively); and (d) one- month after discharge (present). Functional decline, a binary outcome defined as an increase in ADL impairments, was calculated for the 4 time periods from above: (1) a to c; 2) b to d; 3) a to d; and 4) b to c. Adherence to 16 hospital care QIs was obtained by chart audit. Multivariate logistic regression, adjusting for the fact that frail patients are more likely to decline (VES-13 score), interaction between VES-13 score and QI adherence, and the number of baseline ADL limitations, was used to assess the effect of adherence to ACOVE QIs on functional decline in each time period.
Population Studied: Patients 65 or older at a single academic hospital
Principle Findings: 793/1652 (48%) older inpatients from May 2004 to April 2005 were considered "vulnerable." For 580 (73%) patients, we have completed chart audits. Of these, 499 (86%) patients completed the inpatient interview and 441 (61%) the follow-up survey. A complete ADL assessment was available for 407 of these patients. 212/407 (52%) patients suffered functional decline in any time period. In multivariate logistic regression, adherence to three of the sixteen quality indicators were associated with a higher likelihood of functional decline in at least one time period. Patients who received exercise programs (OR=1.87, 95% CI 1.02-3.43, p=0.04), early discharge planning (OR=1.58, 95% CI 1.05-2.37, p=0.03), and a formal physician assessment (at least 2 ADLs or IADLs) of functional status (OR=1.89, 95% CI 1.05-3.37, p=0.03), were more likely to experience functional decline.
Conclusions: Higher quality of hospital care, as measured by certain ACOVE QIs, is associated with functional decline.
Implications for Policy, Practice or Delivery: This finding is in contrast with an earlier study which demonstrates that higher quality of care, as measured by ACOVE QIs, is associated with improved survival in community-dwelling elders. This suggests that indicated care processes are being selectively applied to those hospitalized older patients most at risk of functional decline. To account for this, future efforts to link quality of care to outcomes for these patients will likely require random assignment.
Funding Source: Hartford Foundation, Donald W. Reynolds Foundation

- The Impact of the ACGME Duty Hour Rules on Mortality Rates in Teaching Hospitals

Kevin Volpp, M.D., Ph.D., Amy K Rosen, Ph.D., Paul Rosenbaum, Ph.D., Patrick Romano, M.D., Orit Evan-Shoshan, M.S., Jeffrey H. Silber, M.D., Ph.D.

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Research Objective: In response to concern about deaths in American hospitals from medical errors, the Accreditation Council for Graduate Medical Education - ACGME - released rules effective July 1, 2003 that restricted duty hours for all ACGME-accredited residency programs. The objective of this study was to determine the impact of the duty hour regulations, one of the largest interventions ever undertaken to improve patient safety in teaching hospitals nationwide, on mortality in VA hospitals. VA hospitals are the largest single training site for physicians in training in the United States.
Study Design: Observational study using interrupted time series analysis with data from July 1, 2000 - June 30, 2005. Logistic regression was used to examine the change in mortality for patients in more versus less teaching-intensive hospitals before and after duty hour reform, adjusting for patient comorbidities, common time trends, and hospital site. Data were obtained from the VA Patient Treatment File, the VA Beneficiary Identification and Record Locator Subsystem file, and the VA Office of Academic Affiliations.
Population Studied: All unique patients - n = 339,020 - admitted to acute-care VA hospitals from July 1, 2000 to June 30, 2005 with a principal diagnosis of acute myocardial infarction - AMI, congestive heart failure, gastrointestinal bleeding, or stroke or a DRG classification of general, orthopedic or vascular surgery.
Principle Findings: In post-reform year 1, there were no significant relative changes in mortality for either medical or surgical patients. In post-reform year 2, the odds of mortality declined significantly in more teaching-intensive hospitals for medical patients only. Comparing a hospital with a resident to bed ratio of 1.0 to one with a resident to bed ratio of 0, the odds of mortality were significantly reduced for AMI patients - OR 0.49, p-value less than 0.0001, 95% CI 0.33,0.71; for the 4 medical conditions together - OR 0.74, p-value less than 0.002, 95% CI 0.61,0.89; and for the 3 medical conditions besides AMI - OR 0.79, p-value=0.03, 95% CI 0.63, 0.98. Compared to the average patient in a hospital in the 25th percentile of teaching intensity, mortality improved from pre-reform year 1 to post-reform year 2 by 0.70 percentage points for patients in hospitals in the 75th percentile of teaching intensity and by 0.88 percentage points in hospitals at the 90th percentile of teaching intensity, a relative improvement of 11-14%.
Conclusions: The ACGME duty hour regulations were associated with large-scale improvement in mortality rates for patients with 4 common medical conditions but not among surgical patients in more vs. less teaching intensive VA hospitals in post-reform year 2. Further consideration is needed of the benefits and costs to different approaches to reducing medical errors in teaching hospitals among physicians in training given the magnitude of the benefits observed in this study.
Implications for Policy, Practice or Delivery: We found no indication that the new duty hour standard harmed patients in any way; indeed, for some medical conditions, there were clear indications of reduced mortality, which suggests that limiting duty hours may help improve patient safety. A single duty hour standard may affect trainees in different specialties differently, and experimentation is needed to test the relative cost effectiveness of different approaches.
Funding Source: VA, NHLBI

Quality: Reporting & Rewarding Performance

Quality Reporting: Benefits & Challenges

Chair: Kevin Volpp, M.D., Ph.D.

Monday, June 4 • 2:30 p.m.-4:00 p.m.

- **A Stratified Cluster Randomized Trial of a Web-Based Decision-Making Tool to Promote Informed Decision-Making among Small Business Employees in California**

Patrick Romano, M.D., M.P.H., Julie Rainwater, Ph.D., Jorge Garcia, M.D., Michael Hogarth, M.D., Daniel Tancred, Ph.D., Debora Paterniti, Ph.D.

Presented By: Patrick Romano, M.D., M.P.H., Professor of Medicine and Pediatrics, Divison of General Medicine, University of California, Davis, 4150 V Street; PSSB Suite 2400, Sacramento, CA 95817, Phone: (916) 734-7237, Fax: (916) 734-2732, Email: psromano@ucdavis.edu

Research Objective: We used an interactive, web-based decision-making tool to provide small business employees with comparative information about health plan and medical group quality of care during open enrollment (OE) in 2005. Employees could generate customized quality reports (and health plan rankings) based on their specific health needs, thereby increasing the salience of the information and removing perceived barriers to its use. The main purpose of this analysis was to study whether access to this tool affects switching behavior across health plans among small business employees.
Study Design: Stratified cluster randomized field trial. Employee-level and employer-level factors associated with switching to a new health plan were identified using cluster and stratum-adjusted bivariate analyses and generalized estimating equations. Given low overall use of the decision-making tool in the treatment group, propensity score stratification was used to estimate the effect of the treatment among employees who were likely to use it.
Population Studied: Small business employees in California who received their health coverage through Pacific Health Advantage (PacAdvantage), a new-defunct small business purchasing pool, were the target population. The sample consisted of 9173 employees who were nested within 651 health insurance brokers. Brokers were stratified into five groups based on their distribution of employer size. Within each stratum, employers whose OE fell during a 3-month study period with at least two choices of HMO plans were randomly assigned to either a treatment group or a control group.
Principle Findings: Of the 9173 randomized employees, 3167 (34%) withdrew from PacAdvantage due to market-related factors. There were no systematic differences between treatment groups in the remaining sample. A total of 192 (6.6%) employees in the treatment arm switched to a new health plan, compared with 165 (5.3%) in the control arm (p=0.19). We found no significant difference in the direction of switching (to higher versus lower quality plans). In multivariate analysis, actual use of the website (e.g., treatment received) was significantly associated with switching (Odds Ratio [OR] 2.86; 95% CI 1.48-5.53, p=0.002). Age (OR 0.99; 95% CI 0.97-0.99, p=0.03) and Kaiser membership (OR 0.10; 95% CI 0.03-0.35, p=0.0003) were also independently associated with switching. There was no difference in the effect of treatment group on switching across strata based on propensity to visit the website.
Conclusions: We did not find any statistically significant effect of access to a web-based quality-of-care tool on health plan switching among small business employees, even among employees with the highest propensity to use the tool. We lost power due to the high dropout rate during open enrollment, but the study was still powered to find a 2% between-group absolute difference in switching.
Implications for Policy, Practice or Delivery: Although access to the web-based quality information did not significantly affect switching behavior, it might have secondary effects on plan choosers such as increasing self-efficacy or improving awareness of quality issues. It is important to acknowledge small business employees' diversity in education, computer access, and job turnover. Cost is a fundamental factor driving plan selection in this setting. Further studies are needed to learn the best ways of using quality information to drive performance improvement.
Funding Source: AHRQ

- **Laboratory Specimen Identification Error Detection: Use of Direct Observation Reveals Large Numbers of Near Miss Events**

Dana Grzybicki, Ph.D., M.D., Stephen Bruno, B.S., Dick Zarbo, M.D., D.M.D., Chris Jensen, M.D., Kim Geisinger, M.D., Stephen S. Raab, M.D.

Presented By: Dana Grzybicki, Ph.D., M.D., Assistant Professor, Biomedical Informatics and Pathology, University of Pittsburgh School of Medicine, UPMC Cancer Pavilion Suite 201, 5150 Centre Avenue, Pittsburgh, PA 15232, Phone: (412) 623-7862, Fax: (412) 623-4014, Email: grzybickidm@upmc.edu

Research Objective: To compare pathology laboratory specimen identification error proportions using two detection methods: self report and direct observation.
Study Design: Retrospective review of anatomic pathology laboratory quality assurance records containing self reported numbers of specimen identification errors and direct observation by a non-participant observer of laboratory specimen receipt and accessioning activities.

Population Studied: All anatomic pathology laboratory specimens received for processing and examination at four large hospital-based laboratories. A 12 month retrospective review was performed for self reported error data. Direct observation was performed during the day shift at each laboratory for five consecutive days.
Principle Findings: Self report quality assurance data from all four laboratories revealed identification error proportions of 1-3%, which are consistent with previously published reports. Direct observation data revealed significantly higher error proportions for all laboratories (62-90%). The most common identification errors involved lack of information regarding patient clinical history, time of specimen procurement, location of patient, and patient provider name. Over 90% of errors detected by direct observation were classified as near miss events.
Conclusions: Self reported specimen identification error frequencies, which are the frequencies currently reported for quality assurance/improvement purposes, represent a small fraction of identification errors that are identified using direct observation.
Implications for Policy, Practice or Delivery: 2007 laboratory services national patient safety goals include improving the accuracy of patient identification. Current, widely used self report detection methods significantly underestimate the numbers and kinds of identification errors occurring in anatomic pathology laboratories related to patient specimens. Accurate assessment of apecimen identification errors for quality and patient safety improvement purposes will require modifications in current error detection and reporting methods.
Funding Source: AHRQ, CDC

- **Improving the Antimicrobial Prophylaxis Process: Does a Group Collaborative Increase the Effectiveness of Comparative Feedback?**

Barbara I. Braun, Ph.D., Stephen B. Kritchevsky, Ph.D., Andrew J. Bush, Ph.D., Bryan P. Simmons, M.D., Michele R. Bozikis, M.P.H., Linda L. Kusek, R.N., M.P.H.

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Research Objective: Hospitals routinely receive comparative feedback without guidance on how to improve specific processes. Group collaboratives are a widely used performance improvement method designed to stimulate rapid change. We undertook a study to determine whether hospitals randomly assigned to receive comparative feedback and participate in a group collaborative show greater improvement on five indicators of the surgical antimicrobial prophylaxis (AMP) process than the hospitals receiving comparative feedback alone.
Study Design: The Trial to Reduce Antimicrobial Prophylaxis Errors (TRAPE) study was a four year group randomized trial, part of an ongoing collaboration between the Society for Health Care Epidemiology (SHEA), the Centers for Disease Control and the Joint Commission. Following the baseline and re-measurement data collection periods, each hospital received a customized report showing its relative performance on the indicators in rank order. After baseline, 22 hospitals were randomly assigned to participate in the collaborative intervention. The collaborative consisted of two in-person meetings with clinical leaders and improvement experts, monthly phone calls to share obstacles and successes and the promotion of specific process changes.
Population Studied: Forty-four US general medical-surgical hospitals collected detailed information on the prophylaxis process from 100 randomly selected surgical cases (hysterectomy, joint replacement, cardiac procedures) over two time periods: baseline (6/03-11/03) and re-measurement (2/05-10/05). These data were used to calculate performance indicators consistent with published recommendations (Clinical Infectious Disease 2004; 38:1706-15). All hospitals documented their specific improvement activities in an open text study log, which was coded for analysis.
Principle Findings: All 44 hospitals provided complete data for both time periods. The change in indicator performance over time was evaluated by generalized estimating equations. Comparing the report only group with the report plus collaborative group, the proportion of patients who received a properly timed dose of AMP rose from 74.8% to 85.3% ($p < 0.05$) and 76.3% to 83.2% ($p < 0.05$) respectively (p for difference = 0.4). The proportion who received prophylaxis for no more than 24 hours post surgery rose from 54.8% to 66.8% ($p < 0.05$) and 51.4% to 69.6% ($P < 0.05$) respectively (p-diff = 0.25). The proportion who received the recommended drug went from 93.4% to 95.4% and 93.7% to 94.7% respectively (p-diff = 0.46). There were no significant differences between

groups after stratifying by hospital size or baseline performance. The mean total number of improvement strategies implemented in the report only and report plus collaborative groups were 10.2 (sd=7.5) and 8.5 (sd= 4.9) respectively (ns).
Conclusions: Both groups significantly improved in almost all indicators; the difference in the degree of improvement between those receiving the collaborative or not was not significant. The national Surgical Infection Prevention (SIP) project likely contributed to improvement in both groups. Participants reported that the effectiveness of improvement strategies was influenced by motivational factors and comparative feedback on performance.
Implications for Policy, Practice or Delivery: These findings add to the growing body of research evaluating the effectiveness of the group collaborative as an improvement strategy.
Funding Source: AHRQ

- **Has the Hospital Quality Initiative Measure on Antibiotic Timing in Pneumonia Produced Unintended Consequences?**

Mark Friedberg, M.D., M.P.P., Ateev Mehrotra, M.D., M.P.H., Jeffrey Linder, M.D., M.P.H.

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Research Objective: In 2004, the Centers for Medicare and Medicaid Services' Hospital Quality Initiative (HQI) began publicly reporting hospital performance on 10 quality measures, including the rate of antibiotic administration within 4 hours of hospital arrival for patients with pneumonia. Concern has been raised that this measure may have unintended consequences for pneumonia diagnostic accuracy, antibiotic use, and resource allocation. We sought to determine whether the introduction of this measure has been associated with increased rates of pneumonia diagnosis, increased provision of antibiotics intended to treat pneumonia, and–as a measure of potential resource diversion–decreased waiting times for patients presenting to hospital emergency departments (EDs) with respiratory complaints, relative to other patients seeking emergency care.
Study Design: We used the National Hospital Ambulatory Medical Care Survey (NHAMCS) to identify a nationally representative cohort of 15,065 ED visits by adult patients with respiratory complaints from 2001 to 2004. In bivariate analyses, we compared pre-HQI (2001-2003) and post-HQI (2004) rates of pneumonia diagnosis, rates of administration of antibiotics recommended for hospital treatment of pneumonia, and waiting times to see a physician for patients with respiratory complaints. We then constructed multivariable models predicting each of the outcome variables as functions of the pre- and post-HQI time periods as well as patient, hospital, and clinical factors. In models of waiting times, we further controlled for trends in this variable among patients without respiratory symptoms.
Population Studied: Adult patients presenting to hospital emergency departments.
Principle Findings: There were 45 million (95% confidence interval [CI], 41 million to 48 million) visits by adults with respiratory complaints to hospital EDs in the United States from 2001 to 2004. Among ED visits for respiratory complaints, rates of pneumonia diagnosis were 9.7% pre-HQI and 10.6% post-HQI (OR, 1.10; 95% CI, 0.95-1.27), rates of administration of antibiotics recommended for pneumonia were 9.4% pre-HQI and 11.1% post-HQI (OR, 1.21; 95% CI, 1.02-1.42), and waiting times to be seen by a physician were 40.4 minutes pre-HQI and 46.3 minutes post-HQI (difference, 5.9 minutes; 95% CI, 0.7-11.2). In multivariable modeling, there were no significant differences between pre- and post-HQI rates of pneumonia diagnosis (OR, 1.15; 95% CI, 0.86-1.53), administration of recommended antibiotics (OR 0.89, 95% CI, 0.64-1.23), or waiting times to see a physician (difference 8.1 minutes, 95% CI, -2.5–18.7). Patients with respiratory complaints had mean adjusted waiting times that were 6.2 minutes (95% CI 3.5-8.9) shorter than patients without respiratory complaints pre-HQI, and this difference showed a nonsignificant decrease of 3.9 minutes (95% CI, -0.1–7.9) post-HQI.
Conclusions: Judging by national trends in pneumonia diagnosis rates, administration of antibiotics recommended for pneumonia, and waiting times to see a physician, early empirical evidence does not substantiate concerns that the HQI pneumonia measure on antibiotic timing has created unintended potentially adverse consequences for patient care. However, our study is limited by short post-HQI duration of observation (2004 only) and a data source that does not allow for hospital-level analysis.
Implications for Policy, Practice or Delivery: Ongoing monitoring of clinical parameters

potentially impacted by quality incentives will help determine their intended and unintended effects.
Funding Source: NRSA

▪ **When Better Quality Care Increases the Treatment Specific Risk of Mortality: A Newly Described Bias in Performance Reporting**
Lawrence Kleinman, M.D., M.P.H.

Presented By: Lawrence Kleinman, M.D., M.P.H., Vice Chair for Research and Education, Health Policy, Mount Sinai School of Medicine, 1 Gustav Levy Place, New York, NY 10029, Phone: (212) 659-9556,
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Research Objective: Although timeliness has been proposed as one of six core attributes of quality, little attention has been paid to the failure to consider timeliness when reporting either operations or research data. This study demonstrates the bias that results from the association between classification variables and time to treatment. This article uses data that underlay a public hospital report card to demonstrate the misleading association of better, timelier care with increased treatment-specific mortality, using the example of acute myocardial infarction (AMI) and percutaneous transluminal angioplasty (PTCA).
Study Design: Conceptual model demonstrated using decision analysis. Decision model calculated mortality risk by treatment class (PTCA vs no PTCA) for each day following admission. Decision models permit a thought experiment to demonstrate implications for interpreting research data.
Population Studied: All acute hospital discharges with primary or secondary diagnosis of acute myocardial infarction in Pennsylvania in 2000 (N=31,351). Decision model used only those patients with APR Risk of Mortality Score = 3 (4 is high, N=11,488).
Principle Findings: Timelier treatment with PTCA saves lives but increases the measured mortality among those receiving PTCA. For example, increasing the proportion of PTCA performed on the first day from 20% to 70% would increase PTCA-specific mortality from 1.5 % to 2.3 %, and decrease overall mortality from 9.5 % to 9.3 %. This inverse relationship between overall and PTCA-specific mortality is 'outcomes migration bias.' It will occur whenever sicker patients die sooner; effective intervention exists and is utilized, earlier intervention is desirable; and timing of intervention varies. Decision models further demonstrate the potential that delayed enrollment in research studies (such as the delay to enroll Spanish speaking patients because of a wait for an interpreter) may either conceal real associations (e.g., when delay leads to uncounted deaths prior to offering enrollment), or reveal spurious ones (e.g. when delay harms prognosis but does not cause death before enrollment).
Conclusions: Although the timing data are blunt (day of procedure), they are sufficient to demonstrate the existence of outcomes migration bias, which cannot be corrected using risk adjustment. Treatment- or class-specific mortality rates may be misleading. Whether reporting operational or experimental data, the timing of treatment should be accounted for.
Implications for Policy, Practice or Delivery: Health care outcomes are often reported stratified by treatment variables, or by any number of classification variables, such as age, race, gender, or insurance type. The independent associations of any classification variable with time to treatment and outcomes may lead to confounding and thus to misleading results. Such results might hide true associations or cause non-existent ones to appear. Because time to treatment is not a typical part of many report cards, the potential exists to steer informed patients away from the best care and towards a premature demise. Since these findings suggest a potential incentive for withholding care from patients at the highest risk for mortality, quality of care should not be reported to the public primarily through the use of stratum-specific outcomes rates. Outcomes reports should include condition-specific outcomes. Time from presentation (not enrollment) to treatment may also be important when presenting research data.

Pay for Performance & Outcomes

Chair: Dennis Scanlon, Ph.D., M.A.

Tuesday, June 5 • 9:00 a.m.-10:30 a.m.

▪ **Rewarding Performance: Three-Year Results from California's Statewide Pay-for-Performance Experiment**
Cheryl L. Damberg, Ph.D., Kristiana Raube, Ph.D., Claude Setdoji-Messan, Ph.D.

Presented By: Cheryl L. Damberg, Ph.D., Senior Policy Researcher, Health Program, RAND Corporation, 1776 Main Street, Santa Monica, CA

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Research Objective: To examine: 1) Changes in performance on a set of measures (clinical, patient experience, and Information Technology (IT)) between 2003 and 2006 among the universe of Physician Organizations (POs) exposed to a statewide pay-for-performance program in California; 2) The structural characteristics associated with differential performance; 3) The distribution of payouts to POs by size, type of group, and region, and changes in winners and losers over the 3-year period.
Study Design: 225 POs in California that contract with 7 largest health plans were exposed to financial and non-financial incentives (i.e., public reporting of performance scores). POs were scored on 9 clinical measures, 4 patient experience domains, and 2 IT domains (integrating clinical electronic data at group level for population management and supporting clinical decision-making at the point of care through electronic tools). The study uses clinical performance data (aggregated from 7 health plan administrative sources and self-reported, audited PO encounter data sources), patient survey data from an annual clinician-group CAHPS survey conducted in California, and PO self-reported information on IT capability. Data are reported for 2003, 2004, and 2005 (used to make payouts in 2004, 2005, and 2006). Year-to-year changes in performance scores and the spread in scores are computed; we examine relative rates of improvement by quartiles of performance. Using a multivariate regression model, we also examine structural characteristics of the PO (e.g., size, region, IPA/medical group, # of physicians, # of practice sites), controlling for demographic char that are associated with differential performance.
Population Studied: 225 Physician organizations (medical groups and IPAs) in California; HMO and POS capitated enrollees of the 7 health plans (7 million enrollees).
Principle Findings: Improvements were observed in clinical measures (e.g., 56.3% of POs saw an average 1.1% point improvement in mammography screening; 77.4% saw an average 5.4% point improvement in cervical cancer screening, and 60.2% of groups saw an average 3.5% point improvement in HbA1c screening). The spread in performance scores between the top 90th percentile and the lowest 10th percentile performance decreased: (0.2% points), breast cancer (1.3% points), cervical cancer screening (10.8% points),childhood immunizations (9.7% points for VZV and 9.4% points for MMR), diabetic screening (13.2% points). On average, POs in 2006 received more in 2005 or 2004. As a percentage of capitation payments, average incentive payments increased from 1.0% of capitation 2004 to 2.3% in 2006
Conclusions: Performance improvement was observed between 2004 and 2006, both as a function of improved data capture and real performance improvement. The largest relative year-to-year changes in performance scores were observed among the lowest performers and these were the same POs who received little or none of the bonus money based on the incentive structure rewarding relative performance
Implications for Policy, Practice or Delivery: Variation has narrowed, although performance remains sub par in the areas of access, coordination, and for some clinical areas. As performance score variation compresses, payouts based on relative performance are perceived as unfair due to lack of statistically different performance scores between groups.
Funding Source: California Healthcare Foundation

- **Actions Taken by Nursing Homes in Response to Publication of the Nursing Home Compare Report Card**

Dana Mukamel, Ph.D., David Weimer, Ph.D., Heather Ladd, M.S., William Spector, Ph.D., Jaqueline Zinn, Ph.D.

Presented By: Dana Mukamel, Ph.D., Professor, Center for Health Policy Research, University of California, Irvine, 111 Academy, Suite 220, Irvine, CA 92697, Phone: (949) 824-8873, Fax: (949) 824-3388, Email: dmukamel@uci.edu

Research Objective: There is limited, and sometimes controversial, empirical evidence on the success of quality report cards in improving quality of care. The objective of this study was to examine this question in the context of the Nursing Home Compare quality report card published nationally by the Centers for Medicare & Medicaid Services since 2002. This study examined specific actions taken by nursing homes in response to the publication of the report card and their impact on quality, as measured by Quality Measures (QMs) based on health outcomes of residents.
Study Design: We combined information about individual residents' health status in the MDS (Minimum Data Set) data for periods before and following publication of the report with

information from a national random survey of nursing homes about specific actions they have taken in response to publication of the Nursing Home Compare report. Nursing homes were queried about 22 specific actions, including changes in care protocols, training, increased staffing, purchase of specialized equipment and others. We estimated random effect, linear regressions which model changes in the trends of five quality measures, as a function of intensity of activity (number of actions) undertaken by the facility and the specific actions taken. The five quality measures were deterioration in activities of daily living, infections, pressure sores, physical restraints and pain for short stay patients. The specification of the models allowed for testing hypotheses about changes in both the slope of the trend line and its level at the time of publication. Data covered 4 quarters prior to publication and 4 quarters post publications, and excluded the last quarter in 2002, during which the report was published.
Population Studied: 748 nursing homes and all individuals residing in these facilities in the period 2001-2003. Nursing homes were chosen randomly from a national sampling frame that included all facilities with at least one quality measure reported.
Principle Findings: Three of the five quality measures exhibited a significant association between changes in trend towards improvement following publication and the number of actions reported by the nursing home as taken in response to the publication. Number of actions taken was significantly (at the 0.05 level) associated with improvement in infections, pain for short term residents and physical restraints. Some of the 22 specific actions that were significantly (at the 0.05 level) associated with improvement included development of new care protocols or changes in existing protocols, and training staff for the specific quality measure.
Conclusions: Actions taken by nursing homes in response to publication of the Nursing Home Compare quality report cards were associated with improvement in some but not all quality measures. Similarly, not all actions were associated with improvement.
Implications for Policy, Practice or Delivery: This study suggests that the publication of the Nursing Home Compare report card had positive effects in some areas, and raises questions about its inability to effect change in others. Inspection of trends prior to the publication suggest that the report cards were more effective in accelerating preexisting trends towards improvement then in affecting change denovo.
Funding Source: NIA

- **The Impact of the Quality & Outcomes Framework Pay for Performanmce Scheme on General Practice Clinical Quality in the UK**

Stephen Campbell, B.A.,M.A., Ph.D.

Presented By: Stephen Campbell, B.A.,M.A. (Econ), Ph.D., Research Fellow, NPCRDC, University of Manchester, Williamson Building, Manchester, M13 9PL, England, Phone: 00441612757655,
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Research Objective: In 2004, following a series of national initiatives to improve quality of care, the United Kingdom government committed $3.2 billion to an ambitious and ground-breaking pay-for-performance scheme for family practitioners. Practices received bonus payments for achieving a range of quality targets, including 65 clinical targets for ten chronic conditions (asthma, cancer, COPD, CHD, diabetes, epilepsy, hypothyroidism, hypertension, mental health, stroke). To evaluate the impact of the scheme on performance it is necessary to assess quality of care both before and after its introduction. This presentation will refer to two projects conducted at NPCRDC, University of Manchester, UK. The Quality and Outcomes Framework Assessment project (QOFa) compares performance in the first two years of the scheme (2004/05 and 2005/06). The Quality and Incentives in Practice project (QuIP) assesses whether quality improved more rapidly following the introduction of financial incentives than before.
Study Design: QOFa: Data were extracted automatically from clinical computing systems for 7935 practices in England in the first (2004/05) and second years (2005/06) of the scheme. QuIP: Longitudinal time series design. Data were extracted from medical records of random cross-sectional samples of patients with asthma, CHD and diabetes registered with 42 representative English family practices. A total of 2300 patients were sampled in 1998, 1495 in 2003, and 1882 in 2005. Performance in 2005 was compared to that predicted by a logit model, based on observed trends between 1998 and 2003. Incentivised and non-incentivised indicators were also compared.
Population Studied: Study 1: 7935 practices in England Study 2: 42 practices in England

Principle Findings: QOFa: In the first year of the pay-for-performance scheme high levels of achievement were reported, with practices achieving a median 83.4% of the clinical targets for all incentivised conditions (IQR 78.2-87.0%). In the second year median reported achievement rose to 87.1% (IQR 84.3-89.4%). Median performance increased for asthma (year 1: 80.5%, year 2: 83.6%), CHD (year 1: 85.7%, year 2: 88.7%) and diabetes (year 1: 80.1%, year 2: 83.7%). QuIP: Quality improved for all three conditions between 2003 and 2005. Mean quality scores out of 100 in 1998, 2003 and 2005 were: 60.2, 70.3 and 84.3 for asthma; 58.6, 76.2 and 85.0 for CHD; and 61.6, 70.4 and 81.4 for diabetes. For asthma and diabetes the improvement was faster than predicted by the previous trend ($p<0.001$, $p=0.002$). For CHD, where there had been widespread quality improvement initiatives prior to 2004, continued improvement in quality was no more rapid than the previous trend ($p=0.066$). There was no significant difference in improvement comparing incentivised and non-incentivised indicators.
Conclusions: Against a background of already improving quality of care in the UK, the first two years of the pay-for-performance scheme resulted in very high levels of achievement across all ten chronic conditions - a level of achievement considerably higher than that predicted by the government. The introduction of the pay-for-performance scheme was associated with accelerated quality improvement for asthma and diabetes but not heart disease.
Implications for Policy, Practice or Delivery: Pay-for-performance may be a useful means of augmenting other approaches to quality improvement.
Funding Source: NPCRDC DH core grant

- **Did the Premier Demonstration Project Make a Difference? Assessing the National Impact of P4P & Public Reporting Initiatives**

Stephen Grossbart, Ph.D.

Presented By: Stephen Grossbart, Ph.D., Vice President, Quality Management, Catholic Healthcare Partners, 615 Elsinore Place, Cincinnati, OH 45202, Phone: (513) 639-2784, Fax: (513) 639-2762, Email: srgrossbart@health-parterns.org

Research Objective: Identify the impact of the Center for Medicare and Medicaid Services' (CMS) "Premier Hospital Quality Incentive Demonstration Project" (HQID) on quality improvement compared to other hospitals that participated in the Hospital Quality Alliance's (HQA) public reporting initiative between 2004 and 2006.
Study Design: The study compares the impact of the Premier Hospital Quality Incentive Demonstration and the Hospital Quality Alliance's public reporting initiative on quality performance between 2004 and 2006. The study compares 232 participants in the Premier HQID to 3,044 hospitals not in the project that submitted quality data as part of the HQA's reporting initiative. The study is limited to analysis of four clinical areas that are partly or fully included in the HQID: acute myocardial infarction (AMI), heart failure, pneumonia, and surgical care improvement project (SCIP). The study is based on publicly available data available on the CMS Hospital Compare web site. Data is reported quarterly on a rolling 12-month basis. The study identified from a database of 4,661 hospitals submitting data as part of the HQA a total of 3,276 hospitals that submitted data for all available quarters in the study (Quarter 1, 2004 – Quarter 1, 2006) and had complete data describing hospital characteristics. Hospital characteristics were available from a variety of sources including MedPAR and American Hospital Association Guide. The study controls for variation in hospital characteristics by using multivariate regression to control for hospital size (measured as staffed beds), the existence of graduate medical education programs, trauma centers, urban locations, and open heart programs to assess performance on overall quality using a composite opportunity quality score that was developed by Hospital Core Performance Measurement Project for the Rhode Island Public Reporting Program for Health Care Services and modified by Premier, Inc. for use in their demonstration project.
Population Studied: Hospitals submitting performance measure data as part of the HQA reporting initiative for up to twenty-one performance measures for AMI, heart failure, pneumonia, and SCIP. A total of 3,276 hospitals had sufficient data for analysis, including 232 of the 260 hospitals included in the Premier HQID. All data is available from public sources.
Principle Findings: Hospitals participating in the pay-for-performance demonstration project had greater rates of improvement in composite quality scores. The study compared from the first public posting on Hospital Compare web site for Quarters 1-2, 2004 to the most recent posting of data for the year ending Quarter 1, 2006. In this two-year period, the rate of performance across clinical conditions was

substantially higher for hospitals in the Premier demonstration. During this two-year period, performance improvement for AMI was 4.1% for demonstration project participants compared to 2.1% for non-participants. In the area of pneumonia care, the amount of performance improvement between 2004 and 2006 was 9.7% for participants compared to 6.5% for non-participants. For heart failure, the amount of improvement in the composite quality score was 6.1% for participants compared to 3.2% for non-participants. Finally in the area of surgical care improvement, where data is available beginning in the 3rd quarter of 2004, participants in the Premier HQID improved 9.8% compared to merely 1.5% for non-participants. Overall composite quality scores for three clinical areas (AMI, heart failure, and pneumonia) increased by 6.6% for participants compared to 4.3% for non-participants. The major difference in performance between the two cohorts of hospitals rested with measures that were not included in the original 10-measure "starter set" selected by the Hospital Quality Alliance for public reporting in December 2002. Hospitals in the demonstration project and those merely reporting data for the HQA initiative, performed similarly for "starter set" measures. Between 2004 and 2006, participants in the demonstration project improved performance in the 10-measure "starter set" by 6.8% compared to 5.7% for non-participants. In the remaining nine measures for AMI, heart failure, and pneumonia, Premier participants dramatically outpaced non-participants in their rate of improvement. From baseline to 2006, participants improved 12.7% compared to just 7.2% for non-participants.

Conclusions: When hospitals voluntarily agreed to submit data to CMS for the Hospital Quality Alliance's reporting initiative, focus increased dramatically on 10 key "starter set" measures. The pressure of public reporting alone improved performance in hospitals across the nation. There was little difference between hospitals in the pay-for-performance demonstration project and those only participating in the HQA reporting initiative. In contrast, in areas of clinical measurement not included in the public reporting initiative (non-starter set measures of AMI, pneumonia, heart failures, and SCIP), participants in the Premier HQID, dramatically outperformed non-participants. The pay-for-performance demonstration clearly accelerated performance improvement among participants across a diverse set of measures, however, the influence of public reporting, approached that of the pay-for-performance demonstration on the more limited set of HQA measures that were part of the original public reporting initiative. Improvement in general was limited for most hospitals for only the 10 measure "starter set." Other closely related measures in the areas of AMI, heart failure, and pneumonia did not experience the rate of improvement that participants in the Premier demonstration were able to post for the larger measure set that represented a comprehensive bundle of evidence-based care and included in the pay-for-performance project.

Implications for Policy, Practice or Delivery: This analysis provides evidence that both pay-for-performance and public reporting initiatives accelerated performance improvement among the nation's hospitals. The analysis also points out the need for broadly defined sets of measures that represent performance across the full continuum of care within each clinical condition. Understanding how providers will optimize performance is a key to designing future public reporting initiatives and pay-for-performance programs. This analysis demonstrates the need for broadly defined initiatives around clinical needs of patients to ensure that the full "bundle" of evidence-based aspects of care is delivered to target populations.

- **The Relationship Between CMS Quality Indicators & Long-term Outcomes among Hospitalized Heart Failure Patients**

Mark Patterson, Ph.D., M.P.H., Adrian Hernandez, M.D., Bradley Hammill, M.S., Eric Peterson, M.D., M.P.H., Gregg Fonarow, M.D., Kevin Schulman, M.D., M.B.A., Lesley Curtis, Ph.D.

Presented By: Mark Patterson, Ph.D., M.P.H., Post-doctoral Research Fellow, Center for Clinical and Genetic Economics, Duke Clinical Research Institute, PO Box 17969, Durham, NC 27715, Phone: (919) 668-8888, Fax: (919) 668-7124, Email: mark.patterson@duke.edu

Research Objective: Pay-for-performance initiatives assume that process-based measures of performance are related to quality and ultimately may improve clinical outcomes. The objective of this analysis was to estimate the association between CMS quality indicators for heart failure and 6-month and 1-year mortality in a large sample of elderly patients hospitalized for heart failure -- the most common cause of hospitalization in the Medicare population.

Study Design: A retrospective cohort study that used clinical registry data in combination with Medicare claims data. Hospital-level performance measures defined by CMS include (a) discharge instructions completed, (b) left ventricular ejection function (LVEF) assessment, (c) ACE inhibitors (ACEI) prescribed at discharge, and (d) smoking cessation counseling in eligible patients. A hospital-level performance score was constructed by dividing the number of eligible adherence opportunities among all patients in a hospital into the number of times correct care was delivered to those patients on the four measures described above. Mortality data were obtained from CMS vital statistics files merged to the OPTIMIZE-HF data. Multivariate logistic regressions were used to estimate the probability of 6-month and 12-month all-cause mortality conditional upon hospital-level performance scores. Generalized estimating equation methods were used to obtain robust standard errors to account for clustering at the hospital level. Models also controlled for age, gender, race, baseline creatinine and hemoglobin levels, systolic blood pressure, and weight. Models included binary indicators for the history of AMI, diabetes, cerebrovascular and peripheral vascular disease, depression, hyperlipidemia, COPD and arrhythmia. Hospital-level controls included total number of beds and the ratio of total heart failure hospitalizations to the total number of hospital discharges.
Population Studied: 21,385 Medicare fee-for-service (FFS) beneficiaries enrolled in the Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure (OPTIMIZE-HF) and discharged alive from January 2003 to December 2004.
Principle Findings: Hospital performance scores averaged 0.49 and ranged from 0.11 to 0.88 within 137 hospitals. 22% and 31% of the patients died 6-months and 12-months post-discharge, respectively. Performance scores were not associated with patient-level 6-month or 12-month mortality. Odds ratios and 95% confidence intervals for a 10-point change in hospital adherence were 0.99 (0.96, 1.03) and 0.98 (0.95, 1.02), respectively. Results did not change when defining hospitals into quartiles based upon higher or lower quality scores. Compared to individuals at higher scoring hospitals, those at lower scoring hospitals had similar probabilities of 6-month and 12-month all-cause mortalities.
Conclusions: CMS indicators of hospital-level quality of care for hospitalized patients with heart failure have little association with long-term outcomes.
Implications for Policy, Practice or Delivery: Results suggest the need to validate potential pay-for-performance measures and their ascertainment as quality indicators prior to implementation in a pay-for-performance program. Future research is needed to determine which processes of care are necessary to achieve optimal outcomes for hospitalized heart failure patients.
Funding Source: GlaxoSmithKline

Workforce

Access to Health Workforce

Chair: Thomas Ricketts, Ph.D., M.P.H.

Monday, June 4 • 9:00 a.m.-10:30 a.m.

▪ Greater Rurality Increases Barriers to Primary Health Care: Evidence of a Gradient in Access or Quality

Janice Probst, Ph.D., James N. Laditka, Ph.D., Sarah B. Laditka, Ph.D.

Presented By: Janice Probst, Ph.D., Director, Associate Professor, SC Rural Health Research Center, University of South Carolina, 220 Stoneridge Drive, Columbia, SC 29210, Phone: (803) 251-6317, Fax: (803) 251-6399, Email: jprobst@gwm.sc.edu

Research Objective: Rural residents have multiple barriers to primary health care, including lower income, sparse community infrastructure, travel barriers, and scarcity of providers. These barriers may act to reduce residents' ability to obtain care, the quality of care obtained, or both. We hypothesized that a gradient of exists, whereby increasing levels of rurality would be associated with decreasing levels of primary care effectiveness.
Study Design: We conducted a cross sectional analysis of county-level rates of Ambulatory Care Sensitive Condition Hospitalizations (ASCH), an established measure of access to primary health care of reasonable quality. We used ASCH definitions developed by the Agency for Healthcare Research and Quality. Eight levels of rurality were defined, using 2003 Urban Influence Codes. Multivariate analysis used Poisson regression. Results were adjusted for population health and sociodemographic

characteristics, including percent uninsured, provider supply, and state effects.
Population Studied: Discharges were aggregated at the county level. Discharge data were obtained from the 2002 State Inpatient Databases for eight states that report county of residence: Colorado, Florida, Kentucky, Michigan, New York, North Carolina, South Carolina, and Washington. County-level estimates of the uninsured child and adult populations were from the US Census. Physician supply, resource availability, and population demographic information were from the Area Resource File. We examined ACSH rates separately for children (age 0-17) and adults (18 64, 65+). For uninsured adults, analysis was restricted to self-pay discharges. To avoid unrepresentative outliers, we excluded counties with very small age specific populations.
Principle Findings: Adjusted ACSH rates for children did not differ notably across levels of rurality. Evidence of a rural gradient of ACSH was strong for both adult groups. In unadjusted results for ages 18-64, the ASCH rate rose monotonically across the levels of rurality, from 8 per 1,000 in the most urban counties to 14.2 per 1,000 in the most rural. Parallel results were found in adjusted analysis (most urban/most rural rate ratio 0.50, p<.001). When the analysis was restricted to uninsured adults, physician and hospital supply were inversely related to ASCH. At ages 65+, the adjusted rate of the most urban counties was only about two-thirds (rate ratio 0.68, p<.001) of the rate in the most rural counties, and again physician supply was inversely related to ASCH.
Conclusions: Increasing rurality is positively associated with ASCH, even after controlling for several markers of service availability. Unmeasured factors, including distance to care and support services such as pharmacy, may also affect use of primary care, or patient ability to implement provider-recommended self management. The inverse relationship between ASCH and physician supply in two vulnerable populations, the uninsured and the elderly, may further exacerbate problems in rural counties, where physician supply is often limited.
Implications for Policy, Practice or Delivery: Rural populations are clearly disadvantaged in their ability to access effective primary care. Agencies seeking to enhance access to care in rural areas should provide incentives to place programs and personnel in the most rural counties.
Funding Source: HRSA

▪ The Diffusion of Physicians

Thomas Ricketts, Ph.D., Randy Randolph, M.R.P.

Presented By: Thomas Ricketts, Ph.D., Professor, University of NC at Chapel Hill, 725 M.L.King Jr. Boulevard, CB 7590, Chapel Hill, NC 27599-7590, Phone: (919) 966-5541, Fax: (919) 966-5764, Email: tom_ricketts@unc.edu

Research Objective: To describe how physicians move from place to place during their practice lives and to determine whether those moves are influenced by local supply factors.
Study Design: The project matched records of individual physicians for each of the years and tracked physician movement between counties classified according to physician-population ratio and socioeconomic characteristics. Individual physician locations were tracked for two ten-year intervals 1981-1991 and 1991-2001. Multivariate logistic regression models predicting the correlates of whether a physician moved were estimated.
Population Studied: Individual records of licensed physicians from merged AMA Physician Masterfiles® for 1981, 1986, 1991, 1996, and 2001.
Principle Findings: In the two ten-year periods 1981-1991 and 1991-2001, approximately 35% of all physician moved from one county location to another. Of those who moved, 61% went to counties in another state. Women were more likely to move and physicians who recently completed medical school or a residency program were also more likely to move. The overall tendency of movers was to go to places with lower physician-to-population ratios but also to places with higher per capita incomes, smaller total populations, and lower proportions of non-white population.
Conclusions: The flows of physicians into and out of communities is a function of factors other than simple competition based on numbers of practitioners and population size. The net direction into less competitive areas reflects the relatively strong pull of other factors including lifestyle opportunities and perceived quality of life.
Implications for Policy, Practice or Delivery: Market incentives may not be the best levrs to use to re-distribute the physician workforce to provide more equitable access. Programs that intend to influence physician location should understand that incentives must consider the social and economic characteristics of locations to which physicians are sent.
Funding Source: HRSA

▪ Impact of Title VII Training Programs on Community Health Center Staffing

Diane Rittenhouse, M.D., M.P.H., George E. Fryer, Jr., Ph.D., Robert L. Phillips, Jr., M.D., M.S.P.H., Thomas Miyoshi, M.S.W., David C. Goodman, M.D., Kevin Grumbach, M.D.

Presented By: Diane Rittenhouse, M.D., M.P.H., Assistant Professor, Family and Community Medicine, University of California, San Francisco, 500 Parnassus Avenue, MU 308-E, San Francisco, CA 94143, Phone: (415) 514-9249, Email: rittenhouse@fcm.ucsf.edu

Research Objective: Community Health Centers (CHCs) are a critical component of the health care safety net. President Bush's CHCs Expansion Program set a target of doubling the capacity of CHCs by adding or expanding 1,200 center sites over 5 years. However, it is uncertain whether CHCs will be able to recruit the primary care workforce needed for this expansion. Despite evidence that CHCs are struggling to recruit adequate numbers of physicians, federal grant programs designed to prepare and motivate physicians to work in underserved settings were substantially cut in 2006. The aim of this study was to examine the association between physicians' exposure to Health Resources and Services Administration (HRSA) Title VII Section 747 Primary Care Training Grants during medical school and residency and subsequent work in a CHC.
Study Design: The 2004 American Medical Association Physician Masterfile (Masterfile) was linked, at the level of the individual physician, to HRSA Title VII grants files, Medicare claims data, and data from the National Health Service Corps (NHSC). This unique linked dataset allowed for the identification of physicians exposed to Title VII funds during training (1970-2003), NHSC participants (1972-present), and physicians staffing CHCs (2001, 2002, or 2003). Retrospective analysis was conducted to compare the proportions of physicians working in CHCs among Title VII exposed and not-exposed physicians. Two-tailed Chi square analyses were used to test the significance of differences between exposed and non-exposed groups. Logistic regression was used to examine the independent contribution of Title VII grants exposure at the medical school and residency level on working at a CHC, controlling for other factors.
Population Studied: All Masterfile physicians excluding: not active in direct patient care; residents; completed residency before 1970. Graduates of non-U.S. medical schools (could not be exposed to Title VII grants during medical school), osteopathic physicians (limited residency data), and non-primary care physicians (residency programs not eligible for Title VII grants) were excluded from selected analyses.
Principle Findings: 3.0% (5,934) of physicians exposed to Title VII funds during medical schools worked in CHCs in 2001-2003, compared to 1.9% of non-exposed physicians ($p<0.001$). This is a relative difference of 57.9%, suggesting that without exposure to Title VII, 2,210 fewer physicians might have worked in CHCs during this period. The effect of exposure to Title VII during residency was similar. In logistic regression models that included a variable for different types of Title VII grants, exposure to a predoctoral grant (OR: 1.252; 95% CI: 1.190 - 1.316), an AAU grant (OR: 1.279; 95% CI: 1.215 - 1.346), and a residency grant (OR: 1.155; 95% CI: 1.108 - 1.204) were each independently, significantly associated with working in a CHC. These odds ratios were higher among family physicians. Nearly all effects of Title VII exposure on CHC work remained significant when controlling for NHSC participation, public vs. private medical school, year of residency graduation and physician gender.
Conclusions: Exposure to Title VII grants during medical training is associated with subsequent work in CHCs.
Implications for Policy, Practice or Delivery: Understanding these relationships informs the federal effort to expand and adequately staff CHCs.
Funding Source: HRSA

▪ Access Initiative Impacts on Primary Care Provider Productivity

Paul Fishman, Ph.D., Doug Conrad, Ph.D.

Presented By: Paul Fishman, Ph.D., Scientific Investigator & Affiliate Associate Professor, Health Services, Group Health Cooperative, Center for Health Studies, 1730 Minor Ave, Suite 1600, Seattle, WA 98101, Phone: (206) 287-2925, Fax: (206) 287-2871, Email: fishman.p@ghc.org

Research Objective: To estimate the relationship between a comprehensive access improvement initiative within a closed-panel HMO -- based on primary care system redesign, direct access to specialists, same-day appointments, productivity-based variable compensation, enhanced clinical information system (CIS) and patient-provider Internet

connectivity -- and primary care provider (PCP) productivity.
Study Design: After first exploring aggregate relative value unit ("work RVUs") per FTE primary care provider over time (1998 – 2005), general estimating equation models were estimated at the individual PCP level. "Intervention time" was measured as baseline (pre-Initiative), "roll-out" (the transition period of implementation of Initiative components), and full implementation (the post-initiative), and we examined the level of productivity (work RVU per FTE) as a function of intervention time, PCP specialty, gender, years of practice in the HMO, and average case mix of the provider's panel (lagging the ACG-based case mix weight by 1 quarter to eliminate potential endogeneity in case mix). Clinic-level fixed effects and interactions with intervention time were included in the GEE model to capture unobserved differences across primary care centers (clinics) in the configuration of inputs available to PCPs over time.
Population Studied: PCPs within the closed-panel HMO whose enrollee panel included at least 500 persons during the quarter of interest (for 1998 – 2005 inclusive) and who were employed at least 0.25 FTE.
Principle Findings: PCP productivity (based on study sample descriptive statistics, not adjusted for covariates) increased gradually during the baseline period, from a starting value of approximately 1050 RVU per FTE provider to roughly 1250 nearing the end of the baseline, then rose rapidly to a local peak at approximately 1500 one quarter prior to the beginning of Initiative's roll-out, declined for the next two quarters, then rose substantially to a new local peak of 1860 RVUs per FTE in the 3 quarters of the roll-out during which productivity-based PCP compensation was introduced, next reached higher levels ranging from 1900 – 1950 RVU/FTE, before declining to roughly 1700 in the last two quarters of 2005. Multivariate, interrupted time series analyses suggest (but do not causally establish) that rising productivity during Initiative roll-out and early quarters of full implementation reflects adjustments in work expectations and PCP compensation incentives, whereas the dip in productivity in the latter quarters of 2005 is likely attributable to planned reductions in provider service loads as new requirements for provider documentation and CIS adjustments were implemented.
Conclusions: The time pattern of changes in PCP productivity strongly suggests that roll-out and full implementation of the Access Initiative were associated, respectively, with increases in PCP productivity -- facilitated by introduction of productivity-based variable compensation staffing and system supports for increased provider service loads. Conversely, some short-term diminution in productivity occurred early in implementation of the new CIS.
Implications for Policy, Practice or Delivery: Comprehensive system change geared to improving patient access, when supported by compensation incentives and staffing changes, can increase PCP productivity. However, provider service loads must be adjusted to accommodate short-term disruptions associated with CIS implementation and workflow adjustments.
Funding Source: RWJF

Health Workforce Supply

Chair: Timothy Dall, M.S.

Monday, June 4 • 11:00 a.m.-12:30 p.m.

▪ Workplace Factors that Increase Employee Satisfaction and Performance Over Time

David Mohr, Ph.D., Mark Meterko, Ph.D., Martin Charns, D.B.A., Sue Dyrenforth, Ph.D., Katerine Osatuke, M.A.

Presented By: David Mohr, Ph.D., Investigator, Center for Organization, Leadership and Management Research, Department of Veterans Affairs, VA Boston Healthcare System (152M), Boston, MA 02130, Phone: (857) 364-5679, Email: david.mohr2@va.gov

Research Objective: The objective of the study was to identify factors that influence changes in employee satisfaction and self-reported quality of work performance. A large body of literature suggests a link between job satisfaction, self-reported performance and customer satisfaction. Thus, knowing what factors drive change in these areas could serve as leverage points to allow managers to improve workgroup outcomes.
Study Design: The study utilized data from two consecutive administrations of the VA All Employee Survey (AES), a census survey consisting of three sections focused on individual satisfaction, workgroup processes and organization culture. . During the years in question the AES achieved response rates of 52% (2004) and 70% (2006). Items were rated on a five-point scale and either used as stand-alone measures or combined in multi-item

scales. For the present study, individual employee responses were aggregated to the workgroup level (n=2376). Two outcome measures were created using the difference scores of matched workgroup reports of overall job satisfaction and quality of work. Predictor variables that hypothetically can be influenced were changes in: workplace civility, management for achievement, physical material and resources, job demands, teamwork culture and bureaucratic culture. Control variables in the model were organizational complexity level, teaching affiliation, urban or rural distinction, and geographical region. Change in outcome variables were regressed in a mixed-effects model with workgroups nested within facility.
Population Studied: Employees within the Veterans Health Administration
Principle Findings: Improvement in job satisfaction was significantly predicted by increases in management for achievement (b=.27), resources (b=.22), teamwork culture (b=.24), workplace civility (b=.16), and decreases in job demands (B=-.14). The pseudo r-square indicated 55% of the variance was explained. Improvement in perceived performance was significantly predicted by increases in resources (b=.25), workplace civility (b=.09), bureaucratic culture (b=.10) and decreases in teamwork culture (b=-.07), all of which explained 15% of the variance.
Conclusions: Results indicated that changes in workplace civility, physical and material resources were significant predictors of the two outcome measures. Workgroups where these factors increased also demonstrated gains in job satisfaction and perceived performance. A mixed finding for culture was observed. A change in teamwork culture was positively related to a change in job satisfaction, but negatively related to change in quality of work. Workgroups that reported an increase in bureaucratic culture, on the other hand, showed a positive change in perceived performance
Implications for Policy, Practice or Delivery: Interventions to improve workplace civility, increased management involvement and support, and resources are likely to translate into higher rates of employee satisfaction and delivery of care.
Funding Source: VA

- Economic Evidence of a Primary Care Physician Shortage

Carol Simon, Ph.D., William White, Ph.D., Lauren A. Smith, M.D., M.P.H., Andrew Johnson, M.A., Alyssa Pozniak, Ph.D., Lois Olinger, M.C.P.

Presented By: Carol Simon, Ph.D., Principal Associate and Abt Fellow, Domestic Health, Abt Associates, 55 Wheeler Street, Cambridge, MA 02138, Phone: (617) 349-2635, Email: carol_simon@abtassoc.com

Research Objective: To use new physician survey data to examine economic evidence of the adequacy of the primary care (PC) physician workforce.
Study Design: The future of the physician workforce has always been a widely debated topic. Research has suggested that in the coming years, the supply of physicians may not adequately cover patients' health care needs. Predictions of how well the future physician workforce will meet the anticipated demand of health care services can be strengthened by incorporating economic indicators of a market shortage or surplus, including earnings trends, practice capacity, retraining, retirement plans and practice location decisions. This study develops and fields a multi-mode survey linking physician behavior to characteristics of the physician, his/her practice and the managed care environment. Data domains include physician characteristics and income, practice revenues, hours worked, practice activities, and financial condition and structure. Multivariate weighted regression and logistic regressions were used to analyze earnings, activities, and physician perceptions about the practice pressures. Data are weighted to account for sampling design and known sources of non-response.
Population Studied: A random sample of 1200 primary care (PC) and pediatric physicians in 5 states (California, Illinois, Georgia, Pennsylvania and Texas). The sample was derived from the American Medical Association Physician Masterfile. Pediatric and minority physicians were over sampled.
Principle Findings: Economic indicators evaluated in this study include market exit rates (retirement and other), specialty type switching, acceptance of new patients, physician age, practice structure changing, number of weeks worked per year, as well as wage trends, and practice earnings. If there was a pending physician shortage, economic indicators in the physician employment market would indicate higher than normal market exit rates, few physicians switching specialties or accepting new patients, a higher average physician age, static physician practice structures, physicians working near the maximum weeks per year, as well as rising wages and practice earnings. A pending

physician surplus would drive economic indicators in the opposite direction. Preliminary results show no overall evidence of a current shortage of PC physicians. However, there is evidence of shortages in faster-growing areas and potentially a worsening shortage in already underserved communities. Earning trends, patient-care capacity, and hours worked are significant indicators of changing demands on primary care physicians. Higher planned retirement rates among physicians serving minority communities suggest that these underserved areas may face growing shortages in the short-term future.
Conclusions: The findings suggest that there may be maldistribution in primary care capacity, especially in areas that are already underserved and are characterized by high numbers of minority and low-income patients.
Implications for Policy, Practice or Delivery: This research contributes to a better understanding of primary workforce policy and underscores the need to use economic incentives and develop better policy tools for assuring adequate primary care capacity in currently underserved communities.
Funding Source: AHRQ, California Endowment, Commonwealth Fund

- Metrics & Correlates of African Health-worker Migration to the United States, United Kingdom, and Seven Other Wealthy Destinations

Onyebuchi Arah, M.D., Ph.D., Chukwudi E. Okeke, M.D., Uzor C. Ogbu, M.D., M.Sc.

Presented By: Onyebuchi Arah, M.D., Ph.D., Assistant Professor, Department of Social Medicine, Academic Medical Center, University of Amsterdam, Meibergdreef 9, PO Box 22700, Amsterdam, 1100 DE, Netherlands Phone: +31205664892, Fax: +31206972316, Email: o.a.arah@amc.uva.nl

Research Objective: Some 57, mostly African, countries face crippling health-worker shortages, with global deficits easily exceeding 2.4 million. A major contributor to the shortages is migration of physicians and nurses to rich western countries. Two commonly used migration metrics are: absolute numbers of émigrés, and the proportion of the source country's health-workforce that has emigrated — the emigration fraction. The magnitude and pattern differences painted by these and other metrics have never been researched. We studied (a) the effect of type of migration metric on quantifying the extent, patterns and correlates of African health-worker migration, and (b) whether African countries which lost more physicians also lost more nurses to the same destinations.
Study Design: We used a new database on cumulative bilateral net migration of nurses and physicians from 53 African countries to North America, Europe, Australia, and South Africa. These data were then merged with workforce, health, health system, social, and economic data from the World Health Organization, United Nations, and World Bank to profile African source countries. First, we ranked African countries on the magnitude of migration using three metrics: absolute numbers of émigrés, emigration fraction, and health-worker migration density (a new metric we recently defined as the number of African nurse or physician émigrés per 1000 source country population). Second, we used correlations and multivariable regressions to pattern migration according to the health-workforce, health status, health system expenditure, and economic and social development profiles of African countries. Third, we examined the correlations between nurse and physician migrations to the US, UK and the other seven destinations, separately and combined.
Population Studied: The 53 African countries which supplied the most African-born nurses and physicians to the United States (US), the United Kingdom (UK), Canada, Australia, France, Belgium, Portugal, Spain, and South Africa, as of 2002.
Principle Findings: Rankings based on any of the three migration metrics differed substantially from those based on the remaining two. Only the health-worker migration density was consistently associated with African countries' differential profiles. Higher health-worker migration was seen among African countries with relatively higher health workforce capacity, health status, health spending, and development. The most important correlate of both nurse and physician migration was African countries' human development index. African nurse and physician migrations to the US correlated highly with those to the UK but not with migration to the other seven destinations.
Conclusions: The magnitude, pattern, and correlates of migration are sensitive to the migration metrics used in the analyses. Migration seems to increase with the level of development of African countries, and those countries which lose relatively more physicians also lose more nurses.
Implications for Policy, Practice or Delivery: Health-workforce policies must look into the

conceptual, methodological, and interpretational issues surrounding migration metrics before reliably considering the causes, consequences, and solutions of health-worker migration. The current separate handling of the debate on nurse and physician migrations should be abandoned for a more comprehensive integrated approach. To achieve the Millennium Development Goals, all issues surrounding African health-workforce demand critical analyses and enduring commitment.

▪ Estimating the Marginal Costs of Financing Physician Training in the US.

Martey Dodoo, Ph.D., Robert Phillips, Jr., M.D., M.S.P.H.

Presented By: Martey Dodoo, Ph.D., Senior Economist, The Robert Graham Center, 1350 Connecticut Avenue, NW, Suite 201, Washington, DC 20036, Phone: (202) 331-3360, Fax: (202) 331-3374, Email: mdodoo@AAFP.org

Research Objective: There is currently debate on whether to expand the US physician workforce and how to finance it. Whether an expansion is achieved through development of new training programs or expansion of current programs, the financing options seem limited. There is very little in the literature on the marginal costs of training physicians. Congress is reluctant to change the current financing method under Medicare without credible evidence on current costs per student. The purpose of this study is to determine the annual direct marginal costs of financing physician training in the US.
Study Design: We used financial and enrollment data from AAMC and AACOM, Federal GME payments from CMS Medicare Hospital Cost Reports, State Medicaid GME payments from National Conference of State Legislatures, and residency positions data from ACGME. We also used comparison data from earlier government estimates of physician training costs and evaluations. We estimated marginal costs associated with expanding the capacity of current medical schools and residency programs, based on established marginal costing methods for higher education (Allen and Brinkman, 1983). We derived a realistic assessment of actual educational costs which were estimated to be 29% of revenues in allopathic and 69% of revenues in osteopathic schools. We did not include payments for patient care in teaching hospitals or development costs associated with building new schools or new teaching hospitals. We considered alternative methods for calculating the costs including various regression techniques.
Population Studied: Students in US Medical schools and medical residents in teaching hospitals and other residency sites.
Principle Findings: During 2000-2007, we found marginal costs of US allopathic school training ranged from $190,000 to $250,000 a year per student, osteopathic school training costs ranged from $55,000 to $83,000 per year, and medical resident training costs ranged from $75,000 to $106,000 a year per resident. We also found significant variation in GME payments to teaching hospitals and possible shortfalls in payments to some hospitals (see earlier study: Fryer, 2001). Our marginal cost results were significantly close and comparable to estimates from earlier reports (e.g.: NORC, 2006; Blewett et al, 2001). Our estimates remained robust even when we used alternative costing methods.
Conclusions: The annual direct marginal costs of financing physician training in the US are substantial and vary considerably.
Implications for Policy, Practice or Delivery: Physician education sites are often at risk, shouldering limited clinical reimbursements and bearing the significant costs required to train physicians. Knowing the marginal cost should help such educators plan how to advocate with policy makers for necessary financial support as well as organize to maintain financial viability. If there are still irregular payment variations at physician education sites then workforce policy may not be satisfactorily implemented using the current financing approaches. Alternative approaches for funding have to be considered.

Nursing Workforce

Chair: Joanne Spetz, Ph.D., M.A.

Monday, June 4 • 4:30 p.m.-6:00 p.m.

▪ Are Nursing Staff Adequate to Meet the Changing Resident Demands in Rural Nursing Homes

Ning Zhang, M.D., Ph.D., M.P.H., Lynn Unruh, Ph.D., R.N., Thomas Wan, Ph.D., M.S.

Presented By: Ning Zhang, M.D., Ph.D., M.P.H., Assistant Professor, Health Administration, University of Central Florida, 3280 Progress Drive, Orlando, FL 32826, Phone: (407) 823-3344, Email: nizhang@mail.ucf.edu

Research Objective: This study accesses whether the level and type of nurse staffing meet the increasing and changing demands of resident care in rural nursing homes, and whether there is a potential maldistribution of nurse staffing mix across specific demands of rural nursing home residents.
Study Design: Nine-waves of longitudinal nursing home data from the Online Survey, Certification, and Reporting (OSCAR) annual survey were merged as a major analytical database. Trend analyses were used to examine the direction and extent to which the changes in nurse staffing are consistent with the changes of resident demands from 1997-2005. For each type of nursing staff (RN, LPN, NA and total nurses), the trend with resident demands was linked in two ways: RNs were trended with special care and Medicare beds; LPNs with medications and catheters; NAs with ADLs and pressure sores; and total nursing staff with higher acuity and higher severity-adjusted deficiencies.
Population Studied: Trend analyses were conducted separately for all CMS -certified, Medicare only, Medicaid only, and private-pay only rural nursing homes. The study population included 50,118 facilities (on average 5,568/year) after data cleaning on both staffing and demand variables.
Principle Findings: Preliminary trend analysis results indicate that nurses per resident per day, nurse skill mix, and resident care demands change at different rates and directions. Mismatches were evidenced between increasing resident demands and decreasing or more slowly increasing staffing. Increases in severity-adjusted deficiencies also outpaced staffing capacity. Decreases in staffing were more likely to occur with RNs, whereas increases were more likely to be with NAs, irrespective of resident needs. Although resident demands have been increasing in all types of nursing homes, Medicare-certified-only facilities most consistently demonstrated a reverse staffing pattern for RNs, whereas Medicaid-certified-only nursing homes had consistent increases in RNs.
Conclusions: The capacity of rural nursing home staffing appears to have lagged behind the increasing demands of nursing services in recent years. Continuous staffing reductions at all levels in Medicare-certified-only nursing homes is worth attention. In order to achieve quality improvement in rural nursing homes, nurse staffing should match resident demands.
Implications for Policy, Practice or Delivery: Nurse staffing has been perceived as one of the key factors in improving nursing home performance, while resident demands have been recognized as key factors in measuring nursing adequacy by the Institute of Medicine Committee on the Adequacy of Nurse Staffing in Nursing Homes. It is imperative to understand the dynamic relationships between resident demands and staffing capacity in rural nursing homes. Knowledge on how to improve nurse staffing and appropriately adjust their skill mix will help federal and state policymakers and rural nursing home administrators strengthen the quality of care and better prepare for the changing resident care needs of the upcoming elderly and diverse populations requiring rural nursing home care.
Funding Source: CMS

- **Methods for Indentifying Facilities and Communities with Shortages of Nurses**

Paul Wing, D. Engin., Sandra McGinnis, Ph.D.

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Research Objective: To develop methods to identify facilities and communities with shortages of nurses
Study Design: A number of methods for estimating the extent of nursing shortages in facilities and counties were examined in this study.
Population Studied: A number of populations were studied, including counties in the U.S., and facilities and counties in NC, ND, and NY
Principle Findings: 1. Subjective measures of shortages created problems when validation of the results was attempted. 2. Data sets are available to support systematic assessment of nursing shortages at the county level, but not at the facility level. 3. More research on shortage designation methods is desirable. 4. Shortage estimation is least reliable for inner city areas (because commuting patterns are not well defined) and very rural areas (due to sampling issues in available data sets). 5. Additional validation of numerical results is needed before implementation of a new method.
Conclusions: Our "preferred method" estimates the extent of RN shortages in counties across the U.S. This method appears to be significantly better than existing methods used by HRSA, and there is room for further refinement and improvement. A number of other methods (e.g.,

factor analysis to better understand workforce and demographic patterns related to nursung shortages) also proved interesting. Methods requiring facility data gave good results, but the required data are available in few states.
Implications for Policy, Practice or Delivery: This study revealed that better methods can be developed for identifying facilities and communities with shortages of nurses. The resulting information should be useful for policy makers at the national, state, local, and facility levels.
Funding Source: HRSA

- Forecasting Health Workforce Supply and Demand: From the Survey to the Models

Joanne Spetz, Ph.D.

Presented By: Joanne Spetz, Ph.D., Associate Professor, Community Health Systems, University of California, San Francisco, 3333 California Street, Suite 410, San Francisco, CA 94118, Phone: (415) 502-4443, Email: jojo@alum.mit.edu

Research Objective: Many nations are facing shortages of Registered Nurses (RNs) and other health professionals. Within the United States, the U.S. Bureau of the Health Professions has conducted surveys of RNs since 1977, and has periodically published forecasts of the supply, demand, and shortage of RNs. The state of California also has conducted surveys of RNs and developed its own shortages. The ability of statistically-based surveys, and econometric and stock-flow forecasting models to predict future health workforce supply and demand needs close examination. This paper critically assesses strategies to forecast supply and demand for health professionals, using the RN workforce as an example.
Study Design: We begin by reviewing methods for obtaining data about the RN workforce, from surveys and administrative data. We compare the patterns of employment and demographics identified in different datasets and identify potential causes for discrepancies. Second, we review methods for forecasting the supply of RNs. Most approaches to estimating future supply focus on stock-and-flow models. Third, we review methods for forecasting the demand for RNs. Here, there is substantial divergence in the literature. Some researchers use RN-per-capita ratios as a proxy for demand. Others create simple forecasts from current RN-per-patient ratios and forecasts of future hospitalization rates. A third approach involves developing econometric models. The results of these three strategies will be compared using California as a case study. We then will examine how forecasting strategies can be applied to regions within a nation or other jurisdiction, again using California as an example. Finally, we will compare forecasts that have been published over time, to learn how accurate these forecasts have been. The findings of this assessment will be discussed in the context of general development of health workforce forecasting models.
Population Studied: Registered Nurses in California who were surveyed in 2006.
Principle Findings: Data analysis is underway. The 2006 Survey of California RNs has been completed, and a final report, with forecasts, is due to the government before May 2007.
Conclusions: Research is underway. Previous models demonstrated that the U.S. Bureau of Health Professions forecasts of demand for RNs in California did not predict demand well.
Implications for Policy, Practice or Delivery: A careful examination of health workforce forecasting strategies, with a focus on the economic factors that affect supply and demand, will help states, provinces, cities, and nations better assess whether and how to plan for future health workforce needs.
Funding Source: California Board of Registered Nursing

- Nurse Staffing Ratios: Trends & Policy Implications

Patrick Conway, M.D., R. Tamara Konetzka, Ph.D., Jingsan Zhu, M.B.A., Kevin Volpp, M.D., Ph.D., Julie Sochalski, PhD, RN, Ph.D., R.N.

Presented By: Patrick Conway, M.D., Instructor and Robert Wood Johnson Clinical Scholar, Robert Wood Johnson Clinical Scholars Program, University of Pennsylvania, 423 Guardian Drive, Blockley 1303A, Philadelphia, PA 19104-6021, US, Phone: (215) 573-2573, Fax: (215) 573-2742, Email: pconway2@mail.med.upenn.edu

Research Objective: At least 25 states are considering nurse staffing legislation, including many with mandated staffing ratios. Therefore, we aimed: 1. To describe the trends in nurse staffing ratios and staffing mix from 1993-2003; 2. To determine hospital characteristics associated with being below proposed minimum nurse staffing ratios.
Study Design: We utilized nurse staffing hours for registered nurses (RNs), licensed vocational nurses (LVNs), and nurse aides (NAs) and

patient days for general medical surgical units to calculate staffing ratios for each hospital year. We determined hospital characteristics (ownership status, location, market competition, percentage of Medicaid/uninsured patients, and teaching status) associated with being below proposed ratios. Safety net hospitals were defined as hospitals with high percentage of Medicaid/uninsured patients (>1 SD above mean) or urban non-profit or government hospitals. A priori defined ratios were based on ratios in implemented in California in 2004 and 2005, respectively: minimum of at least 1 nurse (RN+LVN) per 6 patients and 1 nurse (RN+LVN) per 5 patients; and ratios considered in other states: 1 nurse (RN only) per 5 patients and 1 nurse (RN+LVN) per 4 patients.

Population Studied: All short-term acute care general hospitals in California 1993-2003, total of 381 hospitals with 3420 hospital staffing years.

Principle Findings: Overall, the median nurse (RN+LVN) staffing ratios had no significant increase from 1993-99 and then increased significantly by 20% from 1999-2003. The proportion of nurse staffing provided by LVNs decreased significantly from 1993-2003 and LVNs represented only 10% of the licensed (RN+LVN) nurse staffing hours by 2003. In 2003, less than 6% of hospitals were below a minimum ratio of at least 1 nurse (RN+LVN) to 6 patients but 22% of hospitals were below a ratio of 1:5. 41% of hospitals were below a RN only ratio of 1:5 and 58% of hospitals were below a ratio of 1 (RN+LVN) nurse per 4 patients. For all ratio cut-offs, the following types of hospitals were more likely to be below ratios than their counterparts: government-owned, urban, those in more competitive markets, non-teaching, and hospitals with high percentage of Medicaid/uninsured patients. If one considers the 65 hospitals in 2003 below a minimum ratio of 1 (RN+LVN) nurse per 5 patients, then 49 (75%) of the hospitals are considered "safety net" hospitals.

Conclusions: California originally passed nurse staffing ratio legislation in 1999 and although many factors could account for this trend, nurse staffing then increased significantly from 1999-2003. Although the optimal nurse staffing ratio is not known, a 1:6 ratio establishes a minimum floor and few hospitals fell below this floor at baseline. Urban, government-owned, and high Medicaid/uninsured population hospitals, specifically hospitals comprising the safety net, are more likely to struggle to meet proposed minimum ratios.

Implications for Policy, Practice or Delivery: Legislation mandating minimum nurse staffing ratios disproportionately affects safety net hospitals, typically without a proposed mechanism or funding to meet these ratios. Since 52% of safety net hospitals had negative operating margins in 2003, these safety net hospitals may be forced to make trade-offs and restrict access to care and services or divert funds from other needs with unintended negative consequences for patients.

Funding Source: RWJF