The Privacy, Probability, and Political Pitfalls of Universal DNA Collection

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I. INTRODUCTION

Watson and Crick’s discovery of the structure of DNA (deoxyribonucleic acid) in 19531 launched a truth-finding mission not only in science but also in the law. Just thirty years later—after the science had evolved—DNA evidence was being introduced in criminal courts.2 Today, DNA evidence is heavily relied on in criminal and related cases.3 It is rou-

* Gerald J. Ford Research Fellow and Associate Professor of Law, Southern Methodist University Dedman School of Law. I thank Arnold Loewy for initiating a debate on this topic and Editor-in-Chief Evan Atkinson for inviting me to contribute this piece to the SMU Science & Technology Law Review. This short essay is based on remarks I made in debating Professor Arnold Loewy on the Universal Collection of DNA at an event hosted by the SMU Criminal Law Society in October 2015.


3. See Calandro, supra note 2; Ryan, supra note 2, at 427–28; see also Maryland v. King, 133 S. Ct. 1958, 1966 (2013) (stating that “[t]he advent of DNA technology is one of the most significant scientific advancements of our era” and
tinely introduced in murder and rape cases as evidence of guilt;\(^4\) DNA databases have grown as even arrestees have been required to surrender DNA samples;\(^5\) and this evidence has been used to exonerate hundreds of convicted individuals.\(^6\) DNA evidence is generally revered as the “gold standard” in criminal cases\(^7\) because, unlike eyewitness testimony, bite-mark evidence, hair analysis, and the like, it is considered nearly infallible.\(^8\) This potency of DNA evidence has led to suggestions that we, as a nation, should

that “the utility of DNA identification in the criminal justice system is already undisputed”).


5. See King, 133 S. Ct. at 1980 (upholding the practice of taking a DNA sample from an arrestee—using a buccal swab—during a “routine booking procedure”).


7. Donald E. Shelton, Forensic Science Evidence: Can the Law Keep Up with Science? 190 (2012); Michael Lynch, God’s Signature: DNA Profiling, the New Gold Standard in Forensic Science, 27 Endeavor 93, 93–94, 96–97 (2003); see Nat’l Acad. Sci., supra note 4, at 130 (“Although the forensic use of nuclear DNA is barely 20 years old, DNA typing is now universally recognized as the standard against which many other forensic individualization techniques are judged.”).

magnify the power of DNA by increasing the size of DNA databases. Several of these proposals have gone so far as to propose that we should collect DNA from every single American—that there should be universal collection of DNA.

This article explains that, while the universal collection of DNA may be alluring, it imposes greater privacy burdens than typically suggested and may be less useful than one might imagine. Depending on whether individuals’ DNA profiles or samples are stored, and how they are analyzed, this may potentially provide the government—and other actors—with an unprecedented amount of private information about ordinary Americans. Further, because we live in a system with limited resources, investing in the universal collection of DNA will likely result in scaling down law enforcement resources elsewhere, such as by reducing the number of professional crime scene investigators or police officers on the street. These accompanying events will likely detract from any anticipated increase in crime-solving resulting from the universal collection of DNA and will likely overcome any progress made on that front.

II. THE ARGUMENT FOR UNIVERSAL COLLECTION OF DNA

Arguments in support of the universal collection of DNA generally emerge out of the confidence in truth-finding that DNA evidence inspires.


10. By employing the term “American,” I do not necessarily mean to exclude foreigners on American soil. The proposals generally do not detail who exactly would be swept up in the universal collection of DNA.

11. See supra note 9.

12. See, e.g., Roth, supra note 9, at 295, 308–09 (explaining that “the DNA revolution has transformed crime-solving” and that “[a] universal citizen database . . . would promise impressive clearance rates for unsolved rapes and homicides involving DNA”); Posner, supra note 9 (stating that “DNA testing provides a uniquely valuable approach to this difficult problem” of unsolved crimes like
Indeed, DNA evidence is broadly considered the "gold standard" of forensic science. As a report by the National Academy of Science has explained, "DNA enjoys this preeminent position because of its reliability and the fact that, absent fraud or an error in labeling or handling, the probabilities of a false positive are quantifiable and often miniscule." Thus, DNA is considered to be especially reliable evidence. Indeed, it has been the basis for convictions in numerous cases across the United States and is even the primary ground for several hundred exonerations that we have had in this country in the wake of putting this powerful evidence to use. Since we have harnessed the power of DNA evidence, we seem to feel more certain of our ability to get to the truth of a crime, especially where DNA evidence is available.

Given DNA's reliability and investigative power, several scholars have argued that expanding DNA databases is incredibly valuable. For example, Professor Eric Posner has argued that greater access to Americans' DNA offers us the opportunity to solve numerous crimes—especially the hundreds of thousands of rapes and sexual assaults that take place every year. rape because, "[w]ith a minimal privacy intrusion, it can provide accurate evidence that leads to convictions").

13. SHELTON, supra note 7, at 190; see NAT'L ACAD. SCI., supra note 4, at 130.
14. NAT'L ACAD. SCI., supra note 4, at 130.
15. See id.
16. See supra text accompanying notes 2–8. But see supra note 4 (noting that there is a dearth of good information about how often DNA is used to obtain convictions).
17. See Exonerations Detail List, supra note 6. As of October 23, 2016, the National Registry of Exonerations attributed nearly 20%—or 346 out of 1,900—of exonerations to DNA evidence. See id.
18. See Meghan J. Ryan, Finality and Rehabilitation, 4 WAKE FOREST J.L. & POL'Y 121, 141–42 (2014) (explaining how the DNA revolution has bred confidence in our ability to make reliable judgments in the criminal justice system); see also Ryan, Miranda’s Truth, supra note 2, at 428 (“Recent advances in science and technology have imbued us with considerable confidence in assessing the truth . . . ”).
19. See supra note 9 and accompanying text.

The Bureau of Justice Statistics estimates that 203,830 rapes took place in the United States in 2008. Most rapists are not caught and convicted. DNA testing provides a uniquely valuable approach to this difficult problem. With minimal intrusion, it can provide accurate evidence that leads to convictions. If we really care about rights, we should mandate DNA testing . . . of everyone.
sor Arnold Loewy has said that the universal collection of DNA "would make a better, safer world for all of us." And Professor Andrea Roth has suggested that requiring all Americans to provide DNA samples for the purpose of crime-solving would have the additional effect of curtailing the racially skewed makeup of currently existing databases that mirror the racial biases permeating the criminal justice system affecting arrest and conviction demographics.

Scholars supporting the universal collection of DNA have acknowledged that such widespread collection from innocent ordinary Americans imposes a burden—whether that be the physical intrusion in obtaining the DNA sample or the intrusion on the individual’s privacy by obtaining, having access to, and using the information carried by one’s DNA. These scholars, though, have concluded that the benefits of universal collection outweigh the burdens, making the universal collection of DNA good policy that is also constitutionally permissible under the Fourth Amendment. They argue that

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Posner, supra note 9.

21. Loewy, supra note 9, at 267.

22. See Roth, supra note 9, at 308–09; cf. Wayne A. Logan, Government Retention and Use of Unlawfully Secured DNA Evidence, 48 Tex. Tech. L. Rev. 269, 278 (2015) ("The prospect [of unlawfully securing DNA evidence] becomes especially troubling given the acknowledged racial and demographic skewing of arrests, which becomes inscribed in DNA databases."); Loewy, supra note 9, at 263 ("One must be cautious, however. I am acutely aware of the potential misuses of DNA. Specifically, in the wrong hands, it can allow others to learn of susceptibility to disease or various other genetic traits that an individual might have."); cf. David H. Kaye, On the “Considered Analysis” of Collecting DNA Before Conviction, 60 UCLA L. Rev. Discourse 104, 108 (2013) (suggesting that a search or seizure could potentially take place with “the collection of physical samples,” “the chemical or physical extraction and testing of the DNA molecules in the sample,” “the database entry of the resulting DNA profiles,” “the trawls of the database for matches,” and also “the long-term storage of the physical samples”).

23. See, e.g., D.H. Kaye & Michael E. Smith, DNA Identification Databases: Legality, Legitimacy, and the Case for Population-Wide Coverage, 2003 Wis. L. Rev. 413, 439–40 (2003) ("Despite the understandable concerns over the privacy implications of all DNA databases, we believe that a properly designed and administered national database might well be the best solution to the coverage question."); Loewy, supra note 9, at 263 ("One must be cautious, however. I am acutely aware of the potential misuses of DNA. Specifically, in the wrong hands, it can allow others to learn of susceptibility to disease or various other genetic traits that an individual might have."); cf. David H. Kaye, On the “Considered Analysis” of Collecting DNA Before Conviction, 60 UCLA L. Rev. Discourse 104, 108 (2013) (suggesting that a search or seizure could potentially take place with “the collection of physical samples,” “the chemical or physical extraction and testing of the DNA molecules in the sample,” “the database entry of the resulting DNA profiles,” “the trawls of the database for matches,” and also “the long-term storage of the physical samples”).

24. See Loewy, supra note 9, at 267 ("Because the universal, compulsory collection of DNA does not involve a search, and because, in any event, it is reasonable, it should be allowed and encouraged."); Posner, supra note 9 ("The real justification for gathering DNA of convicts is that it gives police useful information without requiring a serious intrusion. . . . This logic suggests that arrestees should be required to submit to DNA tests—and indeed that the rest of us should as well."). Professor Loewy has also argued that the Fourth Amendment should be viewed from the perspective of the innocent rather than the guilty. See Loewy, supra note 9, at 263 ("More than thirty years ago, I argued
the physical intrusion of obtaining DNA samples from ordinary Americans is *de minimus* because it involves taking only a buccal swab of saliva from each individual’s cheek or requiring an individual to spit into a cup.\(^{25}\) They argue that the intrusion on privacy is outweighed by the investigatory power of DNA: the information from one’s DNA does not reveal anything other than the identity of individuals, and it has the potential to be used to great effect in convicting criminals and exonerating innocent persons, serving the important goal of justice.\(^{26}\) Privacy concerns, they argue, are greatly exaggerated.\(^{27}\)

The Fourth Amendment should be viewed from the perspective of the innocent. I continue to adhere to that view. Viewed from that perspective, universal collection of DNA is a good thing that should be encouraged.\(^{25}\) And this may very well be how the Supreme Court actually interprets the Fourth Amendment. See Erwin Chemerinsky, Dean of the School of Law, Distinguished Professor of Law, & Raymond Pryke Professor of First Amendment Law, University of California, Irvine School of Law, Address at the Appellate Judges Education Institute (AJEI) 2012 Summit: Supreme Court Review—Criminal (Nov. 16, 2012); see also Amy Howe, *Get a Warrant! Today’s Cellphone Privacy Decision in Plain English*, SCOTUSBlog (June 25, 2014, 5:25 PM), http://www.scotusblog.com/2014/06/get-a-warrant-todays-cellphone-privacy-decision-in-plain-english/ (suggesting that the Court’s unanimous decision striking down a warrantless cellphone search as unconstitutional in *Riley v. California* may not be surprising because “the Justices and their families and friends use cellphones and computers and tablets just like the rest of us, and they probably share many of our concerns about keeping our private information private”). Such an approach to the Fourth Amendment would fly in the face of the Amendment’s history—an Amendment that was drafted and ratified by rebel Americans. The Framers were—at least in Britain’s eyes—criminals. Further, this approach of viewing the Amendment from the innocence perspective poses a sorting problem: Who is innocent and who is guilty? Moreover, the approach could exacerbate racial and other explicit and implicit biases on which police suspicion is often, at least in part, based.

25. See, *e.g.*, Loewy, supra note 9, at 262 (proposing that a universal DNA database should be established with samples obtained by requiring every American to spit into a cup); Posner, supra note 9 (arguing that taking a buccal swab from someone’s check is no more intrusive than, for example, having someone blow into a breathalyzer). Of course, when requiring the universal collection of DNA there may also be some hurdles with respect to effectively obtaining everyone’s DNA. Individuals who are likely to commit crimes are probably least likely to volunteer their DNA, even if it is required by law. See infra Part III.

26. See Loewy, supra note 9, at 263 (suggesting that the DNA used for identification cannot be used to determine private information about individuals); Posner, supra note 9 (arguing that obtaining a DNA sample “takes only a moment” and that a DNA profile can reveal only whether someone was present at a crime scene, not “the identities of his parents, or ethnic heritage, or genetic disorders, or the structure of his soul”).

27. See Loewy, supra note 9, at 263; Posner, supra note 9.
Assessing the wisdom of universally collecting DNA requires examining both the privacy concerns that the procedure would raise, as well as the government interest in crime-solving\(^\text{28}\) that universal collection would potentially further. This weighing of interests is not only prudent as a policy matter, but it is also central to the reasonableness inquiry under the Fourth Amendment.\(^\text{29}\)

A. DNA Privacy Concerns

The most obvious objection to universally collecting DNA from Americans is privacy—both in terms of the physical intrusion and the further intrusion on individual privacy.\(^\text{30}\) The extent of the physical intrusion depends upon how law enforcement obtains the DNA sample. For example, the intrusion is greater if an officer obtains the DNA sample though a venous blood draw rather than via a buccal swab or by having an individual spit into a cup.\(^\text{31}\) The individual privacy interests can potentially be far-reaching when DNA analysis is involved because DNA contains such a wealth of information about an individual—from that person's ancestry or race, to his likelihood of developing diabetes or certain types of cancer.\(^\text{32}\) The government

\(^{28}\) The universal collection of DNA could also further deterrence, which would be another government interest perhaps supporting the proposal. This interest does not seem to be at the core of proposals for the universal collection of DNA, though, and it is somewhat speculative to try to assess the level of deterrence that the proposal could provide.

\(^{29}\) See Maryland v. King, 133 S. Ct. 1958, 1969 (2013) ("As the text of the Fourth Amendment indicates, the ultimate measure of the constitutionality of a governmental search is 'reasonableness.'" (quoting Vernonia Sch. Dist. 47J v. Acton, 515 U.S. 646, 652 (1995))).

\(^{30}\) Cf. United States v. Jones, 132 S. Ct. 945, 949–53 (2012) (applying a physical trespass test); Katz v. United States, 389 U.S. 347, 360–62 (1967) (Harlan, J., concurring) (setting out a "reasonable expectation of privacy" test), cited with approval in Jones, 132 S. Ct. at 950–54 (explaining that "the Katz reasonable-expectation-of-privacy test has been added to, not substituted for, the common-law trespassory test").

\(^{31}\) See King, 133 S. Ct. at 1969 ("A buccal swab is a far more gentle process than a venipuncture to draw blood. . . . The fact that an intrusion [like this] is negligible is of central relevance to determining reasonableness, although it is still a search as the law defines that term."); Loewy, supra note 9, at 262 (stating that requiring someone to spit into a cup is less onerous than obtaining a DNA sample from him with a buccal swab).

\(^{32}\) See Lynn B. Jorde & Stephen P. Wooding, Genetic Variation, Classification and "Race", 36 NATURE GENETICS S28 (2004), http://www.nature.com/ng/journal/v36/n11/s/full/ng1435.html; Kay L. Mehers & Kathleen M. Gillespie, The Genetic Basis for Type 1 Diabetes, 88 BRITISH MED. BULL. 115 (2008);
could use DNA samples to determine whether a particular person has likely ever been at the crime scene or even to determine whether that person likely has or will develop Huntington's Disease. It is because DNA contains such a wealth of information about people that many opponents of the universal collection of DNA are so concerned. There are many tools that the authorities could employ to improve their abilities to solve crime—things like consistent video surveillance and thermal imaging—but we have, as a society, opted to preserve our privacy at the expense of perhaps slightly decreased security in some circumstances. We see this idea embedded in the Fourth Amendment, which protects "[t]he right of the people to be secure in their persons, houses, papers and effects, against unreasonable searches and seizures" and involves careful balancing of privacy and security interests.

In the 2013 case of *Maryland v. King*, the U.S. Supreme Court looked at the constitutionality of requiring individuals who were arrested—but who had not yet undergone trial to determine whether they were innocent or

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33. See Randerson, supra note 32.

34. See, e.g., Erin Murphy, *License, Registration, Cheek Swab: DNA Testing and the Divided Court*, 127 Harv. L. Rev. 161, 174–81 (2013); see also Nigel Morris, *A “Chilling” Proposal for a Universal DNA Database*, *Indep.* (Sept. 5, 2007), http://www.independent.co.uk/news/uk/crime/a-chilling-proposal-for-a-universal-dna-database-401503.html (stating that, "after a senior judge called for the genetic details of every person in Britain . . . to be added to the national DNA database, . . . [c]ritics warned that the ‘chilling’ move would infringe privacy, be hugely impractical and have only a marginal impact on crime").

35. U.S. Const. amend IV. In its entirety, the Amendment provides:

> The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

*Id.*

36. See Orin S. Kerr, *Do We Need A New Fourth Amendment?*, 107 Mich. L. Rev. 951, 957–58 (2009) ("Few would deny the need to balance privacy interests and security interests in Fourth Amendment law."); Tracey Maclin, *The Central Meaning of the Fourth Amendment*, 35 Wm. & Mary L. Rev. 197, 199 (1993) ("Whether a particular search or seizure is reasonable is generally determined by balancing the competing interests at stake—the government’s interest in effective law enforcement versus the individual’s interest in privacy and personal security.").

guilty—to be forced to provide samples of their DNA.\textsuperscript{38} The government argued that this practice was intended to help the police ensure the accuracy of the arrestees' identities, but use of the DNA samples was not limited to this purpose, and the corresponding DNA profiles were indeed being entered into the state DNA database for the purpose of aiding crime-solving.\textsuperscript{39} The Court held that the practice was constitutional under the Fourth Amendment, grounding its ruling in the determination that taking DNA samples is no more intrusive than taking fingerprints; it is a routine booking procedure.\textsuperscript{40}

38. See id. at 1965–66.

39. See id. (stating that, three weeks after “King’s DNA record was uploaded to the Maryland DNA database, . . . his DNA profile was matched to the DNA sample collected in the unsolved 2003 rape case” and that, “[w]hat is at issue in this case is not a search of King’s ‘genes,’ but rather a search for his identity,” that “[t]he State clearly has an interest in knowing the identities of the people in its custody,” and, further, that the State’s “interest in solving crimes”—“one of the enumerated purposes of creating the DNA database”—is furthered by routinely collecting arrestees’ DNA). The King Court suggested that entering this information into the database was actually part of the important identification purpose rather than crime-solving. It stated that “[t]he legitimate government interest served by the Maryland DNA Collection Act is one that is well established: the need for law enforcement officers in a safe and accurate way to process and identify the persons and possessions they must take into custody.” King, 133 S. Ct. at 1970. According to the Court, some of the “constitutional justifications” for this include: (1) the government’s “substantial interest in ensuring that persons accused of crimes are available for trials”—that the government will have the opportunity to take measures to prevent a suspect from fleeing because he “knows that he has yet to answer for some past crime”; (2) “[t]he government’s interest in preventing crime by arrestees,” which requires “an assessment of the danger he poses to the public” that can “inform a court’s determination whether the individual should be released on bail”; (3) and “the interests of justice,” which are furthered by “identification of an arrestee as the perpetrator of some heinous crime[, which] may have the salutary effect of freeing a person wrongfully imprisoned for the same offense.” Id. at 1973–74.

40. See King, 133 S. Ct. at 1971–80 (comparing fingerprint and DNA identification, finding that “DNA identification of arrestees . . . is no more than an extension of methods of identification long used in dealing with persons under arrest,” and concluding that “taking and analyzing a cheek swab of the arrestee’s DNA is, like fingerprinting and photographing, a legitimate police booking procedure that is reasonable under the Fourth Amendment”); see also Roth, supra note 9, at 296 (stating that the King majority “reconceptualize[d] the [state] law as deploying DNA typing as a ‘routine booking procedure’ and focuse[d] exclusively on the state’s interest in confirming arrestees’ identities and determining arrestees’ criminal history before making bail decisions”).
Some scholars have worried that the Court’s opinion opened the door for collecting DNA more broadly because the Court premised its opinion of constitutionality on the minimal intrusiveness of collecting DNA and the minimal information that it provides to law enforcement rather than on the diminished privacy interests of arrestees.41 The concern is that, under legislation authorizing the universal collection of DNA, the government will have unprecedented access to private information about ordinary Americans that will significantly impinge on individual liberty.42

Proponents of the universal collection of DNA have argued that these privacy concerns are overblown.43 Not only is the buccal swab or spit-cup DNA grab only a de minimus physical intrusion, but, these proponents argue, very little information can be gleaned from the DNA used to identify individuals anyway.44 In this regard, proponents have argued that DNA analyses assess only “junk DNA,” which can be used only for identification purposes.45 Somewhat ironically, the proponents seeking access to the great investigative power of DNA have suggested that DNA is much less useful than it is thought to be by those who fear that this universal collection of DNA would greatly infringe on individual privacy.

Whether collected DNA can reveal more information than just individuals’ identities is actually more nuanced. The universal collection of DNA

41. *See, e.g.*, Murphy, *License, Registration, Cheek Swab*, supra note 34, at 174–75 (explaining that the Court’s analysis in *King* “suggests that future cases involving DNA typing are much less likely to turn on the status of the . . . defendant as an arrestee than on the Court’s general nonchalance about government genetic testing”); *see also* Roth, supra note 9, at 296 (suggesting that the *King* Court’s small nod to crime-fighting—to which it “devote[d] only two sentences”—was surprising).

42. *See* Murphy, *License, Registration, Cheek Swab*, supra note 34, at 174–75; Roth, supra note 9, at 296.

43. *See, e.g.*, Loewy, supra note 9, at 266–67 (arguing that assessing the propriety of a universal DNA database involves weighing privacy concerns—which amount to “an abstract harm”—“against a concrete good” of accurately solving more crimes); Posner, supra note 9 (suggesting that weighing the privacy interests at stake is like “put[ting] a feather on . . . the scale”).

44. *See, e.g.*, Loewy, supra note 9, at 263 (suggesting that the DNA used for identification cannot be used to determine private information about individuals); Amar, supra note 9 (suggesting that the “parts of the DNA code that identify individuals [do not] reveal[ ] other medical facts”).

45. *See* Simon A. Cole, “Is the “Junk” DNA Designation Bunk?,* 102 Nw. U.L. Rev. Colloquy 54, 56–57 (“In the debate over DNA databases the term ‘junk DNA’ has been invoked by defenders of the databases to blunt privacy concerns. Their argument is that, since forensic STRs are non-functional ‘junk,’ the genetic data stored in databases is meaningless.”); *see also* supra note 9 (citing authors who have suggested that so-called “junk DNA” reveals no information other than identification).
Universal DNA Collection

could indeed give the government unprecedented access to our personal, private information. DNA contains vast amounts of information about one’s identity—one’s history, diseases, family, etc. The extent to which the government actually has access to this private information, though, depends on what exactly the government stores. If the government stores the DNA sample, then the sample can be tested for various private information so long as enough of a non-contaminated and non-deteriorated DNA sample continues to exist. If the examiner develops a DNA profile using just the thirteen loci that are typically examined when attempting to establish identity and then destroys the original sample, then only information about the alleles at those loci will be available. Some commentators argue that the DNA involved in this identification is “junk DNA,” which does not provide any such information—it is in fact just otherwise useless DNA that has been conveniently repurposed for the use of identification. But to say that so-called “junk


47. See Tracey Maclin, Government Analysis of Shed DNA Is a Search Under the Fourth Amendment, 48 Tex. Tech L. Rev. 287, 307 (2015) (noting that “government officials retain the biological materials that produce the DNA profiles”). See generally Lawrence Koblinsky, Recovery and Stability of DNA in Samples of Forensic Science Significance, 4 Forensic Sci. Rev. 67 (1992) (discussing the risks of DNA degradation and contamination); George Bundy Smith & Janet A. Gordon, The Admission of DNA Evidence in State and Federal Courts, 65 Fordham L. Rev. 2465, 2478 (1997) (“Other problems that may affect the validity and reliability of DNA forensic evidence include inadequate laboratory standards and techniques—such as an insufficient DNA sample size, deterioration of the DNA sample, contamination of DNA Sample [sic], improper test procedures, false inclusion (false positive identification), and false negative results.”); William C. Thompson, Tarnish on the ‘Gold Standard’: Understanding Recent Problems in Forensic DNA Testing, The Champion, Jan./Feb. 2006, at 10–11 (“A close look at the field shows that DNA testing errors have been popping up all over the country. Many of the mistakes arise from cross-contamination or mislabeling of DNA samples.”). Additionally, recent research has highlighted the difficulties of calculating reliable profiles and statistics of matches between DNA profiles where the unknown sample contains only a small quantity of DNA. See Natasha Gilbert, DNA’s Identity Crisis, 464 Nature 347, 347–48 (2010); William C. Thompson, Forensic DNA Statistics: Still Controversial in Some Cases, The Champion, Dec. 2012, at 12.

48. See, e.g., Loewy, supra note 9, at 263 (suggesting that the DNA used for identification cannot be used to determine private information about individuals); Amar, supra note 9 (suggesting that the “parts of the DNA code that identify individuals [do not] reveal[] other medical facts”); see also Maryland v. King, 133 S. Ct. 1958, 1967 (2013) (suggesting that “junk DNA” “does not show more far-reaching and complex characteristics like genetic traits”).
DNA” provides only identifying information is incomplete and misleading. The frequently employed “junk DNA” label for these regions of DNA is a misnomer. So-called “junk DNA” also provides significant private information. This portion of DNA contains information related to the likelihood of an individual developing Crohn’s disease, multiple sclerosis, diabetes, lupus, celiac disease, and heart conditions. More specifically, the “junk DNA” currently used for identification contains information for tracking certain diseases in individuals. Surely, there is some question about how predictive or useful this information might be. But, as science and technology continue

49. See MN CHATTERJEA & RANA SHINDE, TEXTBOOK OF MEDICAL BIOCHEMISTRY 243 (8th ed., 2012) (“Recent studies on junk DNA by scientists have shown that it has some essential and useful functions.”); Diana Crow, “Junk DNA Tells Mice—and Snakes—How to Grow a Backbone, Sci. Mag., Aug. 1, 2016 (“[O]ver the past couple decades, geneticists have discovered that this so-called junk is anything but. It has important functions, such as switching genes on and off and setting the timing for changes in gene activity.”).

50. See Cole, supra note 45, at 57–60 (explaining that the DNA used in identifying individuals may be predictive of genes that cause disease). But see infra note 53 and accompanying text (questioning how predictive this information might be).


Just as the argument that nonfunctional DNA cannot be a threat to privacy is superficial, it would be incomplete and misleading simply to inform the public that an STR profile contains information that is correlated to physical traits such as disease and possibly behavioral predispositions and hence could be used to predict whether an individual will develop a disease. By innuendo, this formulation suggests that these nonfunctional loci, which are very weakly associated (if at all) with disease or behavior, are comparable to the loci used in much more powerful modern genetic testing for the DNA sequences of mutations that do cause disease.

Id. He has further stated that these “STR profiles are useless as a ‘genetic test to screen for any particular disease’ and that, while “[n]o one can say for cer-
to rocket forward, we will likely discover even more about what information this type of "junk DNA" can provide.54 The reason we look at this portion of the DNA for identification is that it has some of the greatest variation among humans—in some sense, this means that it can tell us the most about people.55

Of course the fears of making this private information available to the government go beyond guilty persons’ fears that they will be caught; ordinary innocent Americans are also fearful that the private information revealed by their DNA samples will be misused. The information could potentially be provided to insurance companies that might very well use it to charge higher premiums for those with certain medical conditions. It could be provided to pharmaceutical companies so that they could target certain individuals in their advertising. It could be provided to financial institutions so that they could increase one’s rates. Countries like Iceland, Estonia, and Tonga have indeed sold their DNA databases to private companies.56 Some scholars are even worried that the government could use the private information to target potential suspects and criminals who, genetically, might be predisposed to committing certain crimes.57 This seems less likely under our

tain what the future of genetics holds . . . the information coded in the databases is and will remain, with . . . limited exceptions . . . useful only for identification.” Id.

54. See Butler, supra note 52, at 60; Kaye, On the “Considered Analysis” of Collecting DNA Before Conviction, supra note 23, at 118 (“[I]t is conceivable that some of the loci in the strictly identifying profiles could turn out to convey disease-related or other socially significant information that could harm an individual’s legitimate interests.”).

55. See John M. Butler, Fundamentals of DNA Typing 28–29 (2009) (“Only a small fraction of our DNA (around 0.3% or ~10 million nucleotides) differs between people and makes us unique individuals. . . . Variable regions of the human genome provide the capability to use DNA information for human identity purposes.”); Nat’l Inst. Just., DNA for the Defense Bar 6 (2012), https://www.ncjrs.gov/pdffiles1/nij/237975.pdf (“Each of the 13 loci was chosen because of its high degree of polymorphism, meaning that several different possible genetic types exist for each locus.”); see also Maryland v. King, 133 S. Ct. 1958, 1967 (2013) (stating that the term “‘junk’ DNA” “may mislead the layperson, for in fact this is the DNA region used with near certainty to identify a person”).


57. Professor Posner has argued that this is a ridiculous fear, though. See Posner, supra note 9 (“[T]he idea that the police would use DNA evidence of a per-
current rules of criminal law, which generally require both *actus reus* and *mens rea* before a conviction can be found.58

Now, our legislators could pass laws to limit the uses of DNA samples and databases. This would certainly be a deterrent to such misuse of private DNA information.59 But, like in any area, there remains the possibility of rogue agents. Even if it is illegal to use the DNA profile for other reasons, some individuals within law enforcement have a history of bending the rules. Further, as Professor Erin Murphy has explained, “jurisdictions across America [already] engage in ‘rogue’ databasing—the collection and recording of samples in local and unofficial databases that need not comply with formal statutory law.”60 Finally, there is the problem of mission creep: once a universal database is in place, politicians might change their minds about the tasks for which the information can be used.61

**B. The Truth-Finding Power of DNA**

Even if the privacy concerns surrounding the universal collection of DNA were minimal, there would still be a question about whether we should universally collect DNA because the investigatory power of universal collection may not be as powerful as some scholars have suggested. The question, son’s criminal propensity to lock her up before she commits crimes is far-fetched at best.”).


59. *See* Posner, *supra* note 9 (noting that “government officials could conceivably break the law and sell DNA samples to insurance companies or telemarketers, or trumpet private information to the press” but that “they can do that with all the other information they possess—from tax returns to health records”—yet the law deters them from doing this).

60. Murphy, License, Registration, Cheek Swab, *supra* note 34, at 172 (noting that “jurisdictions across America engage in ‘rogue’ databasing—the collection and recording of samples in local and unofficial databases that need not comply with formal statutory law”); Erin Murphy, *Physician Heal Thyself: Whither the Police and Prosecutor in the Tale of Forensic Science Gone Wrong?*, 91 TEX. L. REV. SEE ALSO 101, 110 (2013) (“Some law enforcement officials have assumed authority to engage in certain kinds of database searches (like familial searches), even absent express legislative authority.”). As Murphy has explained, these collections of the “‘voluntary’ or ‘abandoned’ samples . . . have been almost universally held constitutional.” Murphy, License, Registration, Cheek Swab, *supra* note 34, at 172.

61. *See* Sonia M. Suter, *All in the Family: Privacy and DNA Familial Searching*, 23 HARV. J.L. & TECH. 309, 316–18 (2010) (identifying the problem of mission creep where DNA collection is involved); *see also* Maclin, *The Central Meaning of the Fourth Amendment*, *supra* note 36, at 306 (noting that the Supreme Court Justices in King “were informed of, but expressed no concern about, the way federal and state DNA databases have expanded their reach over the years”).
then, is whether the improvement in crime-solving resulting from the universal collection of DNA would outweigh the risk and magnitude of privacy intrusions resulting from the practice and the resources that universal collection would require.62

Despite popular belief, there is a serious question about how effective universal collection of DNA would be in solving crimes. DNA is certainly a powerful identification tool, but this does not necessarily mean that the universal collection of DNA will improve crime-solving much.63 There is an empirical question about whether adding the DNA profiles of millions of Americans to DNA databases is going to improve our ability to solve crimes. First, many offenders are recidivists, and for these offenders, their DNA may very well already be in the system.64 In fact, there are already well over 12 million profiles in DNA databases.65 More importantly, too little DNA evidence is found at crime scenes and subsequently analyzed by forensic laboratories.66 Indeed, research suggests that this is more problematic than having too few DNA profiles in the databases.67 Many jurisdictions do not have

62. This question is one of good policy. In the constitutional question, it is likely that only security and privacy interests, and not the resources at stake, would be in play. See supra note 36 and accompanying text.

63. An improvement in crime-solving could be measured by crime rates, clearance rates, or other metrics.

64. See Brandon L. Garrett & Erin Murphy, Too Much Information, SLATE (Feb. 12, 2013), http://www.slate.com/articles/news_and_politics/jurisprudence/2013/02/dna_collection_at_the_supreme_court_maryland_v_king.html (noting that many offenders have prior convictions, which means that their DNA should already be in the databases).


66. See Dale et al., supra note 4, at 3; Murphy, License, Registration, Cheek Swab, supra note 34, at 181–82; Peterson et al., supra note 4, at 9, 123, 125.

67. See Jeremiah Goulka et al., Toward a Comparison of DNA Profiling and Databases in the United States and England, 1 RAND (2010), http://www.rand.org/content/dam/rand/pubs/technical_reports/2010/RAND_TR918.pdf (concluding that “database matches are more strongly related to the number of crime-scene samples than to the number of offender profiles in the database,” which “suggests that ‘widening the net,’ which research indicates has only a minimal deterrent effect, might be less cost-effective than allocating more effort to samples from crime scenes”); Murphy, License, Registration, Cheek Swab, supra note 34, at 181. As Professor Murphy has explained, “[s]tudy after study has shown that it is improving the collection of DNA from crime scenes, not from known offenders, that would make a real difference in solving cases.” Id. In her view, “the real crisis in DNA collection is not the inadequacy of the ten-million-plus-person database of known offenders, but that of the 498,600 crime scene sample database.” Id.
dedicated and trained crime scene investigators, and an increase in the number of individuals’ DNA profiles that must be analyzed may actually decrease the work that can be done on the other side of the equation, as there are already backlogs of DNA profiles to be tested.

Proponents of universal DNA collection also assert that this expansive database will help clear the innocent. But if an innocent person is a suspect in any particular case, he can voluntarily submit to a DNA test; having the universal collection of DNA likely will not help him. Further, DNA may be the gold standard for identification, but it still poses the risk of mistakes. For example, the use of degraded samples can lead to faulty “matches,” samples can be contaminated, and there is the risk of human error—such as a lab technician’s mix-up of sample—or even fraud. Additionally, there is always the chance, no matter how small, that a match will be reached even if the samples are not from the same individuals. Finally, a matching DNA profile does not necessarily mean guilt. DNA may be left at a crime scene for other reasons, such as if the individual was at the scene before the crime occurred. So DNA, like other forensic science evidence, has the ability to lead to wrongful convictions.

Ultimately, moving to a practice of universally collecting DNA would amount to a shift in resources. Obtaining, analyzing, and uploading DNA profiles can be expensive, and we are in a system of limited resources. We

68. See Jennifer E. Laurin, Remapping the Path Forward: Toward A Systemic View of Forensic Science Reform and Oversight, 91 Tex. L. Rev. 1051, 1080–82 (2013) (“The primary engines of evidence collection occupy the opposite end of the specialization spectrum, as they are typically patrol officers—the most junior, least trained, and most overtasked personnel in the police hierarchy.”).


70. See, e.g., Loewy, supra note 9, at 266 (“Under my proposal ... the government can learn the identity of innocent people by determining that their DNA does not match that of the perpetrator. Surely, this is a good thing.”).

71. Ryan & Adams, supra note 8, at 1083 (“Errors can still occur with respect to DNA evidence ... . For example, laboratory tests can be mislabeled or contaminated, and an analyst could make a mistake or even possibly fabricate results.”); Meghan J. Ryan, Remediating Wrongful Execution, 45 U. Mich. J.L. Reform 261, 274 n.89 (2012) (“[W]hile DNA evidence can be ‘uniquely probative’ of a defendant’s innocence, it is not conclusive. For example, the defendant may not have left behind any of his DNA, and the trace DNA evidence examined could belong to his partner or an innocent individual.” (internal citations omitted)).

72. See generally Smith & Gordon, supra note 47, at 2472, 2488.

73. See id.

already have huge backlogs in DNA testing—for cases like rape and also for convicted offenders claiming innocence. So, what will imposing this heavy collection burden mean for future police work? Will it shift resources from putting officers on the streets to collecting and developing millions of DNA profiles? Will police become less experienced and practiced investigators because they will now be relying more heavily on DNA? Will they get tunnel vision and focus only on DNA even though there may be countervailing evidence in a case? For the universal collection of DNA to improve crime-solving, resources must be funneled into collecting DNA from all Americans, significantly increasing the collection of DNA evidence from crime scenes, and carefully analyzing of all of these samples. Perhaps in a world of unlimited resources, this could improve crime-solving, but in our more limited world I wonder whether this shift in resources would be more effective than, for example, employing more police officers, investing in childhood education, and improving the living conditions of individuals in poor communities.

IV. CONCLUSION

DNA analysis is a powerful tool in crime-solving, but it is essential to understand the limitations of DNA analysis and some of the complications that arise when requiring all Americans to submit to DNA testing for the purpose of solving more crimes. Individual privacy could be seriously compromised by requiring government access to all individuals’ DNA. Further, limited resources hamper DNA’s power to improve crime-solving. Considering these drawbacks should be central to considering whether the universal collection of DNA is smart policy and also whether such a scheme would be constitutionally viable under the Fourth Amendment. More broadly, allowing government access to the vast array of information that our DNA holds could degrade the Fourth Amendment requirements of reasonableness. What sort of privacy we can reasonably expect could be vastly diminished if this becomes the norm. It could have far-flung implications for other government crime-solving initiatives and surveillance operations.

Michael Tonry, *The Functions of Sentencing and Sentencing Reform*, 58 Stan. L. Rev. 37, 57 (2005) ("The criminal justice system has limited material and manpower resources.").