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With Liberty and Justice for All: The Costs and Benefits of DNA Databases

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**Publication Date**

2014-04-01

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Honors 14

March 2014

With Liberty and Justice for All

The Costs and Benefits of DNA Databases

### **Reflective Essay**

I'm a philosophy major. Since transferring to UCLA the only papers I have written have been philosophy papers, and this is worth mentioning because philosophical writing is different from regular academic writing. It is different in many ways, but the relevant distinction is that philosophical writing need not include citations, quotes, nor even involve research. In my time at UCLA, I have not had a writing assignment that required a bibliography. This probably seems like a terrible way to begin a reflective essay about my research process. All that I am trying to say is that an A paper in philosophy can be one without any sources whatsoever. The reason I am trying to say this is to provide context for the style of my submission. It is a research philosophy paper, and I think that makes my research process unique.

The idea for my paper topic came from a class discussion. The course for which this paper was written is called *Interaction of Science and Society*, but I think that course title is unhelpful. First, it implies that science and society are separate.<sup>1</sup> Second, it overlooks the issue that is the true heart and backbone and other body parts of this course: ethics! Each class meeting consists of a brief description of the topic and then turns over to a discussion of its ethical justifications and implications. For one of the class meetings, the topic was DNA fingerprinting and national databases. This was not a topic I had ever thought about previously, so I was surprised to find myself defending the idea of a universal DNA database against the objections of my classmates. That I had such vehement feelings about the topic seemed meaningful, and thus the idea for my paper took form.

I researched my topic in the way that made the most sense to me, from easy to complex sources. My starting point was the required text for the class, a book by James Watson and Francis Crick that explains the history of DNA and includes a chapter on DNA fingerprinting. I knew that I wanted to give a brief account of how DNA fingerprinting works for the introduction to my paper and I have come to realize that briefly describing anything requires fully understanding it in detail. So I conducted some quick and dirty google searches for more clear explanations of the fingerprinting method. This took me to several websites that I ended up citing in my paper. Some of the websites contained trustworthy scientific data while others were opinion pieces arguing for or against the idea of universal DNA fingerprint databases. At this point I would like to explain the inclusion of these various websites in my research and bibliography. I realize that webpages

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<sup>1</sup> I disagree and think that science is an institution reflected in and constituted by society.

are not considered ideal sources. The information is notoriously unreliable and the arguments of journalists are not necessarily significant. However, it should be clear that my paper is not relying on these types of online sources to support my own argument. Rather, they were used to familiarize myself with the topic and its issues, with the understanding that any of the content may or may not be reputable. Most importantly, the information helped guide me on the second half of my research.

The second phase of my research took place on JSTOR using UCLA's access to journal databases. Here I searched for articles using keyword ideas found from the first phase of my research. For example, I now knew that familial DNA searches are a particularly controversial area of debate and that the statistical significance of a positive DNA profile match is sometimes confusing and deserves a quick mention. The real substance of my JSTOR research though, was the philosophical publications and law reviews that discussed the ethical issues of this topic. As for how I chose the articles that I did, it just requires getting good at skimming very long and dense papers for keywords so as to identify which are relevant and will make for good sources.<sup>2</sup>

I am somewhat self-conscious of the fact that few of my sources are books. However, I believe that my topic, and the way I chose to approach it, lent itself better to journal publications. The focus of my paper is to give an ethical, legal, and practical analysis to the question of "Should there be a universal DNA database?" and it is journal articles more so than books that feature philosophical arguments regarding contemporary issues. Plus, my bibliography is fairly diverse, containing papers that range from two pages to over one hundred, philosophical publications, law reviews, legal notes, government reports, and a New York Times op-ed.

So how is my paper and use of research unique? I said earlier that this is a research philosophy paper, and I mean something specific by that. The purpose of my sources is not to support my conclusions but to inform the arguments I make for them. What this means is that the approach I take in my paper, while influenced by my research, is entirely my own. The arguments I make are supported merely by the rules of logic, as opposed to the reputations of important academics. And my conclusion... well I'm sure it isn't original, but philosophy rarely is.

## **Preface and Thesis**

Catching the bad guy is a national pastime. The premises of countless books, movies, and television shows are based on this theme, and the public interest in true-crime stories and real criminal trials corroborates this. As such, the media portrayal of the criminal justice system is most likely responsible for the generalized understanding people have regarding the process of

crime-solving. The good guys of these stories come in many forms, perhaps a no-nonsense detective or an idealistic lawyer, but over the past years a new kind of hero has emerged: the science of DNA.

The development of DNA analysis has been a game changer for many fields, not the least of which is criminal investigation. Viewers of any police procedural show are probably familiar with words like DNA fingerprinting, partial match, and CODIS. But besides playing a decisive role in the “Gotcha!” moment of crime stories, these words refer to very real tools used by criminal investigators to identify suspects and convict perpetrators. Moreover, these tools are the center of a contemporary debate about the importance of personal rights versus public security. The debate is about DNA databases.

The purpose of this paper is to explore the contrast between the theoretical and practical implications of DNA databases and to reach a conclusion about what the future of this system ought to be. The first part of the paper will provide background information for the issue by explaining how DNA profiling works and describing the current status of DNA databases in the United States and some parts of the world. The second part will discuss the costs and benefits of DNA databases, focusing on the issues of privacy, fairness, safety, and justice. The different scopes of DNA databases will be analyzed under ethical, legal, and practical considerations. The third and final part of the paper will attempt to answer the question: Should there be a universal DNA database?

## **Part I – History and Explanation of DNA Profiling and DNA Databases**

### **DNA Profiling**

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<sup>2</sup> To be clear, everything was later read closely and my research folder contains at least 8 articles that were decided to be irrelevant or redundant upon closer examination.

DNA profiling is the technique used to identify individuals based on their unique genetic makeup. Originally called DNA fingerprinting, it was discovered by British geneticist Alec Jeffreys in the 1980s when he noticed a section of DNA that repeated throughout a genome. The repetitive sequences are known as Variable Number of Tandem Repeats (VNTRs) and they are present in everyone's DNA profiles, but the pattern in which they manifest is different enough in all individuals (except identical twins) as to constitute a method of identification. The current method of DNA profiling in a criminal investigation involves analyzing Short Tandem Repeats (STRs), which are small specific alleles in a VNTR, and comparing the STR regions in suspected profiles against the same STR region in the profile found at a crime scene. Because many people may share an allele count at any one STR region, it is important to use several regions to ensure an accurate match. In the United States, the Combined DNA Index System (CODIS) uses 13 allele pairs to compare, while the United Kingdom uses 10. A greater number of allele matches between suspect and crime scene DNA profiles means a greater probability that the suspect was present at the crime scene. Taking into account the evidence that made the person a suspect in the first place, DNA profiling can effectively determine that person's guilt under the standards of the law.

One other significant fact about DNA profiling is about the genetic information it provides. The VNTR sequences that make up DNA profiles are considered "junk DNA" because they do not, in theory, reveal genetic information about the individual from whom the sample comes. This fact distinguishes DNA profiling from complete gene sequencing. Gene sequencing would reveal all of the genetic facts about a person, like medical information, physical (phenotype) characteristics, and possibly behavioral traits. DNA profiling from junk DNA is meant to preserve much of the privacy of the individual, although there are still facts that can be

discovered from VNTRs. The most important of these is the ability to make familial matches based on similarity of STRs. This has controversial consequences that will be discussed later.

[1, 2, 3, 4, 5, 6]<sup>3</sup>

### **DNA Databases**

Given the technique of DNA profiling through comparison of STR regions, there must be a system that stores the evidence and data to be compared. This is where DNA databases come in. A DNA database is simply that – a database of DNA data. Different scopes of DNA databases make it less simple. A forensic index contains DNA profiles from crime-scene evidence where the perpetrator of the crime is unidentified. This kind of database is analogous to a police evidence locker, and it is not a controversial system. An offender index contains the profiles of certain criminals who have been convicted. An arrestee index increases the scope of available data to contain profiles of people arrested, but not convicted, for certain crimes.

The classes of criminals and crimes that are included in offender and arrestee databases may vary from state to state or from country to country but generally includes violent felonies. In the case of offender and arrestee databases, the following are controversial issues:

- 1) the classes of crime that determine inclusion in a DNA database
- 2) how long DNA profiles may be kept and the rules for requesting destruction
- 3) how and when to execute DNA profiling and whether familial searches are allowable

The final type of index has the biggest scope and the biggest controversies. A universal database would include DNA profiles from all citizens or inhabitants of that country. Practice of a universal database does not currently exist in any country, but the idea has been proposed in the United States and the United Kingdom as a potentially better system. Obviously there are

benefits and costs to such a system, many similar to the issues for offender and arrestee databases, and these will be discussed in the second part of the paper.

There are a few other facts that are worth mentioning regarding DNA databases. The United Kingdom instituted the world's first national DNA database for criminal investigations. The term "national database" merely indicates that it is supervised by the government and does not necessarily denote a universal database, which would likely also be run by the government. The UK has the largest database of profiles relative to the population of the country, but the United States has the largest number of discrete profiles (with UK second and California third). California as a state has the third largest number of profiles in the world and is one of the states that has passed legislation allowing law enforcement to collect DNA samples from arrestees. This fact relates to the organization of the United States' National DNA Index System. The term CODIS refers to the index on a national level, but the database is actually compiled from state indices that follow state laws regarding DNA collection, storage, etc. So, when the question "Should there be a universal DNA database in the United States?" is raised, the answer depends on whether United States DNA databases should be managed on a federal level and then on whether it should be mandatory to collect DNA samples from all citizens. [1, 2, 3, 4, 6, 7, 8, 9]

## **Part II – Ethical, Legal, and Practical Considerations**

This part of the paper will discuss the significance and problems of different scopes of DNA databases, focusing on issues of privacy, fairness, safety, and justice. Although the issues will be analyzed under ethical, legal, and practical considerations, the entire problem is, in a way, ethical. Whether or not a society wants to promote personal rights such as privacy and fairness over public safety depends on what values are deemed "the most good." Also, laws in general are

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<sup>3</sup> Many of these sources have similar information. Placing the citation at the end of the paragraph/section is meant to indicate that the preceding information is compiled from several sources. It is a stylistic choice as placing the

made with moral judgments in mind weighed against practical facts. But, once again, deciding whether or not to favor practical matters over the rules of a moral theory depends on what consequences and motives are deemed the most good. The overall point is that the answer to the question “Should there be a universal DNA database” changes depending on which consideration is primarily taken into account. This means that there cannot be a simple perfect answer to the question. The purpose of this paper then is to find a balance between the various considerations in order to provide the “most good answer.”

### **Ethical Considerations**

In academic parlance, ethics is a branch of Philosophy concerned with how people or states should act (morality) and with formulating systematic reasons for why certain actions are good or not (moral theory). As in all of philosophy, ethics attempts to approach its subject matter deductively. This is a top-down method that moves from (the most) general premises to more specific conclusions. The upshot to this strategy is that if the general premise(s) are true, the conclusion is unquestionably valid. The downside of this strategy is that so far, in the history of philosophy, finding a true general premise has shown to be difficult, if not impossible. Many moral theories have been proposed, but all of them are problematic (i.e. lead to logical or common sense contradictions). Still, the most famous, and most likely, theories are the best way to approach an ethical problem such as DNA databases. The most famous two theories are Utilitarianism and Deontology. Utilitarianism is consequence-based; the ends justify the means. The best action is the one that leads to the best consequences. What counts as a good consequence varies with different philosophers, but it is generally that which promotes the greatest amount of happiness in the greatest amount of people. Deontology is rule or duty-based. Having the correct motives for following a certain rule is what makes an action good. Again,



what counts as a good motive or a good rule depends on the philosopher. An example of a deontological rule could be: Murder reflects a bad motive, so you must not murder. Although this seems like a solid rule to have, it would not be able to accommodate a situation in which you should murder one person (say Hitler) in order to save the lives of many, because strict deontology says you are never supposed to commit murder. Alternately, utilitarianism would definitely allow you to murder one person to save many, because it would promote more happiness overall (say ten people being alive versus one). However, strict utilitarianism would also allow you to murder one person to harvest his organs in order to save the lives of ten people who need transplants. This is a very rough picture of these moral theories, but the takeaway is that ethics and common sense often conflict, and this affects the analysis of moral issues.

Besides murder, other important moral issues include privacy, fairness, safety, and justice. An ideal social law or institution would try to maximize all four issues, or at the very least avoid infringing on any of them as much as possible. With that in mind, now we can discuss the costs and benefits of DNA databases.

All of the scopes of DNA databases being considered here (offender, arrestee, and universal) try to promote safety and justice without doing so at the expense of privacy and fairness. Justice is the easiest to analyze. According to the FBI CODIS website, “The success of the CODIS program will be measured by the crimes it helps to solve... As of January 2014, CODIS has produced over 234,200 hits assisting in more than 224,800 investigations.” [4] Those seem like positive numbers, meaning that CODIS has positively helped promote justice by assisting law enforcement in their investigations. Besides the statistic, there are also many cases where DNA profiling helped identify and convict perpetrators. Furthermore, thanks to DNA profiling and the work of the Innocence Program, many falsely accused persons have been

released and pardoned. From a moral perspective, and in fact any perspective, these seem like good consequences because promoting proper execution of justice is good.

Safety is another good consequence of DNA databases. On the one hand, it makes sense to think that the more accurate identifications and convictions of criminals are, the safer a society is, because there will be less criminals on the street. This is potentially a difficult thing to calculate in real life however, as it is also the case that U.S. prisons are poor at promoting overall safety, as many convicts released from prison are made more aggressive by their time there. Several studies have been made that report the rates of repeat offenders and the preventability of certain crimes by collecting DNA profiles from arrestees.<sup>4</sup> [1, 13, 18]

Regarding the issues of justice and safety, both issues are maximized by DNA databases. In fact, it seems to be that more DNA profiling, and hence larger databases, promotes more justice and safety. So under particular considerations, that is to say valuing the moral issues of justice and safety above everything else, universal DNA databases are a good idea.

This may seem like an obvious conclusion, for of course a society where everyone's DNA was on file would be one where identifying criminals would be fairly easy. And of course there is an obvious problem that follows from this idea. A universal DNA database would, more than offender and arrestee indices, infringe on people's right to privacy.

Privacy then can be the next issue to analyze. Assuming there is a moral right to privacy,<sup>5</sup> a universal DNA database could be considered to abbreviate individual privacy in an unacceptably significant way. In a biological way, DNA information reflects an individual's

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<sup>4</sup> Prison conditions and the conclusions of research studies are practical facts, however, and shall be disregarded for this discussion of ethical considerations. The reason why this is appropriate is because strictly philosophical ethical arguments should be analyzed on the strength of the theory given certain moral assumptions rather than the probability or appropriate relevance of real world facts.

<sup>5</sup> This paper is assuming that all of these moral rights exist because it would be far beyond the scope of this paper to argue for them.

status as a human being and their unique personhood. Respect for both of those properties is an important moral consideration and a common way (philosophically speaking) of demonstrating that is through respect of privacy. A universal database infringes on an individual's privacy in two ways:

- 1) allowing the government, and possibly other people, to be able to access a person's private genetic information
- 2) violating a person's privacy by treating them like a suspect through their inclusion in a database used for criminal profiling

However, both of these statements have possible objections that can be offered by a proponent of a universal DNA database. An objection to the first type of privacy infringement is available through the distinction made earlier about the difference between DNA profiling through VNTRs and complete genetic sequencing. DNA profiling through VNTRs reveals little to no personal information other than an individual's biological sex. Now an argument against the publicity of an individual's biological sex information is possible, but seems unlikely to be seriously meaningful considering that biological sex is not something that people can be private about.<sup>6</sup> Nevertheless, critics of a universal database using this privacy argument might respond that it is a slippery slope from collecting a sample of DNA from everyone for the purpose of VNTR profiling and collecting a sample for other uses. (Mistrust of government is also more of a practical fact so it shall be disregarded here.) Then again, if it were the case the DNA could be collected for a universal database where the original sample of DNA was discarded after the "fingerprint" was made, this would negate objections to the ethical consideration of privacy.

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<sup>6</sup> Admittedly there are exceptions in the case of transgender people, but it is unclear if this is a line of reasoning that need really be pursued.

So perhaps the first type of privacy infringement is not relevant to the ethically considered question of universal DNA databases; what about the second? Proponents of a universal DNA database can approach the second type of privacy infringement in a couple ways. It might be possible to claim that being included in a criminal profiling search for the sake of being ruled out is actually neither a violation of privacy nor a moral issue. On the one hand, this could be seen as just a sly move to avoid a problem by denying its existence. On the other hand, there does not seem to be an obvious reason to view it as a moral problem. In fact, even if it was a violation of privacy, it is still not be a moral issue because it is reasonable to think that a violation of privacy that is unknown to a person does not morally affect them. Such an idea would apply here assuming that the DNA profiles are searched automatically without informing the individual that their profile is being accessed. This itself is a reasonable assumption in a universal DNA database society, for people would already expect to have their profiles searched. This leaves the objection that it is a legal issue (which will be addressed in the legal section). Surprisingly, this means that from an ethical perspective of privacy, a universal DNA database is (arguably) not a problem.

However, ethical privacy considerations reappear in cases of offender and arrestee databases. There is another way in which DNA databases can infringe on people's privacy that was not mentioned in the universal databases section above because it is only relevant to incomplete databases. It has to do with familial searches. When the DNA from a crime scene is run through the database (assume CODIS offender index for now), investigators are hoping to find an existing profile that matches up with all 26 alleles (13 pairs), which would mean that they have identified an individual who was likely at the crime scene. If only some allele matches are made this constitutes a partial match, and if partial matches occur on a significant number of

alleles this indicates that a close relative of the partially matched profile was at the crime scene. But a partial match is not the same as a familial search. According to George Washington University law professor Jeffrey Rosen, “The main difference between the two techniques is that partial matches emerge inadvertently from a routine search of the database while family searches represent a second, deliberate trolling of the database for close biological relatives after the first search has failed to produce a perfect match.” [7] If a deliberate familial search was carried out (and some states do allow it), the next step would be to release the name of the partially matched individual to the police so that the individual’s family members can be investigated. This is definitely a privacy issue.

Running the DNA profile of a convicted offender against a crime scene sample is one thing, but using that profile to cast suspicion or incrimination upon that offender’s entire family is quite another. Earlier in the universal database section it was proposed that infringing on a person’s privacy without their ever learning about it may not be a moral issue (although it may certainly be a legal issue). In a non-universal database system, the situation is not the same, because the family members (that best fit the profile) will need to be questioned and likely asked to provide a DNA sample. The problem of privacy infringement increases if the context of the situation is a familial search yielded from an arrestee index partial match. States that have arrestee indices will have a larger pool from which to return a partial match, thereby increasing the chance of a partial match and increasing the chance of privacy infringement as a whole, for more family members will be subject to suspicion and investigation. This paper is about the implications of different scopes of DNA databases, so the question of whether familial searches are a problem is not the issue at hand; it would be relevant in a discussion about the role of DNA profiling. What matters is that, given that the practice is allowed in certain places, familial

searching affects the analysis of certain DNA databases. On the ethical issue of privacy, familial searches are problematic for offender and arrestee indices (and inapplicable to the question of a universal DNA database). [1, 7, 10, 11]

Not only are familial searches in offender and arrestee indices violations of privacy, they are also violations of egalitarianism. Put another way, they are unfair. In a way, the unfairness and the infringements of privacy are directly related, because it is unfair that certain people are going to be selected to be targets of suspicion and investigation. But besides this general unfair distribution of privacy infringement caused by familial searches, there is a more pernicious unfairness present.

Racial discrimination is a pervasive problem in the criminal justice system, where young black men in particular are overrepresented in convictions and arrests. “In the United States, courts convict some racial minorities at much higher rates than their proportion of the overall population...Criminologists agree that racial discrimination is greater at the level of arrest than it is at the level of conviction, because arrest depends so heavily on police discretion.” [6] This means that offender and arrestee databases promote unfairness because certain classes of people will be disproportionately targeted for DNA profile comparisons and (possibly) familial searches. A counterargument that might be made, modeling a statement made earlier, is that if individuals are not aware of the searches, no harm is done and so this is not a moral problem.<sup>7</sup> In the privacy issue, after all, it seemed that the lack of harm done to individuals whose profiles are searched without their being aware was possibly enough to deny that there was a moral problem. A similar conclusion could then, suggests the counterargument, be drawn regarding privacy of individuals in a database who belong to a disproportionately represented group. While that does seem to

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<sup>7</sup> The counterargument would have to disregard the effects of familial searches, but since that is a relatively rare allowance, the counterargument itself is still worthy of discussion.

follow for the issue of privacy, it should be recognized that the issue of fairness is very different. Issues of privacy only apply to individual rights and harms. Issues of fairness can apply both to individuals and to groups/communities/societies. Maybe being subject to DNA profiling searches without being aware is not harmful to a single black man, and hence not unfair, but that conclusion does not automatically translate to a lack of unfairness for a group. On the contrary, it definitely seems unfair for a certain group to be disproportionately represented in a criminal database. This kind of inequality is harmful as well, because it exacerbates the problem of discrimination that occurs on the arrest and conviction level. Therefore, the issue of unfairness in offender and arrestee databases is a moral problem.

What about unfairness for universal DNA databases? Well, like with familial searches, issues of unfairness are not relevant in a universal database. If everyone's profile is in the database, there should be no need for familial searches to identify suspects not in the system. Similarly, if everyone is included, there can be no disproportionate representation of certain groups.

Having analyzed the different scopes of DNA databases under ethical considerations of justice, safety, privacy, and fairness, some tentative conclusions can be drawn. Offender and arrestee databases are subject to moral problems of privacy and fairness in varying degrees, but they do promote justice and safety. A universal DNA database promotes the highest amount of justice, safety, and fairness. It is debatable whether the ethical issue of privacy is a problem for a universal database. This suggests that a universal DNA database is the best ethical option, preferable to offender and arrestee only databases. Then again, it seems impossible to know how to evaluate any of the four issues against each other, so it could also be that the privacy risks

outweigh the other benefits. In any case, these are only conclusions from a purely ethical point of view. Analyses from legal and practical considerations are still required. [6, 7, 10, 11, 14]

### **Legal and Practical Considerations**

The legal and practical sections of this paper are going to be much shorter than the ethical section. This is because much of the background explanation for certain legal and practical problems has already been explained in the ethical section. Furthermore, as mentioned earlier, many legal and practical considerations boil down to ethical ones. As such, only specifically legal and practical considerations will be addressed in these sections.

This section on legal considerations focuses almost entirely on legal issues of privacy. The facts about DNA databases and their implications for justice, safety, and fairness are largely the same under legal and ethical considerations. However, one difference exists for the issue of safety and one for the issue of justice. In a legal consideration, deterrence (i.e. the prevention of future harms) is an important feature of safety. It would be legally relevant to know whether certain scopes of DNA databases are more or less likely to deter future crimes. However, this seems impossible to calculate. The scopes of DNA databases differ from country to country and, in the United States, from state to state, but it would not be helpful to compare average rates of crime for offender versus arrestee places because too many other factors affect crime rates. Furthermore, there are no universal DNA databases to compare with, although it might be speculated that a universal system would be the most effective deterrent. But again, this is impossible to know, so issues of safety will continue to be focused on studies and estimates of crime prevention as described in the ethical considerations. In a legal consideration of justice, one question to raise is whether DNA databases conflict with the idea of “innocent until proven guilty.” [6] As DNA database searches are understood as techniques of criminal investigation, it



would seem that the straightforward answer is that there is a conflict. The United States Constitution does not have any explicit text regarding the presumption of innocence, but the idea is considered to be functionally present in the legislation. In any case, if a DNA profiling search is comparable to being treated as a suspect, as seems to be the case regarding ethical privacy issues, there is a conflict between the practice of DNA profiling and the presumption of innocence. Then again, there are identification-type databases (DNA and traditional fingerprinting) for fields besides criminal investigation. Collecting DNA samples from teachers or military personnel is not viewed at all through a lens of innocent or guilty judging. So it cannot be the case that merely collecting DNA counts as presumption of anything. This means that it is only the act of searching DNA profiles that is relevant. If it is only the act of searching that matters, regardless of whose DNA it is or when and how it was collected, then the different scopes of databases does not matter for this problem. It follows that any system of DNA databases for criminal investigation is at odds with the presumption of innocence standard. Consequently, the legal issue of justice regarding presumption of innocence does not affect the question of what scope of DNA database is best; it instead claims that all DNA databases are wrong or legally inappropriate.

This leaves the legal issue of privacy to deal with. The Fourth Amendment prohibits unreasonable searches and seizures and requires any warrant to be judicially sanctioned and supported by probable cause. [19] The phrase “unreasonable search and seizure” provides a rich basis for legal debate regarding the scopes of DNA databases. The collection of DNA samples falls under some form of “search and seizure” so the important matters are to figure out what counts as “unreasonable” and what can legally be done with the collected DNA. At this point it should be clarified that this is not a legal paper and this section does not propose to figure out

how best to interpret the Constitution. Rather, the plan is to borrow the general interpretations from legal theorists and court rulings and to analyze the opinions and how they relate to the different scopes of DNA databases. Additionally, it should be clarified that while the controversy about familial searches is a legal privacy issue, it is not relevant to legal DNA database questions. The problem with familial searches is instead about what methods of DNA profiling are allowable, and that question is not a focus of this paper except when it relates to DNA databases.

In the United States, the collection of DNA samples for the purpose of DNA profiling has been considered a reasonable extension of more traditional police procedures like fingerprinting. Accepting DNA profiling in this basic identification role requires accepting some form of DNA database to be able to make comparisons, so it would follow that at the very least offender indices are allowable. All states in the U.S. do have their own offender index, so this line of reasoning for allowing the least controversial type of DNA database correlates to real life. In a common-sense way, collecting DNA samples from convicted individuals seems not at all unreasonable, whereas the justification for collecting samples from arrestees is less clear cut. Opinions on one side worry that collecting DNA from arrestees is unreasonable, largely due to concerns about violations of privacy. The other side seems swayed by the beneficial consequences of arrestee indices. Trying to decide which of the sides makes a better point based purely on legal concerns seems somewhat arbitrary. The adoption of either side into a legal system would have to be decided on the basis of whichever reason, privacy or justice/safety, is considered the more valuable and moral. Concerns about arrestee indices have continued to be debated, and only some states have legislation allowing it. A recent landmark ruling by the Supreme Court on DNA from arrested individuals occurred in 2013 and has important

implications regarding the future of privacy and technology. The Court ruled that it was acceptable for the state (of Maryland in this case) to take DNA swabs after arrest and before conviction. Of course, whether or not to implement an arrestee index is still decided by the state, but the *Maryland v. King* ruling upheld that such a practice is constitutional. So, under the U.S. Constitution, offender and arrestee databases are legal. [12, 15, 16, 17]

There is no such ruling available, however, to easily answer the question of whether a universal DNA database would be legal. Clearly, state laws and the *Maryland v. King* ruling by the Supreme Court justify the practice of offender and arrestee databases by understanding them as expansions of other common investigative techniques that law enforcement is allowed to carry out. It would be very difficult, maybe impossible, to justify a universal DNA database from this kind of reasoning. Theoretically though, if it were the case that all citizens and inhabitants of the U.S. were required to have their fingerprints in a government database, an argument could then be made for DNA profiling as well. On the other hand, the reluctance shown by so many states towards the practice of an arrestee index indicates that concerns about privacy issues are very influential. If states are worried about privacy issues from collecting DNA from arrestees, it seems unlikely that opinion would shift to being comfortable with the idea of universal database. To be clear, nothing about these legal considerations settle with certainty that a universal DNA database could never be legal in the U.S. It just means that that right now there is no reasonable legal interpretation to support it.

The lack of a constitutional basis for adopting a universal DNA database is not merely a legal consideration. It also presents a practical problem. Practical considerations of DNA databases are the final area to be explored. This section of the paper is meant to explain how certain facts of the matter affect certain scopes of DNA databases. Practical considerations need

not take issues like privacy, fairness, justice, and safety into account. Instead, practical considerations affect how a system is judged. The whole point of practical considerations is that, even if a certain system X was determined to be the best moral and legal fit, it could still be the case that practical issues make X an unrealistic or unappealing goal. Here are some practical considerations, in no particular order.

DNA databases may be good and beneficial from the perspectives of moral and legal theory, but they still depend on human management and that carries the risk of human error. The collection of DNA samples has to be uncontaminated, stored in sterile conditions, and correctly matched with the donor. DNA profiling analysis is much less subjective nowadays with the use of STRs, but there could still be mistakes. DNA database profiles must be carefully stored to avoid loss of data and to ensure correct match-up between the DNA profile and the individual. It is also possible for criminals to fake their DNA. The encouraging side to this type of practical consideration is that the risk of these human error problems can be reduced by proper training and good management and organization techniques. Plus, as DNA profiling methods become more sophisticated, the technique could become much more automated and machine managed, although this does not necessarily mean the system would be free from errors.

Besides human mistakes, DNA databases are also vulnerable to exploitation and tyranny. Privacy is, obviously, a major concern when it comes to DNA profiling and databases. Although current profiling techniques use junk DNA to avoid revealing personal genetic information, the risk of this happening is still present. When the state or government collects a DNA sample, they collect the ability to potentially completely sequence an individual's genome. Earlier it was argued that if the original sample of DNA was discarded after the DNA profile was made, the ethical consideration of privacy problem would be side-stepped. The practical consideration of

this problem makes no such assumptions for how the system should theoretically work. Of course there are regulations in place to prevent this from happening, but it is neither inconceivable nor unheard of for governments to collect data surreptitiously. In a worst case scenario, the government could create biobanks of genetic information such as tendency towards aggression, addictive personalities, medical histories, and racial or sexual profiling.

Considerations such as these might come off as less practical and more paranoid, or at the very least reflect mistrust in the government to properly regulate sensitive institutions. Nevertheless, these are practical considerations. If mistrust towards the government is strong, it will affect the feasibility of certain ideas, regardless of whether that mistrust is well founded or not.

Most of these practical considerations could apply to offender and arrestee databases as well as universal DNA databases. Furthermore, these issues are all ones that become riskier at the level of a universal index. Understanding that these considerations are all facts of the matter or worries about possible states of affairs and are not themselves moral issues (in the way justice or privacy are) is important. The concern that a human error in DNA profiling might lead to identification mistakes is not itself a moral concern; it is the result of this idea that is morally relevant, for it would be a failure of justice. The practical consideration is of the true fact that there exists the possibility for human error. This in turn affects the ethical considerations, because the truth of the practical consideration could lead to an unwanted result. It does not have to be the case that the practical consideration is of some true fact. A practical consideration could be false, or unlikely, or ridiculous, but if it is widely believed or hard to understand this affects whether pursuing that issue is good or naive or not worth it.

Having examined the legal and practical considerations, some further tentative conclusions can be made. With legal considerations, the question of which scopes of DNA

databases are legal or preferable is somewhat indecipherable. Under some legal considerations, all DNA databases are problematic. However there are other laws and precedents that allow for offender, and sometimes arrestee, databases. There is no legal framework currently that promotes the idea of a universal DNA database. With practical considerations, DNA databases in general become less appealing due to actual or perceived risks that make their implementation and management seem problematic and even detrimental. Universal DNA databases in particular seem to suffer from practical considerations.

### **Part III – Answers and Conclusions**

How then to answer the question “Should there be a universal DNA database?” The ethical, legal, and practical considerations led to disparate conclusions on the matter. From a purely ethical perspective, there are strong (but not incontrovertible) reasons to believe a universal DNA database is the best idea. In theory, a universal database would promote a lot of moral benefits, although it might do so at the expense of some privacy considerations. Legally, a universal database is unjustifiable. This is somewhat ironic because theoretically a universal database would be particularly useful to the practice of law. Practical considerations greatly weaken the case for universal DNA databases because they bring out social issues that limit the feasibility and advantages of such a system.

Such an apparent impasse was anticipated, and earlier in the paper a strategy was proposed to find a way to balance between the competing interests to find the “most good” solution. But now, facing the problem, the proposed strategy seems quaintly optimistic. However, I think there is a way for me to answer the question, but I also do not think it is going to be very satisfying.

There are many issues that affect the calculation of whether a universal DNA database is a good idea. As I also mentioned before, I feel this problem is essentially a moral one. This is not just due to my subjective preference for ethical considerations. Rather, I think that the moral considerations are necessary to answering this question in a way that the legal and practical considerations are not. By “necessary” I am speaking of a technical, logical necessity. If the conclusions had turned out differently, where universal DNA databases had negative moral implications but were fine from legal and practical perspectives, I would not take that to be a strong argument in favor of adopting them. Since universal DNA databases not only pass but win from an ethical perspective, this goes a long way towards convincing me that universal databases are a good idea. That universal DNA databases are not supported by legal and practical considerations suggests to me that those kinds of laws and social facts have just not caught up with the ideal moral standard. To make an argument by analogy, I would want to always argue that the institution of slavery is wrong, even though it might be the case that contemporary laws and practical considerations make the abolishment of slavery seem unlikely.

That being said, just because I am inclined to answer “Yes” to the question of whether there should be a universal DNA database, it does not follow that I think it would be a good idea to adopt such a system right now. Legal and practical considerations do matter after all and should not be disregarded. With that in mind, I want to qualify my answer. Should there be a universal DNA database? Yes. Should there be a universal DNA database right now? No.

This might seem like an unsatisfying answer, or perhaps like cheating. In response to that I would like to suggest that the difficulty I have encountered in answer this question is a good thing. It has encouraged me to reconsider my positions on the modern system of law enforcement and has brought me to appreciate the value of this issue. And I’m not disappointed that I could

not make a strong, objectively valid conclusion. If such a thing existed, it would take all the fun out of philosophy.

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