

WHAT DNA CAN AND CANNOT SAY: PERSPECTIVES OF IMMIGRANT FAMILIES ABOUT THE USE OF GENETIC TESTING IN IMMIGRATION

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Genetic technologies are being implemented in areas that extend beyond the field of medicine to address social and legal problems. An emerging example is the implementation of genetic testing in the family petitioning process in immigration policy. This use of genetic testing offers the potential benefits of reducing immigration fraud and making the process more efficient and accessible for immigrants, especially those without documentation. However, little is known about the positive or negative impacts of such testing on immigrant families and

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their communities. This study collected empirical data through family interviews to understand the experiences and attitudes of individuals who have taken a DNA test to prove a family relationship for immigration purposes.

Based on study results, we present a set of recommendations to improve the processes with which DNA testing is applied to immigration cases. We argue that DNA testing might serve as a useful tool for families who lack documentary evidence of a family relationship. However, testing might also reveal sensitive information, such as misattributed parentage, that can damage relationships and cause serious harm to beneficiaries, especially children. Petitioners should be provided with adequate information to form an understanding of the DNA test and its implementation as well as the positive and negative consequences from using it, in order to carefully assess whether DNA testing will help their case. We recommend that additional protections be put in place to safeguard children from the potential impacts of misattributed parentage or disclosure of hidden social adoptions. This research provides empirical evidence to inform policy related to the use of genetic testing in immigration.

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INTRODUCTION

Mr. Ahmed¹ emigrated as a refugee from Africa to the United States after being separated from his family during his country's civil war. His child stayed behind. Shortly after becoming a U.S. resident, Mr. Ahmed petitioned the U.S. Citizenship and Immigration Services (USCIS) to bring his child under the family reunification provision of the Immigration and Nationality Act (INA).² His child's birth certificate had been lost during the unrest of his country's civil war; therefore, he did not have the required documentation to prove his relationship to his son.³ As a result, an immigration officer asked Mr. Ahmed to take a DNA test⁴ to verify the claim in his immigration petition that he was the child's biological father.⁵ DNA test results showed, however, that he was not the biological father of the child. This unexpected finding left him struggling emotionally and carried significant negative consequences for his child. It also made the prospect of reuniting with his child difficult, if not impossible.

Mr. Ahmed's story illustrates how genetic technologies are being used to address issues with verifying identity and family relationships for immigration purposes.⁶ The administrative implementation of a policy governing the use of DNA testing for immigration purposes first occurred in 2000, making such testing available as a tool to resolve issues of suspected fraud, stolen identities,

1. This is an actual case from an interview conducted by the author. The names and details from the case were modified to protect the identity of the individual and family members.

2. Immigration and Nationality Act § 203(a)(2)(A), 8 U.S.C. § 1153(a) (2013).

3. *See, e.g.*, 8 C.F.R. § 204.1(f)(1) (2013) (discussing documentation requirements); *id.* § 204.2(d)(2) (2013) (listing types of documentation for child-parent relationship); DEP'T OF HOMELAND SEC., OMB NO. 1615-0012, INSTRUCTIONS TO FORM I-130 PETITION FOR ALIEN RELATIVES 3 (2014) [hereinafter INSTRUCTIONS TO FORM I-130], available at <http://www.uscis.gov/sites/default/files/files/form/i-130instr.pdf> (discussing types of documentation).

4. DNA (deoxyribonucleic acid) is a molecule present in all cells of the body. It carries genetic information. A DNA test is a chemical test that compares the DNA of two family members to determine if they are related. For simple introductions to DNA, see *Introduction to DNA*, A PRIMER IN DNA STRUCTURE AND FUNCTION, <http://seqcore.brcf.med.umich.edu/doc/educ/dnapr/pg1.html> (last visited Apr. 15, 2015); BBC Knowledge & Learning, *BBC Knowledge Explainer DNA*, VIMEO (Feb. 28, 2013), <http://vimeo.com/60747882>.

5. *See* 8 C.F.R. § 103.2(b)(2)(i) (2013) (discussing necessity of secondary evidence); 8 C.F.R. § 204.2(d)(2)(v) (2013) (describing sources of secondary evidence).

6. *See, e.g.*, Anna Gorman, *DNA Testing Increases in Immigration Cases*, L.A. TIMES, June 26, 2006, at B1, available at <http://youscript.com/uploads/pdf/LAimmig.pdf>; Miriam Jordan, *Refugee Program Halted as DNA Tests Show Fraud*, WALL ST. J., Aug. 20, 2008, at A3; Peter Prengaman, *DNA Testing More Common for Immigration Applications*, DAILY HERALD, July 27, 2006, at A8.

and inadequate documentation in family reunification cases.⁷ The possibility of fraud is a concern in the current document-based system for validating family relationships.⁸ Genetic testing is perceived as an effective way to screen out fraud, making the process of family reunification less onerous for immigration officials and immigrant families and more accessible for applicants who lack documentary evidence.⁹

Although there has been some discussion in the literature about genetic testing in immigration¹⁰ and the potential effects it may have on immigrant families, empirical evidence is needed to better understand immigrants' experiences with genetic testing in the immigration context, their attitudes towards it, and the consequences that can result from their experiences with test results. To address these questions, we conducted interviews with immigrant families who have been through genetic testing for family reunification to develop a fuller picture of the issues surrounding the application of genetic testing for family reunification. In this article, we provide background information about the current use of genetic testing in immigration and describe experiences of families with testing, including the positive and negative impact test results have had on those individuals and their families.

7. Memorandum from Michael D. Cronin, Acting Executive Associate Commissioner, Immigration & Naturalization Servs., Guidance on Parentage Testing for Family-Based Immigrant Visa Petitions (July 14, 2000) [hereinafter Cronin Memorandum]; Recommendation from Khatri Prakash, CIS Ombudsman, to Dr. Emilio T. Gonzalez, Dir., U.S. Customs & Immigration Servs., Recommendation to Accept DNA Tests as Secondary Evidence of Family Relationship 3-4 (Apr. 12, 2006), *available at* <https://www.dhs.gov/xlibrary/assets> [hereinafter Prakash Recommendation]; *see also* Sahli Evelyn, Diffusion of DNA Testing in the Immigration Process 97-98 (Dec. 2009) (unpublished M.A. thesis, Naval Postgraduate School), *available at* <https://www.hsdl.org/?view&did=30647>.

8. Immigration and Nationality Act (INA), Pub.L. 89-236 § 274(c), 79 Stat. 911 (1965) (codified at 8 U.S.C. § 1324(c)) (criminalizing document fraud and listing penalties); *see also* MICHAEL JOHN GARCIA., CONG. RESEARCH SERV., RL32657, IMMIGRATION-RELATED DOCUMENT FRAUD: OVERVIEW OF CIVIL, CRIMINAL AND IMMIGRATION CONSEQUENCES 1-13 (2006); Ruth ELLEN WASEM, CONG. RESEARCH SERV., RL34007, IMMIGRATION FRAUD: POLICIES, INVESTIGATIONS AND ISSUES 1-17, (2007); Jordan, *supra*, note 6.

9. *See* Prengaman, *supra* note 6, at 1-3; Prakash Recommendation, *supra* note 7, at 3-4.

10. *See generally* JILL EBENSHADE, AN ASSESSMENT OF DNA TESTING FOR AFRICAN REFUGEES (2010); JACKIE TAITZ, EXPLORING THE USE OF DNA TESTING FOR FAMILY REUNIFICATION 1-37 (2001); Alan R. Davis, *Are You My Mother? The Scientific and Legal Validity of Conventional Blood Testing and DNA Fingerprinting to Establish Proof of Parentage in Immigration Cases*, 1994 BYU L. REV. 129 (1994); Tera Rica Murdock, *Whose Child is This? Genetic Analysis and Family Reunification Immigration in France*, 41 VAND. J. TRANSNAT'L L. 1503 (2008); Jackie Taitz, J.E.M. Weekers & D.T. Mosca, *DNA and Immigration: The Ethical Ramifications*, 359 LANCET 794 (2002); Jackie Taitz, J.E.M. Weekers & D.T. Mosca, *The Last Report: Exploring the Use of DNA Testing for Family Reunification*, 6 HEALTH & HUM. RTS. 20 (2002); Janice D. Villiers, *Brave New World: The Use and Potential Misuse of DNA Technology in Immigration Law*, 30 B.C. THIRD WORLD L.J. 239 (2010); Sahli, *supra* note 7.

Based on the data gathered in this study, we present a set of recommendations for ways in which genetic testing can be applied in immigration cases that minimize its potential negative impact and increase its benefits. Our interviews reveal that genetic testing can make the process of family reunification more accessible for immigrants who lack proper documentation. However, DNA testing can also prevent the legitimate reunification of some families and cause significant harm to their welfare. Therefore, we argue that information about DNA and the possibility of DNA testing should be provided at the beginning of the family reunification process, while recognizing that its use may be relevant only in a minority of cases. The information provided should include sufficient explanation about the nature of the test and testing process, how results are presented, and the possible positive and negative consequences of testing to permit petitioners and beneficiaries to give informed consent. Additionally, the voluntary nature of the test should be emphasized. Furthermore, we recommend that immigration lawyers be educated about the test, the testing process, and the potential positive and negative consequences of test results so they can better advise their clients.

I. BACKGROUND

Immigration for the purposes of family reunification is provided for in the INA.¹¹ This provision grants citizens and legal permanent residents the benefit of petitioning for certain relatives to immigrate to the United States.¹² It gives immigration priority to immediate family members,¹³ such as children, spouses, parents, and siblings, and accounts for the majority of immigrant visas in the United States. In 2012, sixty-six percent of immigrants who became legal permanent residents in the United States were family petitioned.¹⁴ The reunification provision has been valued as an important component of U.S. immigration policy, benefiting both the immigrant population living in the United States and the United States as a whole.¹⁵ The INA allocates an annual quota of visas for family reunification.¹⁶

11. Immigration and Nationality Act § 203(a)(2)(A), 8 U.S.C. § 1153(a) (2013).

12. The legal status of petitioners determines what family members they can bring. Citizens can petition for their spouses, parents (if the petitioner is twenty-one years or older), children (unmarried, under twenty-one years old) and brothers or sisters. Legal permanent residents can only bring their spouses and children (unmarried, under twenty-one years old), and sons and daughters (unmarried, twenty-one years old years or older).

13. In this Article, we use the term “immediate family members” to refer to the children, spouses, parents, and siblings of petitioners in general. It is not to be confused with the statutory term “immediate relatives,” used in the INA to refer only to the immediate family members of U.S. citizens. *See* 8 U.S.C. § 1151(b)(2)(A)(i) (2013).

14. RANDALL MONGER & JAMES YANKEY, OFFICE OF IMMIGRATION STATISTICS, DEPT. OF HOMELAND SECURITY, U.S. LEGAL PERMANENT RESIDENTS: 2012, ANNUAL FLOW REPORT 1 (2013).

15. SELECT COMMISSION ON IMMIGRATION AND REFUGEE POLICY, U.S. DEP’T OF EDUC., U.S. IMMIGRATION POLICY AND THE NATIONAL INTEREST: SUPPLEMENT TO THE FINAL REPORT

U.S. citizens and legal permanent residents¹⁷ (LPRs) (the petitioners) who formally petition that a relative be permitted to immigrate to the United States must have proof of their claimed family relationship with that relative (the beneficiary).¹⁸ Because the policy is intended to provide a benefit only for specific family members, verifying the alleged family relationship is important in immigration law.¹⁹ The assumption is that relatives are biologically related to the petitioners, with the exception of spouses and relatives who have been legally adopted.²⁰ Proof of relationship is usually established by submitting primary legal documents, such as marriage and birth certificates and adoption papers.²¹ When primary documents are not available, secondary documents such as affidavits can be used.²² Genetic testing is a tool currently available to U.S. immigration officers, but only in a very limited way.²³ Immigration officers cannot require genetic testing to establish a claimed biological relationship,²⁴ but “in situations where credible evidence is insufficient to prove the claimed biological relationship, officers may suggest and consider DNA testing results.”²⁵ In other words, immigration officers may suggest DNA testing when documents are missing, fraud is suspected, or documentary information is incomplete or suspected of being incorrect. The decision to suggest testing is solely at the discretion of the immigration officer.

AND RECOMMENDATIONS OF THE SELECT COMMISSION ON IMMIGRATION AND REFUGEE POLICY 2-988 (1981).

16. The minimum annual quota for family-sponsored immigrant visas is 226,000. *See* Immigration and Nationality Act § 201(c)(1)(B)(ii), 8 U.S.C. § 1151(c)(1)(B)(ii) (2013); BUREAU OF CONSULAR AFFAIRS, U.S. DEP’T OF STATE, VISA BULLETIN: IMMIGRANT NUMBERS FOR JUNE 2013 (2013). However, there is no quota for the immediate relatives of U.S. citizens: spouses, unmarried children under age twenty-one, and parents. *See* Immigration and Nationality Act § 201(b)(2)(A)(i), 8 U.S.C. § 1151(b)(2)(A)(i) (2013).

17. Legal permanent residency (LPR) refers to the immigration status of a person in the US. A legal permanent resident has permission to lawfully live and work in the United States.

18. Immigration and Nationality Act § 291, 8 U.S.C. § 1361 (2013) (establishing burden of proof); 8 C.F.R. § 204.2(d)(2) (2013) (discussing required evidence).

19. 8 C.F.R. § 103.2(b)(1) (2013).

20. *Id.* § 204.2(d)-(g) (2013) (discussing process of petitioning for a family member and sources of evidence).

21. *Id.* § 204.1(f)(1) (2013); *see, e.g.*, INSTRUCTIONS TO FORM I-130, *supra* note 3, at 3.

22. *See* 8 C.F.R. § 103.2(b)(2)(i) (2013); *id.* § 204.1(f)(1); *id.* § 204.2(d)(2)(v).

23. Thus far an immigration official has no “statutory or regulatory authority to require DNA testing.” Cronin Memorandum, *supra* note 7, at 2.

24. *Id.* at 2; *see also* 9 U.S. DEP’T OF STATE, FOREIGN AFFAIRS MANUAL § 42.44 N3(b) (2015) [hereinafter FOREIGN AFFAIRS MANUAL], available at <http://www.state.gov/m/a/dir/regs/fam>; Memorandum from Michael L. Aytes, Assoc. Dir., Domestic Operations, U.S. Citizenship & Immigration Servs., Genetic Relationship Testing, 2 (Mar. 19, 2008) [hereinafter Aytes Memorandum].

25. Aytes Memorandum, *supra* note 24, at 2.

A. *Implementation of the DNA Testing Policy*

DNA testing policy was officially implemented on July 14, 2000, through an administrative memorandum written by Michael D. Cronin, then Executive Associate Commissioner of the United States Citizenship and Immigration Services (USCIS).²⁶ The goal of the memorandum was to “provide guidance” to the USCIS field offices about using DNA testing for parentage verification within the family reunification process.²⁷

The policy has several key facets. It states that testing is voluntary in that the immigration official may only suggest, not require, DNA testing.²⁸ The policy also cautions immigration officers that DNA testing should only be used when necessary.²⁹ Per the policy, DNA testing must be paid for by the petitioners.³⁰ The cost of the test may vary across laboratories.³¹ Applicants must choose an accredited laboratory from a list provided by immigration officers, contact the chosen laboratory directly, and schedule the testing.³² Once the immigration official in charge of the case receives the test results, he or she weighs the test results in the context of other evidence and makes a decision.

Under the current policy, DNA testing essentially functions as the gold standard to validate the authenticity of the claimed relationship in cases where documents cannot validate it.³³ The usefulness of DNA testing as credible evidence of family ties is described in the policy with words like “a means of establishing the relationship.”³⁴ To support the claim of a biological relationship, DNA test results have to show a probability of parentage or kinship equal to or greater than 99.5 percent, the standard threshold for proof.³⁵ While this threshold marks the standard, the policy also cautions immigration

26. See generally Cronin Memorandum, *supra* note 7 (establishing policy). At least sixteen countries and one province have passed or considered legislation for genetic testing in family reunification. See TAITZ, *supra* note 10, at 13-22; Llilda Barata, Genetic Testing in Immigration for Family Reunification: Ethical, Legal and Social Implications (2012) (unpublished Ph.D. thesis, University of Washington), available at <https://digital.lib.washington.edu/researchworks/handle/1773/22022>.

27. Cronin Memorandum, *supra* note 7, at 1.

28. 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(b); Aytes Memorandum, *supra* note 24, at 2; Cronin Memorandum, *supra* note 7, at 2.

29. See Cronin Memorandum, *supra* note 7, at 2-3; see also 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(b).

30. See 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(c); Aytes Memorandum, *supra* note 24, at 2; Cronin Memorandum, *supra* note 7, at 2.

31. Elizabeth S. Panke, Alan E., Donnenfeld & Louise Wilkins-Haug, *Parentage Testing using DNA*, UPTODATE, http://www.Uptodate.com/contents/parentage-testing-using-dna?source=search_result&search=parentage+testing&selectedTitle=1~14 (last updated June 25, 2013).

32. See 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N6; Aytes Memorandum, *supra* note 24, at 3; Cronin Memorandum, *supra* note 7, at 5.

33. Sahli, *supra* note 7, at 59; see also Prakash Recommendation, *supra* note 7, at 4.

34. Cronin Memorandum, *supra* note 7, at 2.

35. 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N1(b).

officers that “no parentage testing, including DNA testing, is 100 percent conclusive.”³⁶

If the immigration official does not decide in favor of the petitioner on an application, the petitioner or the immigration lawyer has the right to appeal the decision to the Board of Immigration Appeals (BIA),³⁷ the highest administrative appellate body in the immigration system.³⁸ If the petitioner decides to appeal the BIA decision, he or she can pursue the case in federal court.³⁹

Based on a legal review of twenty-six family petition cases spanning from 2005 until 2009, there were two cases that involved the appeal of DNA test results to the BIA.⁴⁰ Both cases were resolved at the BIA and were not appealed to a higher court. In *BIA v. Phillip*, the plaintiff argued against the cancellation of her petition after her DNA test result fell under the 99.5 percent standard required to prove the relationship. The plaintiff argued that the 99.5 percent standard was unjust and unreasonable. While the court noted that the standard was based on scientific rationale, it afforded the plaintiff an opportunity for reappraisal of the DNA results in concert with other data. This case involved a question of half-siblings which, the Appeals Board suggested, required more nuanced consideration.⁴¹ In the second case, *BIA v. Nativita Fontaine*, the plaintiff appealed the revocation of his visa petition for his daughter after the DNA test showed he was not the father.⁴² The plaintiff argued that the test results were wrong and wanted to be tested again. The court dismissed the appeal on the grounds of the DNA test results but noted that, if another DNA test established paternity, a new visa petition could be submitted.

The lack of cases challenged in higher courts may reflect the lack of resources that many immigrants have to pursue this option. It may also point to the precedent set by blood testing (ABO typing) cases in immigration⁴³ ABO typing determines the blood type (A, B, AB, O) a child has inherited, and compares it to those of the alleged parents to ascertain parentage. In many of

36. Cronin Memorandum, *supra* note 7, at 2. The Foreign Affairs Manual also cautions immigration officers that DNA testing “does not necessarily yield conclusive results.” see 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(b).

37. 8 C.F.R. § 1003.1 (2013) (discussing powers and jurisdiction of BIA).

38. See *id.* § 1003.1(b)(5); see also DEP’T OF JUSTICE, BOARD OF IMMIGRATION APPEALS PRACTICE MANUAL § 9.2, at 105 (2013), available at <http://www.justice.gov/eoir/vll/qapracmanual/BIAPracticeManual.pdf>.

39. 8 U.S.C. § 1252(a)(1) (2013).

40. Barata, *supra* note 26, at 30-38.

41. *In re Maria Janice Phillip*, No. A98 416 355, 2008 WL 762735, at *1 (B.I.A. 2008) (“[P]etitioner shall also be afforded an opportunity to present evidence or explanation regarding why there would be a disparity in the DNA test results setting forth a 99.5% probability that she is a half-sister to Louise and that the beneficiary is a half-sister to Louise while there is a lesser probability that she is the half-sister to the beneficiary.”).

42. *In re Nativita Fontaine*, No. A098-461-812, 2005 Immig. Rptr. Lexis 5558 (Bd. Immigration Appeals Nov. 30, 2005).

43. Davis, *supra* note 10, at 133-35; Barata, *supra* note 26, at 30-38.

the ABO typing testing cases that were appealed to higher courts, the courts gave greater weight to the scientific validity and evidence of the ABO test than the testimony or document-based evidence of the petitioner.⁴⁴ It is possible that the exacting standard associated with ABO blood typing, a well-understood scientific method, has been transported to DNA testing.

B. Testing Procedures

When a petitioner and beneficiary decide to proceed with a DNA test, the petitioner has to choose a parentage testing laboratory in the United States that has been accredited by the American Association of Blood Banks (AABB).⁴⁵ Immigration officers only accept test results from these laboratories.⁴⁶

Laboratory personnel collect DNA samples in person from the petitioner.⁴⁷ For the beneficiary, the lab sends a DNA testing kit to the U.S. embassy or consular office in the country in which the beneficiary is residing.⁴⁸ There, an authorized American official witnesses the sample collection conducted by a designated laboratory technician.⁴⁹ DNA samples are collected using buccal swabs, rubbing the inside of the cheek with a piece of cotton to dislodge the cells.⁵⁰

The beneficiary's sample goes through a strict chain of custody to protect its integrity.⁵¹ This includes verifying and confirming the identity of the petitioner and beneficiary.⁵² The sample is then sent to the same laboratory as

44. *E.g.*, *In re LFF*, 5 I. & N. Dec. 149, 157 (1953) (concluding, after taking into consideration federal court cases and scientific literature on the subject, that blood group tests, properly performed by competent technicians, can disprove paternity conclusively in cases where there was incompatibility of blood); *see also* *Ying v. Dulles*, 137 F. Supp. 470, 472 (D. Mass. 1956) (deciding that blood testing is a conclusive type of evidence).

45. Aytes Memorandum, *supra* note 24, at 4; *see* 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N6 (2014); *see also* AABB Accredited Relationships (DNA) Testing Facilities, ASS'N BLOOD BANKS, <http://www.aabb.org/sa/facilities/Pages/RTestAccrFac.aspx> (last visited Apr. 16, 2015).

46. Aytes Memorandum, *supra* note 24, at 3.

47. 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N7(c).

48. *Id.* §§ 42.44 N8-N9.

49. *Id.*

50. *Id.* § 42.44 N2(a).

51. *Id.* §§ 42.44 N7, N8 (j)(5-9), N11(a-b). The chain of custody to protect the sample is important especially after one laboratory uncovered that three percent of the DNA samples they were receiving from beneficiaries in Ghana were fraudulent. Petitioners and close relatives of petitioners were "recycling their genotypes" by giving their blood samples to beneficiaries, who were either unrelated individuals or distant relatives. In some cases, the phlebotomist was bribed to replace the blood. Because laboratories get hundreds of samples, they may not notice that genotypes have been recycled unless they implement standards to look for fraud. *See generally* Robert E. Wenk, *Detection of Genotype Recycling Fraud in U.S. Immigrants*, 56 J. FORENSIC SCI. S243 (2011).

52. 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N8 (i). Like beneficiaries, petitioners in this study had to provide identification before being tested in their laboratory of choice.

the petitioner's sample for analysis.⁵³ Test results are sent to the immigration officers responsible for each case.⁵⁴ Petitioners also receive a copy of the results, but only if they request one.⁵⁵ Results are usually sent by mail to the petitioners, though some laboratories also give the results to petitioners in person. The test consists of assessing the DNA sequence present at each of several locations in a person's DNA, allowing for comparison of the degree of similarity between two people. Each location that is assessed is called a single tandem repeat (STR) locus. A single tandem repeat is a short DNA sequence (e.g., AGAT) that repeats itself many times in the same location, or *locus*, in the DNA.⁵⁶ The size and length of the repeating sequence (e.g., AGAT, AGAT, AGAT) varies, producing different kinds of STRs, referred to as *alleles*.⁵⁷ For example, the STR named TH01 has TCAT as a repeating sequence in the DNA.⁵⁸ In some individuals this sequence repeats in tandem six times, but in others it repeats seven or nine times. Therefore, six, seven, and nine are alleles of the TH01 STR locus.⁵⁹ The principle of using STRs for testing relatedness in immigration is that related individuals, compared to unrelated individuals, are more likely to share many of the same STR alleles due to inheritance.

Table 1 presents an example of a test result sent to immigration officers and petitioners. In this example, the results for a child are compared to those of the alleged mother and father. The child has two alleles for each STR locus, one inherited from the mother and one from the father. Laboratories look at the alleles of the child and assess whether they are consistent with those of the alleged father and mother. The test includes results from several STR loci to increase accuracy, because most alleles may be present in the population, so that a child could share a particular allele with the alleged parents by chance. To determine the likelihood of this occurring, a paternity index (PI) is calculated for

53. *Id.* § 42.44 N9. Polymerase chain reaction (PCR) is usually used to amplify and genotype ten to twelve single tandem repeats (STRs) loci in the DNA samples. STRs or microsatellites are nucleotide repeats (e.g., CACACA) that appear in tandem on an individual's DNA. STRs are highly variable markers showing length polymorphism that differ among individuals in a population. The likelihood that a set of STRs has descended directly from one individual to the next, as is expected to happen within families, is expressed in terms of a probability. This probability determines the degree of relatedness between two persons. Even though parentage testing is accurate in most cases, some factors can influence the parentage probability including the mutational rate of STRs used for the test, the prevalence of different alleles in the local population, and the number of family members tested and the relationships of people who are tested. See John M. Butler, *Genetics and Genomics of Core Short Tandem Repeat Loci Used in Human Identity Testing*, 51 J. FORENSIC SCI. 253, 258 (2006); Robert E. Wenk, *Testing for Parentage and Kinship*, 11 CURRENT OPINION HEMATOLOGY 357, 359 (2004).

54. 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N10.

55. *Id.* § 42.44 N10(b)(3).

56. Butler, *supra* note 53, at 253.

57. *Id.* at 255.

58. JOHN M. BUTLER, FORENSIC DNA TYPING: BIOLOGY, TECHNOLOGY, AND GENETICS OF STR MARKETS 85-123 (2005).

59. *Id.*

each STR loci.⁶⁰ The PI is a ratio of two probabilities⁶¹: (1) the probability of observing the alleles in the child given that the alleged parents are the true parents, and (2) the probability of observing the alleles given that the alleged parents are a random man and woman. Based on the results at several STR loci, a combined paternity index is calculated, estimating the likelihood that the petitioner(s) is the parent of the beneficiary.⁶² Results are accompanied by an explanation, such as: “The observed combination of genetic markers of the involved parties is 3,704,277 times more characteristic of paternity by (petitioner’s name) than of paternity by an untested, unrelated (Hispanic/Caucasian/African) man. The probability of the stated outcome, assuming a 50% prior chance is 99.999%.”⁶³ As shown in Table 1, this explanation is accompanied by a report with findings provided in a technical terminology.

60. IAN W. EVETT & BRUCE S. WEIR, *INTERPRETING DNA EVIDENCE* (1998).

61. *Id.*; AM. ASS’N OF BLOOD BANKS (AABB), *STANDARDS FOR RELATIONSHIP TESTING LABORATORIES* 119-125 (7th ed. 2005).

62. AM. ASS’N OF BLOOD BANKS (AABB), *supra* note 61, at 125

63. GENELEX CORPORATION, *REPORT: UNDERSTANDING YOUR RESULTS* (2012).

Table 1. Example of a DNA Test Result (Genelex Corporation, 2012)

STR Locus	Mother		Child*		Father		PI
	Alleles	Alleles	Alleles	Alleles	Alleles	Alleles	
D3S1358	15	16	15	15	15	15	2.5428
TH01	6	7	7	7	7	9	1.6521
D18S51	15†	16	15†	17‡	14	17‡	3.1073
Penta_E	7	16	16	12	8	12	3.0248
D5S818	9	12	12	9	9	10	1.4678
D13S317	11	13	13	10	10	13	5.5679
D7S820	12	12	12	10	10	10	3.6914
D16S539	9	10	10	12	11	12	1.8069
CSF1PO	10	11	11	12	12	12	2.8758
Penta_D	10	15	15	14	8	14	7.9719
vWA	16	17	16	19	17	19	7.6383
D8S1179	8	14	8	14	8	14	2.0472
TPOX	12	12	12	12	8	12	2.0472
AMELOGENIN	X	Y	X	X	X	Y	not applicable

* For example, for the STR locus, D18S51, the child has one allele (marked with †) in common with the mother, and one allele (marked with ‡) in common with the father.

The AABB collects aggregate statistics regarding DNA relationship testing from accredited laboratories.⁶⁴ However, these statistics are not broken down to include the number of individuals who get tested for immigration purposes. For this reason, it is difficult to determine how often DNA relationship testing is being used for immigration purposes.⁶⁵ The only available statistic that we could find was provided by Mary K. Mount, a DNA testing expert, for a New York Times article, where she estimated that “about 75,000 of the 390,000

64. See *Relationship Testing Annual Reports*, AM. ASS’N OF BLOOD BANKS, <https://www.aabb.org/sa/facilities/Pages/relationshipreports.aspx> (last visited Aug. 9, 2015).

65. We contacted the AABB to inquire about the current availability of statistics regarding the number of people using genetic testing for immigration purposes. The AABB responded that they do not maintain such statistics at this moment. Additionally, in a recommendation written by the CIS Ombudsman to the Department of Homeland Security in 2006, the point was raised that, “USCIS does not maintain any statistics on the DNA testing of its customers. USCIS does not require or request DNA testing statistics from the labs that perform testing on behalf of USCIS customers. Consequently, USCIS does not possess such basic information as the volume of testing, inclusion and exclusion rates from different countries.” See Prakash Recommendation, *supra* note 7.

DNA cases that involved families in 2004 were immigration cases.” Of those, she estimates, “15 percent to 20 percent do not produce a match.”⁶⁶

II. EXPERIENCES WITH DNA TESTING IN FAMILY REUNIFICATION

The DNA testing policy exists to benefit both government interests (such as reducing fraud) and immigrant interests by providing an alternate means to prove family relationships. However, the potential impacts of this policy have not been fully examined. For this reason, we conducted interviews with families who have undergone genetic testing to prove family relationships in immigration cases to understand their experiences with testing. We used the qualitative method of thematic description to analyze the interviews. Through an iterative process of reviewing transcripts, coding, and critical reflective writing (explained in more detail in Part D), thematic description aims to elicit rich descriptions of the participants’ experiences and identify the central themes that are key to understanding the phenomenon of interest within and across the participants.⁶⁷ It also allows for an examination of both hidden and taken-for-granted assumptions and knowledge about those experiences.⁶⁸

A. *Participants*

Participants included men and women who were eighteen years of age and older and who: (1) were U.S. citizens or legal permanent residents, or had an unexpired visa; (2) had or were in the process of petitioning for their mother, father, daughter, son, and/or siblings; (3) had given DNA samples to prove their alleged family relationship to the USCIS or the State Department; and (4) were able to participate in an interview conducted in English or Spanish.

B. *Recruitment*

Families were recruited through immigration lawyers. Contact was made with 267 practicing immigration lawyers in Washington State and 79 lawyers in the states of Oregon, California, New York, Minnesota, and Florida. Lawyers were invited to disseminate information about this study to eligible petitioners, beneficiaries, and other family members involved in the family petitioning process. They were not compensated for this role. Petitioners and/or beneficiaries who expressed interest in participating or wanted more information either gave their lawyers permission to give us their contact information or contacted us directly. We explained the purpose and details of

66. Rachel L. Swarns, *DNA Tests Offer Immigrants Hope or Despair*, N.Y. TIMES, Apr. 10, 2007, at 2-4.

67. Jennifer Attride-Stirling, *Thematic Networks: An Analytic Tool for Qualitative Research*, 1 QUALITATIVE RES. 385 (2001).

68. *Id.*

the study to interested petitioners and beneficiaries, and answered their questions. If they decided to participate, a first interview was scheduled. Petitioners were also invited to share information about the study with other family members who had experienced the DNA testing process and might be interested in participating in the study. A copy of the consent form explaining the study and risks of participating was sent to participants via mail or email.⁶⁹ Before the first interview, we spoke with each family member by phone to review the consent form and answer questions.

C. Data Collection

Each family participated in two in-person or telephone interviews conducted in either English or Spanish, according to the interviewee's preference. During the first interview, participants were asked about their experiences with DNA testing, their thoughts about it, and how they define and understand their familial ties to one another. These interviews lasted from sixty to ninety minutes. The second interview was a follow-up interview, which lasted from thirty to sixty minutes, and provided an opportunity to ask clarifying questions and explore themes that surfaced in the first interview. A list of sample interview questions is provided in Table 2.

69. The consent form was available in English and Spanish.

Table 2: Sample Interview Questions

-
- Who do you consider a member of your immediate family and who do you consider a relative?
 - What role does your family play in your life?
 - Would you tell me more about why you took a DNA test?
 - Did you know at that time what a DNA test was?
 - Would you tell me more about your experiences during the testing process?
 - Did you have any concerns?
 - Would you tell me more about the test results?
 - What were your experiences and that of your family after learning about the results?
 - What effects did the results have on you, your beneficiary, and your family?
-

The study received approval from the Institutional Review Board (IRB) at the University of Washington Human Subjects Division. Participants gave consent⁷⁰ before the start of the first interview. Participants were also asked for their permission to audio record the first and second interviews. Participants received a \$20.00 gift card after each interview.⁷¹

D. *Data Management and Analysis*

The twenty interviews (two per family) were audio-recorded and transcribed, producing 306 single-spaced pages for analysis. All transcripts were edited to remove any identifying information, such as names or specific references to people, places, events, legal status, or other details that could be used to identify family members. Analysis involved a three-step process aided by a qualitative data analysis program, Atlas.ti,⁷² which was used to facilitate

70. The consent process involved explaining the purpose of the study; the structure of the interviews (with question examples) and their duration; the rights of the participants; potential discomforts and benefits; protection of confidentiality, anonymity and privacy; the participants' freedom to withdraw from the study at any time and/or not answer any questions; and the participants' participation as voluntary.

71. Each of the interviews included in the study were conducted as approved by the University of Washington Institutional Review Board. In keeping with federal standards for research involving human participants, the IRB mandated that participant confidentiality be maintained to the extent possible. During the process of informed consent, participants were assured that personal identifiers would not be revealed in any reporting of research findings. Consequently, citation information such as the participant name and interview location that would be provided in other settings, such as interviews conducted by journalists, have been omitted.

72. See *Quick Tour*, ATLAS.TI, <http://atlasti.com/manuals-docs/#Quick-Tour> (last visited June 5, 2015).

coding transcripts, generating code reports, and visualizing relationships between the codes into a code network.⁷³ The first step, open coding, is done by reading through each transcript and assigning codes (one-word keywords) to sections of the text that represent concepts that are pertinent to the topics covered by the interview questions. This step was done for all the transcripts.

The second step involves generating code reports that collate the excerpts from all the transcripts associated with a particular code into one document, which was then read to synthesize the main ideas or actions associated with that code. For example, the code “cost” was identified in twelve of the twenty transcripts. Code memos were written after reviewing all the text associated with the coded excerpts as a way to summarize the range and frequency of issues related to costs (i.e., different kinds of costs—social, economic, and time) and what circumstances were reported along with the mention of those costs.

The third step involves examining all the relationships between the codes by clustering similar codes together to create broader themes. This was done using the network tool in Atlas.ti, which facilitates the creation of a map of codes as a “web-like illustration”⁷⁴ of the interrelationships between the codes to help explore and interpret how codes and concepts relate to each other in terms of content and co-occurrence (i.e., concepts mentioned together in a single paragraph).⁷⁵ This too allowed us to reduce the many codes into a smaller set of five distinct themes that capture the key elements of the experience;⁷⁶ these are reported below in Part III.

E. *Enrolled Families*

Fourteen families expressed interest in the study, but only ten chose to participate. While we had hoped that our recruitment strategy would generate a sample that represented experiences from around the globe, the majority of participants were from Africa (n=8 families). The other two families were from Asia (n=1) and Latin America (n=1). All persons except one immigrated to the United States either as refugees or through the Diversity Visa Program of USCIS.⁷⁷ The remaining case came as a student. Therefore, our conclusions and recommendations may be limited to the specific circumstances of these individuals. Nonetheless, these accounts highlight issues that should be explored with all immigrants to verify how relevant they are to the life and cultural experiences of people from all parts of the world.

73. See KATHY CHARMAZ, *CONSTRUCTING GROUNDED THEORY: A PRACTICAL GUIDE THROUGH QUALITATIVE ANALYSES* 42-72 (2006); Attride-Stirling, *supra* note 67, at 388.

74. Attride-Stirling, *supra* note 67, at 388.

75. *Id.*

76. *Id.*

77. See Immigration and Nationality Act § 203(c), 8 U.S.C. § 1153(c) (2006). The Diversity Visa Program is a lottery system offered on an annual basis and administered by the Department of State. It gives 55,000 immigration visas every year through a lottery system to persons from countries that have low rates of immigration to the United States.

The participants comprised a total of twelve individuals, of which half were men. In total, eight participants were interviewed alone, each representing a family. Three were interviewed with another family member or friend (Table 3). When asked about motivations for participation, participants expressed a desire to improve the process and make things better for others by sharing their experiences.

Most participants were petitioning or had petitioned for their children. One had petitioned for his mother and sister, and another had petitioned for her brother. Some had already brought family members through the petitioning process. Others had started the process two or three years prior to our interview or, in some cases, had been waiting for ten years or more to reunify with their children. All used an immigration lawyer to help them with the petitioning process.

Table 3: Participants' Characteristics

Family	Petitioner	Study Participants Interviewed	Beneficiary	Documentation	Reunification	Continent of origin*
1	Father	Petitioner, Friend	1 Child	Yes	Yes	Africa
2	Mother	Petitioner, Husband	2 Children	Yes	Yes	Africa
3	Father	Petitioner	3 Children	No	In process	Africa
4	Son	Petitioner	Mother Sibling	No No	Yes No	Asia
5	Mother	Petitioner	6 Children	No	Yes for 4 biological, no for 2 adopted	Africa
6	Mother	Petitioner	1 Child	No	Yes	Africa
7	Father	Cousin	2 Children	Yes	In process	Africa
8	Father	Petitioner	3 Children	No	Yes	Africa
9	Father	Petitioner	2 Children	No	Yes for 1 child	Africa
10	Sister	Sister-in-law	Brother	Yes	In process	Latin America

* Seven African countries were represented in this study.

III. RESULTS

The major finding from this study is that the use of DNA testing to prove family relationships in immigration has an inherent duality: it can help families, but it can also hurt them. As one participant said, DNA testing “is a good thing and a bad thing at the same time.” As will be discussed in detail, DNA testing does provide immigrants with an alternate path to reunification when the typical document-based approach is not viable or accessible. However, it can also have unintended consequences that can impact the well-being of the immigrants and their families. To better explain this duality, we grouped the major issues raised in the interviews into five sub-themes: (1) lack of documentation; (2) cost and time of testing; (3) immigrants’ understanding of DNA testing; (4) interpretation of test results; and (5) negative results and impact on family identity. We elaborate on these sub-themes below.

A. Testing in the Absence of Documentation and Government Infrastructure

One of the major benefits of DNA testing in immigration cases is that it can provide an alternate source of reliable data to prove family relationships when documentary evidence is suspect, missing, or inaccessible. Providing adequate documentation to prove familial relations can be difficult for a number of reasons, including war or other forms of civil disturbance, lack of governmental infrastructure, corruption, and poverty.

Many of these reasons for lacking documentation were reported in this study. Some participants neither had nor could acquire the necessary documents to support their applications because they had fled from their countries of origin, escaping war, civil unrest, or violence. For them, acquiring a birth certificate was not an option. Especially for refugees who left their country of origin during wartime, documents were burned, lost, or destroyed in the conflict or left behind when they fled their homes. In other cases, interviewees reported that they could never return to their countries to find documents for their beneficiaries, who most often were children, because their lives would be in danger. In these cases, DNA testing offered a way to provide the evidence they needed to support their alleged family relationships: “I was fighting to bring the children. . . . They wanted me to get the birth certificates and at that time that was impossible, because they escaped from the war. All the government agencies had been broken. They didn’t have any [place to obtain a] birth certificate.”

Even under peaceful circumstances, birth certificates can be hard to come by in many developing countries. The infrastructure for birth registration is unavailable or not well developed in many of the participants’ countries of origin. Even where birth registration is available, birth certificates usually cost money. With most study participants living at poverty level, paying for a birth certificate was a luxury:

[When] the child is born, they kick you out [of the hospital], pretty much. And so there's no birth certificate, no nothing. And then, if you [want a birth certificate] the mother would have to go back to the birth hospital, to ask them. . . . It costs money to get it.

Since birth certificates are not used in their countries for identification or to receive benefits, people often choose not to get them. Consequently, some petitioners and beneficiaries did not get birth certificates from their governments until they needed them for the family reunification petition. To obtain a birth certificate, some spent months navigating corrupt bureaucratic processes that were costly and sometimes required the payment of bribes. As one interviewee noted, "They keep the records, [but] even if you want your record, you have to pay [a] bribe." Getting an affidavit can be equally challenging, especially when witnesses have died. It is often a long bureaucratic process that "becomes [an] immediate expense and harassment. . . . I know a lot of people who'd just give up."

Regardless of the reason for their lack of documents, in all of these cases the participants saw DNA testing as a way to provide evidence to replace the birth certificate and a chance to fight for the reunification of their families.

B. *Cost and Time*

The cost of the test and the time it took to process it were prevalent themes in the interviews. The cost of the DNA test is borne by the petitioners and comes in addition to other costs associated with the immigration process, such as immigration fees and lawyers' fees. Most families were taken by surprise at the cost of the DNA test, which ranges from \$400 to \$1000 or more depending on the lab and number of family members tested.⁷⁸ However, some found the DNA test worth the cost because it saved time over continuing to pursue document-based means of proof. Additionally, some were surprised at the time it took to process the DNA test, especially when it became a burden that challenged the reunification process.

The majority of families described the added time and financial costs of DNA testing as a burden. The cost for the test required additional delays while petitioners worked for months to save funds to pay for it. This was stressful for participants, most of whom had been waiting for more than three years for a decision regarding their petitions. Lacking jobs or having low-paying jobs made paying for the test difficult for seven of the ten families. Some petitioners saved for months or borrowed from family members to be able to pay the DNA

78. See, e.g., *DNA Test Price Differences—How to Shop Smart*, DNA JUNCTION (Jan. 10, 2014), <https://web.archive.org/web/20130903080321/http://dnajunction.com/tests/price-differences.php> (accessed by searching for DNA Junction in the Internet Archive index); see also *Why Are the Prices So Different?*, DNA JUNCTION (Jan 6, 2014), <https://web.archive.org/web/20090106012633/http://www.dnajunction.com/tests/price-differences-why.php> (accessed by searching for DNA Junction in the Internet Archive index).

testing fees in addition to the immigration application fees. One interviewee said, “I worked hard, and then I will eat sometimes two, three days, cheese and rice with oil. [The] money which I have I want to save for my children to see them again.”

The minority who did not find it financially burdensome had jobs and viewed testing as a good investment. One participant said, “I don’t see cost as a big issue, because people spend [a] lot more money to process the immigration [petition].”

Some participants did not understand why immigration officers did not tell them about DNA testing when they started the petitioning process. They felt they could have saved time and money over the course of the immigration process if they had utilized DNA testing earlier. One participant commented:

They could have called them ahead of time [and told them that] DNA testing is required, they would have [then] gotten everything they needed including the DNA testing. . . . if there is something little, a little piece missing, then they put you back in the bottom of the file.

Although some participants perceived DNA testing as beneficial, they also expressed frustration when testing delayed the processing time of their petitions by three to six months, mostly due to the time required to collect samples from beneficiaries at the U.S. embassies. This was troublesome for families who thought that DNA testing would speed up the family reunification process rather than slow it down. DNA testing became a burden especially when they waited anxiously for the tests results to be returned before their immigration petitions expired. If their petitions had expired, they would have had to start the petitioning process all over again, including paying the fees. In the case of one participant, the embassy lost the beneficiary’s DNA testing kit three times. As a participant pointed out, the waiting time made the cost of the test seem less acceptable:

[Y]ou have to go find money and then on top of that the process takes longer for them to petition for the family. It took two months just to get the DNA kit over there and then back again. It was all about almost three months, forever to be done. That was just time wasted, putting the process on hold.

In summary, in most cases, the cost of the test was burdensome, although a few families felt the cost was reasonable. The added time required for DNA testing was also a concern. These concerns could have been mitigated if a better understanding of the availability, cost, and timing of DNA testing had been available at the beginning of the immigration process.

C. Understanding DNA Testing

Most petitioners who were interviewed for this study were not familiar with DNA testing prior to starting the family petitioning process, even though they had been legally residing in the United States for some time. Their first introduction to DNA testing came when USCIS or the State Department suggested it as a source of evidence to support their family petitions. As one

participant said, “We [came] to know DNA here. But back home we [did not] know DNA.” The concept of DNA and using DNA testing to prove family relationships is not common in their countries of origin. Participants reported that their communities are learning about DNA from beneficiaries who are being petitioned by family members living in the United States and Europe and have had to take the test.

Neither petitioners nor beneficiaries received information that explained the DNA test or its risks and benefits. Several petitioners learned about DNA and DNA testing from other sources, including people who had taken the test or knew about it, their lawyers, or the testing laboratories. Beneficiaries learned about the test from petitioners or other community members who were going through the same process.

Because of the lack of adequate information at the beginning of the process, petitioners’ and beneficiaries’ views about DNA testing evolved with their experiences throughout the petitioning process. Most participants saw the test as a tool that would “tell the truth” about their biological ties with beneficiaries, thus helping their applications. One participant stated his belief that, “DNA [tells] the truth. I think you need to trust DNA.” He said, “I [wanted to] give Government and Immigration proof.” However, at least one participant expressed skepticism for the test’s ability to correctly prove relationships. “My concern is [about] trusting the DNA. How sure is it to tell you this is not your father?” Others saw DNA testing as one more requirement they needed to meet so that their applications could move forward. Despite the fact that the official immigration policy says that DNA testing can only be suggested, not required, most participants felt they had no choice. They were worried that if they did not comply, their petitions might be terminated. Some did not understand why they were being asked for a DNA test when they had provided the required documents to prove their relationship. However, they were all eager to have the petitioning process finalized so that they could reunite with their families and move on with their lives, especially since most of them had been waiting years to do so and generally saw DNA testing as a means to that end. One participant’s story demonstrates the utility of the test in the absence of documents: “I need DNA because I need my son. Now he is almost fourteen years old. Can you imagine? I just see [him when he was] four months.”

During the process, many immigrants developed misunderstandings about both DNA testing and its role in the family reunification process. Some did not realize that DNA testing could reveal unknown information about biological ties. They assumed that it would provide evidence to help their petitions be accepted. In some cases this was so, but in others the opposite was true. They also believed that testing would make the administrative process go faster, thus shortening the time to family reunification. This was not necessarily so in most cases, as is stated in the DNA testing policy. As a result of not understanding the nature of the DNA test, its pros and cons, and its purpose in the overall immigration process, some immigrants developed erroneous beliefs about what

the test would accomplish for them. These misunderstandings made it challenging for them to make fully informed decisions during the process.

D. *Challenges with Interpreting Results*

Closely linked to the lack of prior knowledge about DNA testing is the issue of interpreting the results of the test. DNA test results are delivered to petitioners directly from the laboratory. Beneficiaries do not receive a copy. Results are presented in a technical format using scientific terminology, and little to no interpretive material is provided.⁷⁹

Participants noted that when results were delivered, they were difficult to interpret, especially when participants did not know how to read English or knew limited English. Some participants could not understand the scientific terminology used by the testing laboratories to explain what the results meant and how they were derived, even those who felt comfortable with English. Not knowing exactly what to make of her results, one participant seemed to read too much into the meaning of them: “My son . . . was 99.9999% and my daughter... was 99.9989%. So I said, oh, he is more my kid than her.” Most participants asked other family members, friends, or immigration lawyers to help them understand the results.

These comments reflect the difficulty associated with providing results in a format meant for experts, which assumes a certain level of knowledge about DNA and parentage testing. Not presenting the test results in an easy-to-interpret format creates the possibility of misinterpretation of the results. This in turn could lead to misunderstandings about family relationships, which could negatively impact the beneficiaries, especially if they are children.

E. *Negative Results and Family Identity*

The most difficult and damaging outcomes of DNA testing arose in situations where test results showed misattributed paternity. Seven families who participated in this study obtained test results that supported their alleged family relationships. However, three families had to cope with the consequences of the DNA test unexpectedly revealing sensitive information. Testing uncovered unknown misattributed paternities and caused one participant to reveal two adoptions that had been kept secret to protect those involved within the socio-cultural context. This caused significant problems for petitioners and beneficiaries, whose relationships suffered and had to be abruptly redefined.

Discovering misattributed paternity was very difficult for the families who went through the experience. One participant’s family had been separated during war. The participant had gone through extreme lengths to find them,

79. *See supra* Table 1.

hopeful that they could reunite in the United States. Lacking documents to prove the relationship, he took a DNA test. Unexpectedly, his DNA test showed that he was not the child's biological father. He said:

It was a shock to me. I didn't believe it; I couldn't believe that this would ever happen. So my heart was just . . . I had started feeling heart palpitations. I started sweating, [getting] sick . . . because I love her a lot . . . I didn't know what to tell her. So, it was more than a week [that] I wasn't able to go to work because that was very sad . . . It is a big loss to me, it's a huge loss, because somebody that I knew [as] my biological [child], and I just have all this kind of love for her . . . It nearly affected [my relationship with her], but it didn't affect [it] completely because if I deny her, who was going to be the father? The DNA [test] cost me a lot of money, time and then tears and even caused me to have problems . . . Sometimes I feel like it's unnecessary for them to ask for the DNA. But, also if it's not because of this DNA, my [child] could have been here!

The participant felt as if his child had been suddenly taken out of his life. He had raised the child since birth and had been sure he was the father. He did not understand what had happened; he trusted his wife. Out of all the things he had gone through in his life, including being tortured, he thought the DNA test results had the most impact on his physical health.

The child also felt the loss of her father and her identity as his daughter. He said of her:

She was very bitter, she was not eating, crying a lot of times and then she called me. All the time she used to tell me she wanted to kill herself. I said, "No, don't kill yourself," and then I was able to console her. She knew that she [would not] be able to join me here. So I told her . . . "I want to adopt you." So I was trying to find a way for this adoption. I contacted some adoption groups and they said now she has to go to the orphanage home, a lot of things.

In another case, DNA testing also revealed unexpected attributed paternity, where one petitioner abruptly discovered he was the father of children who had been conceived during his wife's first marriage. "I was expecting [that] I had one child with my wife. . . . DNA certified that I [fathered] all [three] children." This revelation not only confused the children but also the community where they lived. Community members started reacting against the children by calling them "bastards" and excluding them from social circles. They were stigmatized and rejected by the community. "They cannot stay in that community. I was scared [that] my wife [would] get hurt or harmed. That's the one thing it's very hard for us. Also . . . the other children tease [my children] at school."

Although the petitioner was glad that the DNA testing showed all the children were his, this unexpected information brought serious consequences for his family. The situation was exacerbated by the fact that his wife and children could not immediately immigrate. They had to cope with this information without one another's support while waiting for the completion of the family reunification process. The time involved in having a successful family reunification can take several years; in some cases, reunification is not achieved. This means that family members and children may have to endure the

long-term effects of these types of revelations while family members are separated and unable to provide mutual support and regular communication.

In the third case, an adoption was revealed, which forced a very painful conversation when the petitioner had to disclose the secrets of adoption to her children. She said, "I took [the children] since their mother passed away, so they didn't know they [had] another mother. . . . I feel like I killed them when I said [to them] they are not my children." The children had known her all their lives as their mother and became puzzled, not understanding why they were not her children anymore, why they did not belong with her. She said, "One of my children asked me, '[Why do] you want to show people we are not your children, because we are your children?'"

Proving children are adopted may be difficult for some families who come from countries that do not have adoption documents, as had occurred in this case. One reason for this is that informal adoptions are common in many countries and may not involve a legal process or even be termed "adoptions." One participant said, "I heard [about] adoption in [the] United States. [In my country] I never heard [about] adoption because it's [a] small country [and] nobody knows the legal [system]."

Another remarked, "Here you have to be [legally adopted] . . . but it doesn't have to be legal as long as you're willing to do that."

Families often decide to take in a child and raise them, frequently without telling the child, or the community. In countries that are plagued by war, infectious diseases like HIV, and poverty, taking a child into one's family is a common and important practice, even if not legally recognized. Families may also raise children of relatives who have died or children of relatives who cannot afford to feed or educate their children. It is the way communities help to raise children in a wide array of circumstances. In some communities, family members are expected to never tell the child that he or she is not a biological sibling. Several participants spoke about this: "I know at least in my culture when the kids are adopted nobody tells the siblings . . . that this kid is adopted. They think that they are the real siblings, as they should. But open adoption is not a common thing in [my country]."

As the above issues illustrate, revealing adoption or discovering misattributed parentage resulted in significant disruption of relationships, the erosion of trust, and the transformation of individuals' identities, affecting not only the individuals involved but also their communities. In the context of immigration, the disruption of relationships was life-altering for the petitioners and the beneficiaries, especially children. Disclosing this kind of information to children was something participants had to grapple with without any kind of guidance or support. Petitioners needed to disclose the information to prevent inconsistencies between testimonies during immigration interviews. The difficulties associated with making these disclosures were exacerbated by the geographic separation and distance between family members and the inability of most petitioners to travel to their country of origin to communicate this information to their children in person. Children had to remain in their country

of origin while petitioners found a way to legally adopt them. In two of the cases discussed in this section, the petitioners were not able to reunify with their children. One of the children succumbed to a disease while waiting for the adoption process to start, and the others were older than sixteen and thus no longer eligible for adoption.

Participants also noted that disclosure of misattributed paternity can be harmful for women. In countries where women are subject to discrimination and often lack social and political power, misattributed paternity can have serious social repercussions for women, including social stigma, divorce, or physical violence. Women in these circumstances are dependent on men for their survival and that of their children. As one participant commented, "A wife is just for the kitchen, you are nothing." For these reasons, participants explained that some women may have good reasons to hide their secrets of infidelity or rape, a common occurrence during war. Other reasons included fear of violence, stigma, expulsion from the community, and fear that the illegitimate child would be rejected by her husband.

Throughout the interviews participants spoke about the meaning of family. Most participants thought of the family as an entity that has deep biological roots tying people to each other. They described children as being an extension of their lives into the future. At the same time, however, they talked about the plasticity of family, meaning that the identity of family members, especially children, is not necessarily always determined by biology. "If you raise a child with no family, that's your family too, even though it's not your son or even though he's not related at all to you, but you raised him from the beginning so that's your son, no matter what, that's how we call family."

Participants talked about how disruptions such as war, poverty, and disease can lead to family relationships that cannot be verified through genetics or legalized through formal adoption procedures that characterize Western societies. Although biology is important, participants described family roles and belongingness as being shaped by the sharing of a life together. Often, if a non-biological child is raised by a family, that child is accepted and integrated into the family the same as biological children.

IV. DISCUSSION

The use of genetic testing in immigration may offer the potential benefits of reducing and preventing fraud and improving the efficacy and accessibility of the reunification process. Depending on how genetic testing is implemented, however, a range of potential harms can arise. The best implementation, therefore, is one that seeks to gain all of the benefits while mitigating potential harms for immigrant families who are legitimately trying to reunify. The purpose of this study was to understand the test's benefits and impacts through the first-hand experiences of families.

Genetic testing can be a useful means to prove a claim to a family relationship and achieve reunification. However, some aspects of testing can

cause concerns and hardships for families. Families in this study often felt anxious and uncertain about the testing process in light of the paucity of information at their disposal. Most participants did not know what DNA testing was when immigration officers suggested it. The participants were not given any information to help them understand the test, the testing process, or the risks and benefits associated with the choice of testing. Also, most participants did not understand that taking the test is a voluntary decision, as emphasized in the DNA testing policy.⁸⁰ Some felt testing was their last hope, that they had no choice, and complied without understanding the possible implications of their decisions. Indeed, in many cases, DNA-based evidence was the only likely chance of success for the applicant, so, despite technically being voluntary, the petitioner viewed testing as mandatory. The cost of the test and the time it took to process it also surfaced as important issues that were anticipated by Taitz et al.⁸¹

Disclosure of test results, especially to children, was a sensitive issue that participants had to grapple with. The impact of disclosing results to children has been an ethical concern argued in the literature. As Taitz et al. note, “The most important consideration in regard to DNA testing in any context is its potential to irreparably disrupt a family unit. The impact on children after learning that they are not biologically members of their families is most likely devastating.”⁸² Cases in this study support this concern. Family members who obtained negative test results took the test without any prior knowledge of misattributed paternity or missing biological ties. The negative results of their tests challenged the trust between petitioners and beneficiaries and the way familial ties were understood and defined. The rupture in their knowledge of self and family caused significant stress. Having to discuss the results with their beneficiaries was painful and had serious consequences for children.

Furthermore, revelations of misattributed paternity and adoption were damaging to children who could not understand why their parents were telling them that they were not biologically related to them. In one case, children asserted their connections to the petitioner by telling her that she was lying. Their “narrative identity” in the family was challenged.⁸³ Nordgren defines narrative identity as an identity constructed by the family and the community that answers the question, “Who am I?”⁸⁴ These children had been raised being told they were the children of the petitioner. The community asserted the narrative, but the DNA told another story. Changing that narrative can be

80. Cronin Memorandum, *supra* note 7; *see also* FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(c).

81. Taitz, Weekers & Mosca, *The Last Report*, *supra* note 10.

82. *Id.* at 27; *see also* Villiers, *supra* note 10.

83. Anders Nordgren, *Genetics and Identity*, 11 COMMUNITY GENETICS 252, 253 (2008).

84. *Id.*

confusing and painful for the child.⁸⁵ Beneficiaries, especially children, had to cope with the reaction of the community and their friends, as in some cases, the DNA test results changed their attitudes and behaviors towards the beneficiaries.

In addition, prior research has shown that upon discovering misattributed paternity, fathers may choose to relinquish their ties with their children and financially abandon the family.⁸⁶ Although participants in this study did not make that decision, one participant seriously considered it. Even if relationships between the petitioner and beneficiary do not end after disclosure, family members must still “cope with a child in the family structure who is related to only one parent and sometimes the results of infidelity.”⁸⁷

V. RECOMMENDATIONS

DNA testing in family reunification-based immigration proceedings can provide benefits to immigrant families going through the process. But it can also create potential negative effects and reveal unexpected information that may hamper those benefits and damage the integrity of a family. These potential harms could be mitigated through improvements in the implementation of testing in the reunification process. Based on the information gathered in this study, we offer the following recommendations as ways to reduce the potential negative consequences of DNA testing while maintaining its benefits.

A. *Provide Information About DNA Testing at the Beginning of the Immigration Process*

Currently, USCIS does not provide readily accessible information about the test, the testing process, the reasons for testing, the possibility of the results negating genetic relatedness, the way the results will be returned, or whom to go to if counseling is necessary. The U.S. Department of State presently has a webpage that explains DNA relationship testing, but the website is not easily accessible nor does it clearly explain DNA and the risks and benefits of testing.⁸⁸ It is written more for an audience of lawyers rather than for petitioners and beneficiaries. Consequently, as seen in this study, petitioners may not be

85. Diana Scott-Jones, *Paternity Testing Family Relationships and Child Well-Being*; in GENETIC TIES AND THE FAMILY: IMPACT OF PATERNITY TESTING ON PARENTS AND CHILDREN 50-70 (Mark A. Rothstein et al. eds., 2005).

86. Michael Grossberg, *Duped Dads and Discarded Children: A Historical Perspective on DNA Testing in Child Custody Cases*, in GENETIC TIES AND THE FAMILY, *supra* note 85, at 97.

87. Mark A. Bellis et al., *Measuring Paternal Discrepancy and its Public Health Consequences*, 159 J. EPIDEMIOLOGY & COMMUNITY HEALTH 749, 752 (2005).

88. BUREAU OF CONSULAR AFFAIRS, U.S. DEPARTMENT OF STATE, U.S. VISAS: DNA RELATIONSHIP TESTING PROCEDURES (2014).

able to make fully informed decisions when they agree to the DNA test. Therefore, we recommend that USCIS and the State Department develop an information sheet and disseminate it widely (e.g., as a pamphlet or a more accessible section on their website) and make it part of the standard information package given to immigrants at the beginning of the family reunification process. Immigration lawyers should also disseminate this information as a matter of standard practice during their initial consultation with clients.

Supplying written material, such as a pamphlet or website, which provide this information would allow petitioners to be aware that DNA testing may become an evidentiary option if documentary evidence is missing or deemed insufficient to establish the alleged family relationship. Testing information can be provided as a pamphlet, which could be translated into different languages. Such a pamphlet has been developed by the New Zealand Immigration Service (NZIS) that talks about what DNA is, explains the process of the testing, and the fact that it is voluntary.⁸⁹ In addition, the NZIS pamphlet is part of the consent form that reads, “If you have read and understood the information in this leaflet, and wish to give a sample of your DNA for testing, sign the declaration contained in the accompanying letter.”⁹⁰

The new USCIS information materials should provide the same level of detail about DNA testing as would be included in medical informed consent.⁹¹ This information should include specific language about when tests are suggested (i.e., in the absence of documentation), details about the cost and time associated with getting the tests and results, and advice to seek counsel with a lawyer or advocacy agency, as the results can sometimes identify surprising information that can undermine the application. There should be an explanation of how results are interpreted and that, even if results support the biological relationship, other factors may play a role in determining whether the application is approved.⁹² Providing this information to petitioners should help them make an informed decision when choosing whether to pursue a DNA test. It may also help them prepare for the consequences of unexpected results from such tests. All of this information should be provided by USCIS to petitioners as early as possible in the process, regardless of whether testing will be necessary.

In addition, because not all petitioners may be literate or have access to the internet or immigration lawyers, it would be useful to provide a telephone number that petitioners could call to receive information about the test and ask

89. IMMIGRATION NEW ZEALAND, DNA TESTING: INFORMATION FOR APPLICANTS (2010), available at <http://www.immigration.govt.nz/NR/rdonlyres/91824E10-B285-4F5E-9387-9CACE4D3E760/0/1108.pdf>.

90. *Id.* at 3.

91. See, e.g., Stuart Cable et al., *Informed Consent*, 18 NURSING STANDARD 47 (2003); Lesley Goldsmith et al., *Genetics: Advocating for the Rights of All Individuals to Informed Decision Making and Voluntary Action*, 28 NURSING STANDARD 37 (2013).

92. See FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N3(c).

questions about it. Non-profit organizations that provide immigration legal counseling may be a good avenue to help provide these services.

B. Emphasize the Voluntary Nature of DNA Testing

The DNA testing policy clearly states that DNA testing is voluntary.⁹³ However, petitioners in this study did not always understand the test as voluntary. They sometimes perceived it as another requirement that would enable the processing and acceptance of their petitions. This misunderstanding caused problems, especially when test results did not provide evidence of a biological relationship. Therefore, it is important that USCIS place more emphasis on communicating the voluntariness of the test in order to reduce sources of misunderstanding. Voluntariness not only refers to having the free will to make a choice, but also having the necessary information to be able to make an informed decision. Providing the information discussed in Part IV. B would assist in this.

Additionally, we recommend that USCIS adopt a procedure that when a DNA test is suggested, information about the voluntariness of the test, as well as information about other possible means of recourse (such as appealing to the BIA or pursuing adoption) is provided in case the petitioner does not elect to take the test. Otherwise, petitioners may view DNA testing as the only option they have to help their case, even when other options may be available.

C. Educate Immigration Lawyers about DNA Testing

Immigration lawyers must be prepared to answer questions about DNA testing and help guide their clients with a testing decision. Explaining the implications of DNA-based testing is often complex. In the clinical setting, protocols and strategies have been developed to support individuals facing testing decisions. Genetic counseling experts or researchers partnering with the American Immigration Lawyers Association could potentially modify these strategies. These protocols can then be disseminated to immigration lawyers through continuing legal education (CLE) programs. In addition to this information, other topics that need to be addressed in CLE include raising lawyers' awareness about other cultures' conceptions of family relationships. This includes understanding that families may informally adopt children and not share this information because of their cultural beliefs and values. Clients may use the word "children" to refer to both their biological children and their adopted children, especially in countries that do not have formal adoption practices or where disclosing adoptions is socially unacceptable.

The outcome of the training should be that lawyers are able to explain to their clients the possibility that USCIS or the State Department could suggest DNA testing, especially in the absence of documents. In addition, lawyers

93. *See id.*; *see also* Cronin Memorandum, *supra* note 7.

should be able to explain, in a simple way, what DNA is, how the DNA testing process works, and the possibility that the test could reveal sensitive information, which may undermine, rather than advance, their case. Lawyers should therefore ask their clients about non-disclosed or informal adoptions or possibilities of non-paternity. They should also provide information about other options should the client elect not to proceed with the DNA test. By speaking with their clients and making sure they understand what DNA testing is, immigration lawyers can better assess whether the testing will be appropriate for their clients.

D. Make the DNA Test More Affordable to Families and Improve its Processing Time

The potential costs and associated burdens involved in DNA testing have been addressed in the literature⁹⁴ and were experienced by the majority of participants in this study, especially when the test was an extra, unexpected expense that was incurred late in the process. These burdens represent another reason why USCIS should provide information about the DNA test and its associated costs to petitioners at the beginning of the process, so petitioners can plan for these potential expenses. One option to make testing more affordable would be for laboratories or USCIS to sponsor monthly payment plans that would allow petitioners to pay the cost over a fixed period of a year or two. If the petitioner does not follow through with the payment plan, he or she would be required to pay the balance on the account in full or risk revocation of the beneficiary's legal permanent residency status.

The amount of time laboratories take to process the DNA samples was also an issue, with some families in our study reporting a wait of three months or more before obtaining the DNA results. Most of the time, the delay occurred when the laboratory sent the DNA test kit to the U.S. embassy and had to wait for it to be sent back for analysis. Some of these delays may be unavoidable, especially when they are due to the time and expense required for the beneficiary to travel to a U.S. embassy. However, other delays result from a lack of coordination between the laboratories and the U.S. embassies around the world. In cases where these delays are no fault of the petitioners, yet they threaten the progress of the application, USCIS should grant petitioners extensions free of charge.

The laboratories collaborating with USCIS may consider setting up better communication systems that facilitate more efficient exchanges of the test kits and samples between the labs and embassies. This system should include a way for petitioners to track the process via a website or the phone. This could help them avoid unnecessary stress, increase petitioners' capacity to problem-solve issues related to the beneficiary's responsibilities to provide a sample, and obviate the need to engage lab personnel in providing progress reports.

94. See Taitz et al., *supra* note 81; Villiers, *supra* note 10.

E. *Explain Test Results in Accessible Language*

Most laboratories send DNA test results to petitioners by mail, using scientific language to convey the findings. This language can be confusing for petitioners who are not familiar with technical terms used to report the results, such as probability, allele, and kinship analysis terms. For example, the following language is used by one of the approved labs to explain results:

We have completed a kinship analysis on samples from the individuals listed below. Based on the scientific evidence we conclude that Jules Rondend cannot be excluded as the biological mother of James Rondend. The observed combination of genetic markers of the involved parties is 98,000 times more characteristic of maternity by Jules Rondend than of maternity by an untested, unrelated Caucasian woman. The probability of the stated outcome, assuming a 50% prior chance is 99.99888%.⁹⁵

Although it may be important for laboratories to provide the above information to immigration officers to inform their decisions, the technical wording and content may be confusing and frustrating for petitioners to read. Language such as “cannot be excluded as the biological mother” does not provide a simple answer to the central question for petitioners and beneficiaries: does the test show that we are related, or not? Studies have shown that a significant portion of the U.S. population cannot understand probabilities or are not comfortable interpreting their meaning.⁹⁶ This is particularly the case for many petitioners who come from different cultural and socioeconomic backgrounds, were taught by different educational systems, and have different abilities to read and understand English. USCIS should establish standards for laboratories to provide a clear and simple written summary of test results. This may prevent misunderstandings and will make the test results more accessible for the petitioners.

F. *Protect the Privacy and Confidentiality of Petitioners and Beneficiaries*

Genetic privacy is the right of individuals, families and communities to protect their genetic information from being disclosed to the public or used for other purposes.⁹⁷ Limited privacy controls seem to be in place in the DNA testing process for family reunification.⁹⁸ As Villiers notes, there needs to be “[m]ore oversight of the DNA testing companies and stronger policies regarding quality assurance and privacy. . . . Although the economic efficiency

95. *How to Read a Paternity Testing Report*, GENELEX (July 14, 2012), <http://www.healthanddna.com>.

96. Wendy Nelson et al., *Clinical Implications of Numeracy: Theory and Practice*, 35 ANN. BEHAV. MEDIC. 261 (2008); NAT’L CENT. FOR EDUC. STATS., A FIRST LOOK AT THE LITERACY OF AMERICA’S ADULTS IN THE 21ST CENTURY (2005).

97. Jeantine E. Lunshof et al., *From Genetic Privacy to Open Consent*, 9 NAT. REV. GENETICS 40611 (2008).

98. FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N10(b)(1).

and administrative ease of DNA testing may lull us into complacency, the potential for its abuse is substantial and, once released, the DNA genie cannot be put back in the bottle.”⁹⁹

Securing the privacy of petitioners’ DNA information is very important; DNA conveys information not only about family relationships but also about “the regions that they are from; sometimes you can get health data on people.”¹⁰⁰ Therefore, we recommend that USCIS and participating laboratories provide information to petitioners about the measures they take to protect their privacy. This information could be included as part of the DNA testing pamphlet or website discussed in the first recommendation.¹⁰¹

Privacy can also be compromised when information is leaked to the communities where the beneficiaries live, as occurred in one case. Information is usually shared by petitioners, beneficiaries, or other family members who might not grasp the sensitive and personal nature of the information that they are divulging. As happened to participants in this study, revealing this information may have serious consequences later, particularly if the DNA test results show a lack of biological relationship. It is our recommendation that petitioners and beneficiaries be advised by USCIS, lawyers, and other non-profit groups that work with these individuals about the measures they should take to protect their privacy.

As shown in this study, children are particularly vulnerable and may suffer the most when misattributed parentage or adoption is revealed as a result of DNA testing. They may become confused, scared, and depressed when learning unexpected genetic information about their biological relationships with their parents or family members. In cases of misattributed paternity, they may have to endure the response of the community, the father, and the father’s family members. They also risk losing the recognition and financial help of the petitioner and thus may need to remain in the country of origin with only one parent or no parent at all. As a consequence, it is most important to safeguard the vulnerability of children against the disclosure of sensitive information and the consequences such disclosure might bring to them. Although this may sometimes be difficult because of the nature of the immigration process, it might be possible to put some safeguards in place.

A potential safeguard would be to provide information to petitioners about the impact testing can have on children if it reveals secrets of misattributed

99. Villiers, *supra* note 10, 270-71.

100. Sahli, *supra* note 7; *see also* Villiers, *supra* note 10, at 253.

101. For example, the Immigration New Zealand pamphlet referred to in the first recommendation includes the following privacy information: “DNA samples will only be used by INZ to test biological relationships for immigration purposes. All materials associated with the test (i.e., samples and paperwork) will be destroyed after the following periods: Paperwork at the sampling clinics—three months; Samples at the DNA testing laboratory—24 months; Paperwork at the DNA testing laboratory—24 months; Computer records at the DNA laboratory—24 months.” *See* IMMIGRATION NEW ZEALAND, *supra* note 89, at 3.

paternity or adoption. Family and immigration lawyers need improved guidance on how best to disclose this information in a way that children can grasp, without feeling scared, rejected or afraid that their relationship with the petitioner has changed. Having this information also gives petitioners the opportunity to prepare and plan with their spouses and other family members regarding how they will approach non-disclosure or disclosure.

G. *Provide Avenues of Support to Cope with Unexpected DNA Test Results*

When DNA test results reveal sensitive information, such as misattributed paternity, our study revealed that usually petitioners did not have adequate resources to effectively cope with the unexpected information. They did not know how to convey such information to their beneficiaries, especially if beneficiaries were children. This caused anxiety and depression and in one case even affected the ability of one participant to go to work. Participants often did not know to whom to turn for questions and guidance. Providing petitioners with ideas about where to get support is necessary to help mitigate some of these consequences.¹⁰² For example, petitioners may be referred to community organizations, non-profit organizations, or support groups that provide services to help people cope with life changes. Many of these groups provide free services. Also, there are online websites such as HelpGuide, which provide guidance on how to recognize and overcome depression, how to accept and mend broken relationships, and how to cope with the process of grieving to start healing.¹⁰³ Moreover, there are crisis hotlines that are free of charge and provide quick access to temporary support.¹⁰⁴ Since many petitioners may not yet understand the U.S. culture or what services are at their disposal in the community, providing a guide to available services may be helpful. We recommend that USCIS provide this information as part of the standard immigration information package. Further, non-profits and immigration lawyers should provide information about specific local resources.

102. Taitz, Weekers & Mosca, *DNA and Immigration*, *supra* note 10.

103. *Coping with Grief and Loss: Understanding the Grieving Process*, HELPGUIDE.ORG, <http://www.helpguide.org/articles/grief-loss/coping-with-grief-and-loss.htm> (last visited Feb. 15, 2014).

104. Each state provides crisis hotlines and different services for immigrants. One hotline that is nationwide is 24-Hour Crisis Line, founded in Alameda County “on the humanistic idea that skilled intervention by non-professionals can help people in emotional crisis.” 24-HOUR CRISIS LINE, http://www.crisissupport.org/crisis_line (last visited Apr. 4, 2015). They can be reached at 1-800-273-8255. Another example is the Intercultural Counseling Connection, a Resource for Refugees in the Greater Baltimore Area, which provides different resources for refugees including coping programs. See *Maryland Resources for Refugees, Asylees, Asylum-seekers and Immigrants*, INTERCULTURAL COUNSELING CONNECTION, <http://www.interculturalcounseling.org/community-resources> (last visited Apr. 4, 2015).

Other countries have taken this approach. For example, the Australian Government's Department of Immigration and Citizenship has a section about counseling in their form 1259i which explains DNA and the DNA testing process to petitioners. It uses simple language to inform petitioners where they may go for counseling if the need arises:

You can seek counseling (advice) from a health professional or Panel doctor before you decide to do DNA testing. You can also seek counseling after the DNA test results are known. **Note:** You will be responsible for paying for any counseling you undertake.¹⁰⁵

H. *Accept Alternative Means of Establishing Relationships*

The current definition of family for immigration purposes relies on assessing the presence of biological ties or formal, state-recognized unions and adoptions.¹⁰⁶ It also requires proof of an existing bona fide relationship.¹⁰⁷ While DNA results can reveal fraudulent or false claims of biological family relationships, it is also possible that in some cases petitioners make familial claims in good faith and only through testing discover the absence of alleged biological ties. This was the case for a family in our study. When an alleged parent has intentionally acted as the caregiver of a child for all of his or her life, denying that relationship because the DNA disproves parentage harms both the child and the family, which goes against the aim of the family reunification policy.¹⁰⁸

In these cases, when beneficiaries are children under age sixteen, adoption is an option that enables reunification.¹⁰⁹ However, there are several cases where a legal adoption may not be possible. For example, international adoption of children over age sixteen is not allowed by law,¹¹⁰ unless there are younger siblings of the beneficiary who are also being adopted, in which case an exception is made.¹¹¹ Additionally, some countries, such as Syria, do not recognize or allow adoptions of children.¹¹² Other factors, such as political instability or a lack of government in the home country, may also prevent

105. AUSTRALIAN GOVERNMENT DEP'T OF IMMIGRATION AND BORDER PROTECTION, INFORMATION ABOUT DNA TESTING FOR VISA AND CITIZENSHIP APPLICANTS, FORM 1259I 1 (2014), available at <http://www.immi.gov.au/forms/Documents/1259i.pdf>.

106. See Immigration and Nationality Act, Pub. L. No. 82-414, § 101(b)(1), 66 Stat. 163, 171 (1952) (codified as amended at 8 U.S.C. § 1101 (2014)).

107. See 8 C.F.R. § 204.2(d) (2015).

108. See Villiers, *supra* note 10, at 263; Taitz, Weekers, and Mosca, *The Last Report*, *supra* note 10, at 27; Murdock, *supra* note 10, at 1503-34.

109. See Immigration and Nationality Act, Pub. L. No. 82-414, § 101(b)(1)(E), 66 Stat. 163, 171 (1952) (codified as amended at 8 U.S.C. § 1101 (2014)).

110. *Id.*

111. See Immigration and Nationality Act, Pub. L. No. 82-414, § 101(b)(1)(F), 66 Stat. 163, 171 (1952) (codified as amended at 8 U.S.C. § 1101 (2014)).

112. *Information on International Adoptions*, EMBASSY OF THE UNITED STATES, <http://damascus.usembassy.gov/service/adoption.html> (last visited Dec. 31, 2014).

adoption. In these cases, family members may not even be able to return to their countries to see their children or to live with them.

In such cases where there is no biological relationship and no viable option for adoption, we recommend providing other means of assessing whether a de facto parent-child relationship exists and allowing immigration based on that relationship. In a de facto relationship, the parent holds out the child as his own, has supported the child long-term, and is regarded as the parent by the child.¹¹³ Such relationships have already been recognized in U.S. family law.¹¹⁴

The existence of a de facto relationship would have to be proven. In order to have adequate safeguards against fraud and human trafficking, the burden of proof would have to be high. Villiers has suggested a procedure similar to the Stokes interviews, which are conducted by USCIS to identify sham marriages between U.S. citizens and their spouses.¹¹⁵ During these interviews the alleged husband and wife are questioned separately about their lives together. Strong inconsistencies between interview responses may suggest that there has not been a true marital relationship between the couple and that the marriage may have been contrived for immigration purposes. Villiers writes, “Similarly, in family-based cases when the DNA results are inconclusive or show no familial relationship and the parties make an equitable claim of social fatherhood, procedures like the Stokes interview could be implemented to combat fraud and yet allow for a more thorough determination of the case.”¹¹⁶

Additionally, it is important to note that when test results show unexpected low parentage probabilities, and petitioners are sure of the relationship, they may consider repeating the test. When all procedures are followed, DNA testing for parentage is typically highly accurate and reliable.¹¹⁷ However, there are factors that can influence the accuracy of the test, as the policy itself states.¹¹⁸ For example, during the recruitment of our small sample, one family reported receiving a DNA test result that failed to demonstrate a biological relationship. The test was repeated and proved that the first set of results were wrong. Although cases like this are likely rare, laboratory mistakes and testing errors do occur. To illustrate this point, in 2008, parentage testing laboratories

113. Such de facto parent-child relationships have already been recognized in U.S. family law. For example, in California, the court determined that a man who had functioned as the father of a child left behind by a former girlfriend could be recognized as the legal father, given that he had considered the child as his own, supported the child for many years and the child saw him as his father. *In re Nicholas H.*, 46 P.3d 932 (2002).

114. *See id.*

115. *See Villiers, supra* note 10, at 270-71; *see also* Malachovsky Law Offices P.C., *What to Expect at the Stokes Interview*, STATUS IMMIGR., <http://www.statusimmigration.com/StokesInterview.html> (last visited Apr. 5, 2015).

116. *See Villiers, supra* note 10, at 270.

117. *See* 9 FOREIGN AFFAIRS MANUAL, *supra* note 24, § 42.44 N1(a).

118. *See* Cronin Memorandum, *supra* note 7.

in Europe reported an error rate of 0.08% in calculating paternity.¹¹⁹ This rate was lower compared to previous years. For example, in 2005, the error rate was reported to be 0.30%.¹²⁰ The error rate included errors in genotyping, clerical, and nomenclature errors.¹²¹

I. *Implementation and Costs of Recommendations*

Table 4 highlights, for each recommendation, the agents who would be involved in and responsible for making these changes, as well as the types of costs and potential benefits associated with each one. Implementing these recommendations requires the participation of multiple stakeholders: the government and immigration officers providing access to the necessary information at the beginning of the immigration process, lawyers learning the details of the test and their potential impact to properly inform their clients, and labs more effectively communicating information about the test to petitioners.

In general terms, the types of costs required to implement these recommendations include: information development and dissemination; continuing professional education; and costs associated with obtaining and processing samples and receiving results. The government would likely bear the majority of the information development and dissemination costs. For example, there will be fixed costs associated with developing, distributing and updating pamphlets and/or websites. In this case, these costs would be borne by the federal government or by a partnership between the federal government and nonprofit advocacy organizations. However, the government is already responsible for providing information, so this cost could be included as part of the existing costs associated with keeping information about immigration processes up-to-date. Lawyers would be responsible for the costs of their continuing education, but this too is an expected cost of business. Lab and potential counseling costs are currently borne primarily by petitioners. Our recommendations for developing financing mechanisms would shift some of the burden of these costs to the government and laboratories, who may simply roll the cost into existing application fees, thus passing the costs along to petitioners.

Although the costs incurred for implementing these recommendations need to be examined in detail, they offer potential benefits for immigrants, the government, and immigration lawyers. They aim to mitigate the risks to immigrants' well-being associated with DNA testing and provide clear information about the test, as well as a testing process that is transparent,

119. Anni Rønfeldt Thomsen et al., *A Report of the 2002-2008 Paternity Testing Workshops of the English Speaking Working Group of the International Society for Forensic Genetics*, 3 FORENSIC SCI. GENETICS 214, 214-21 (2008).

120. *Id.*

121. Error rates and other statistics for DNA-based tests used in family reunification are not reported to USCIS or in public sources and may vary between different laboratories. See Prakash Recommendation, *supra* note 7.

efficient, and accessible. Family reunification immigration policy recognizes that “psychologically and socially, the reunion of family members with their close relatives promotes the health and welfare of the United States.”¹²² Taking steps to reduce the unintended consequences associated with DNA testing maximizes the health and welfare of petitioners and supports the intent of the family reunification provision. Likewise, as immigration lawyers’ primary goal is to best serve their clients, adopting these recommendations will enable them to help their clients determine whether DNA testing, particularly the potential social costs of misattributed parentage and the disclosure of sensitive information, will support or harm their case.

122. U.S. DEP’T OF EDUC., SELECT COMM’N ON IMMIGRATION & REFUGEE POLICY, U.S. IMMIGRATION POLICY AND THE NATIONAL INTEREST: THE FINAL REPORT AND RECOMMENDATIONS OF THE SELECT COMMISSION ON IMMIGRATION AND REFUGEE POLICY WITH SUPPLEMENTAL VIEWS BY COMMISSIONERS, ED-211-612 (1981).

Table 4: Summary of Actions, Agents and Costs for Recommendations Discussed Above

Recommendations	Actions	Agents	Costs	Benefits
<i>1. Provide information about testing at the beginning of the immigration process</i>	<ul style="list-style-type: none"> • Educational pamphlet • Website • Develop process to disseminate information • Help-line for questions 	<ul style="list-style-type: none"> • USCIS • Lawyers • Non-profit organizations 	<ul style="list-style-type: none"> • Fixed costs for developing, distributing, updating pamphlet and website 	<ul style="list-style-type: none"> • Informed decision making • Informed consent
<i>2. Emphasize the voluntary nature of DNA testing</i>	<ul style="list-style-type: none"> • Indicate voluntary nature of test • Provide information about other recourses 	<ul style="list-style-type: none"> • USCIS 	<ul style="list-style-type: none"> • May not be a substantial incremental cost if coupled with recommendation #1 	<ul style="list-style-type: none"> • Reduce sources of misunderstanding • Informed decision • Understanding options
<i>3. Educate immigration lawyers about DNA testing</i>	<ul style="list-style-type: none"> • Develop protocols and strategies for lawyers to support their clients make DNA testing decisions • Provide training on this topic for lawyers 	<ul style="list-style-type: none"> • Genetic counseling experts • Researchers • American Immigration Lawyers Association 	<ul style="list-style-type: none"> • Fixed cost for developing guidelines and protocols in consultation with genetic counselors or researchers • Developing and distributing protocols • Cost for training borne by immigration lawyers 	<ul style="list-style-type: none"> • Ability to explain DNA testing to clients: how the process works, the information that testing may reveal • Prepared to ask the appropriate questions regarding family relationships • Better assess whether testing is appropriate for clients.

Recommendations	Actions	Agents	Costs	Benefits
4. <i>Make testing more affordable and improve its processing time</i>	<ul style="list-style-type: none"> • Provide information about cost and time for testing • Implement monthly payment plans for immigrants that cannot afford testing • Implement better system to coordinate communication and delivery of testing kits between laboratories and embassies • Set up tracking system 	<ul style="list-style-type: none"> • USCIS; • Laboratories 	<ul style="list-style-type: none"> • Information to be included with materials developed for recommendation #1 • Costs for developing monitoring systems would be borne by labs and government • Implementing these changes would need to be assessed and measured against the benefits 	<ul style="list-style-type: none"> • Enable petitioners to plan for possible expenses • Increases access to DNA testing potentially allowing the resolution of some immigration cases • Improves the system for testing, decreasing amount of time immigration officials and family members wait for the results • Makes the testing process more effective and efficient
5. <i>Explain test results in accessible language</i>	<ul style="list-style-type: none"> • Set standards for laboratories to provide simple and clear results for immigrants 	<ul style="list-style-type: none"> • USCIS • Laboratories 	<ul style="list-style-type: none"> • Overhead cost for laboratories to meet standards • Cost may be passed to immigrants 	<ul style="list-style-type: none"> • Preventing misunderstandings • Making test results more accessible • Decrease time laboratories may take explaining test results
6. <i>Protect the privacy and confidentiality of petitioners and beneficiaries</i>	<ul style="list-style-type: none"> • Provide information about privacy measures taken • Advise discretion when waiting for DNA test results • Provide guidelines to 	<ul style="list-style-type: none"> • USCIS • Immigration lawyers • Non-profit organizations 	<ul style="list-style-type: none"> • If coupled with recommendation #1, small incremental cost • Cost for preparing and distributing guidelines would have to 	<ul style="list-style-type: none"> • Build trust • Prevents potential negative consequences as a result of revealing DNA test results • Protects children from these

Recommendations	Actions	Agents	Costs	Benefits
	help petitioners disclose DNA testing information to children		be assessed by each organization	consequences <ul style="list-style-type: none"> Disclose information to children in a way that prevents or ameliorates confusion and fear
<i>7. Provide avenues of support to cope with unexpected test results</i>	<ul style="list-style-type: none"> Provide information about resources (community groups, support groups, websites, etc.) that provide services (especially free of charge) to help people cope with life changes 	<ul style="list-style-type: none"> USCIS Lawyers 	<ul style="list-style-type: none"> If coupled with recommendation #1, it could be a minimal additional cost. 	<ul style="list-style-type: none"> Help petitioners/beneficiaries cope with unexpected life-changing information Provide external support to ameliorate anxiety, depression, and anger, and prevent a rupture of relationships especially with children
<i>8. Accept alternative means of establishing relationships</i>	<ul style="list-style-type: none"> Implement system like Stokes interview to assess bona fide relationship in cases where misattributed paternity is revealed Repeat DNA test if there is uncertainty about test results 	<ul style="list-style-type: none"> USCIS Laboratories 	<ul style="list-style-type: none"> Cost for implementing Stokes-like procedure should be studied Cost of repeating DNA test is borne by petitioner depending on the case 	<ul style="list-style-type: none"> Provides alternative avenue for families who have discovered misattributed paternity to reunify

VI. STUDY LIMITATIONS

This study identified common and unique experiences across a group of petitioners who have had a genetic test, most of whom came as refugees from African countries. We cannot say how their experiences might relate to or differ from individuals who come under other immigration categories or from other parts of the world. In addition, the views and knowledge of participants regarding this topic may have differed depending on how long they have lived in the United States.

We acknowledge that study recruitment was very difficult, which could suggest that DNA testing in immigration is still a new practice or one that is being used only in the specific cases represented here. It might also be that individuals are reluctant to talk about their experiences with testing because they consider them private. In addition, language was a barrier for recruitment. Some individuals could not participate in the study because they did not speak English or Spanish, the only two languages in which interviews were conducted. The use of translators and interpreters was not possible due to limited funding.

Lastly, this study included only the perspectives of petitioners. It did not include the perspectives and experiences of other stakeholders, such as beneficiaries, USCIS and State Department immigration officials, and immigration lawyers. In preparing for the project, we reviewed the literature to understand the context of DNA testing and also conducted informal, informational interviews with three USCIS agents and several of the lawyers who served as intermediaries. Because these individuals did not consent to the study, their information is not specifically cited.

CONCLUSION

DNA testing has been made available as a supplementary tool to prove biological familial relationships in the family petitioning process for immigration cases where document-based evidence is unavailable or inadequate. The use of DNA allows USCIS to determine scientifically whether a biological relationship exists between a petitioner and a beneficiary, reducing the possibility of immigration fraud, and making the process more efficient and accessible for immigrants without documentation. However, as with many emerging uses of genetic technologies, the full scope of the impacts, both positive and negative, that such testing could have on those undergoing testing is not fully understood.

This research reports the perspectives of individuals and families who have been through testing to inform policy related to the use of genetic testing in immigration. Our findings highlight the benefits and problems that genetic testing can create for immigrant families. Currently, it is difficult to estimate what proportion of low probability results are due to intentional fraud versus a

lack of knowledge or other understandings of familial and biological relationships. Some low probability results might derive from misunderstanding on the part of petitioners or other family members about the methodology of genetic testing and its relation to biologically-based family ties. Solutions that make this process more transparent for families will also serve the goal of reducing fraud.