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# FORENSIC USE OF DNA INFORMATION v HUMAN RIGHTS AND PRIVACY CHALLENGES

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## I INTRODUCTION

The use of scientific genetic-based evidence (DNA profiling)<sup>1</sup> in legal case investigation processes brings into collaboration the disciplines of science and law, which have their own institutional needs, standards and imperatives. The combination of these two disciplines is broadly geared toward ensuring justice for various cases, without completing retaining and relinquishing their autonomy.<sup>2</sup> Recent scientific advances through DNA technology play an important role in providing legal protections<sup>3</sup> and the preservation of law and order. The widespread use of DNA data to detect offenders and protect the rights of the innocent (that is, exonerating the wrongly-accused)<sup>4</sup> is one of the most notable examples of such advancements and revolutionary impact of DNA technology, which makes the justice delivery system more efficient and accurate.<sup>5</sup> However, the use of this new technology is not

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<sup>1</sup> It is also known as 'DNA Fingerprinting' or 'DNA Typing'.

<sup>2</sup> Sheila Jasanoff, 'Just Evidence: The Limits of Science in the Legal Process' (2006) 34 *Journal of Law, Medicine and Ethics* 328, 329.

<sup>3</sup> Leigh M Harlan, 'When Privacy Fails: Invoking a Property Paradigm to Mandate the Destruction of DNA Samples' (2004-05) 54 *Duke Law Journal* 179, 179. The same article points out that '[y]et current law, which fails to mandate the destruction of voluntarily provided DNA samples, falls well short of providing genetic privacy to innocent individuals', see Harlan: at 180 (citation omitted).

<sup>4</sup> Helen Wallace, *Prejudice, Stigma and DNA Databases* (July 2008) Council for Responsible Genetics, <[http://www.councilforresponsiblegenetics.org/pageDocuments/PDA\\_FXSTDPX.pdf](http://www.councilforresponsiblegenetics.org/pageDocuments/PDA_FXSTDPX.pdf)>. For 'an extract' of this full paper see Helen Wallace, 'Prejudice, Stigma and DNA Databases' (2008) 21(3-4) *eMagazine: GeneWatch* <<http://www.councilforresponsiblegenetics.org/GeneWatch/GeneWatchPage.aspx?pageId=60&archive=yes>>. See also UK Home Office, 'Keeping the Right People on the DNA Database: Science and Public Protection' (2009) 60; Liz Campbell, 'A Rights-Based Analysis of DNA Retention: "Non-Conviction" Databases and the Liberal State' (2010) (12) *Criminal Law Review* 889, 889.

<sup>5</sup> Harlan, above n 3.

completely risk free. DNA profiling may reveal very sensitive information about an individual and their family which may affect them adversely if not properly guarded against potential misuse – accidental or deliberate. The most common form of such misuse resulting in serious violation of privacy and human rights could be unauthorised disclosure of sensitive information with regard to a person's predisposition to disease and their ancestry, for instance, which can be obtained from their DNA samples. Therefore, it is important to adopt a balanced approach in the use of DNA information, so the risk of the violation of privacy and human rights remain at an acceptable level.

The identification of offenders and the protection of innocent suspects are two of the main goals for ensuring justice.<sup>6</sup> DNA samples and profiles are very useful for identification purposes, for example, in identifying victims of disasters, as well as suspects (including rapists and murderers). It is also useful for conducting parentage testing and for resolving immigration cases, where a familial relationship (or identity) is in question.<sup>7</sup> In many instances, suspects who are actually innocent are relatively quickly acquitted or excluded from legal proceedings. This technology is, in effect, upholding the principles of 'presumption of innocence', which requires that 'guilt must be proved beyond reasonable doubt', upon which each and every criminal justice system is based. Therefore, every accused person irrespective of his or her status has a right to a fair trial. This legal right even applies to those who have been convicted of similar offences committed in the past.<sup>8</sup> The right of a 'fair trial' is derived from the principles of natural justice. This right has also become the norm of international and regional human rights law<sup>9</sup> and it is also adopted by many countries in

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<sup>6</sup> George Clarke and Janet Reno, *Justice and Science: Trials and Triumphs of DNA Evidence* (Rutgers University Press, 2007) Foreword by Janet Reno, ix.

<sup>7</sup> US Department of Energy Genome Programs, *Human Genome Project Information, DNA Forensics* (16 June 2009) Genomics.energy.gov <[http://www.ornl.gov/sci/techresources/Human\\_Genome/elsi/forensics.shtml](http://www.ornl.gov/sci/techresources/Human_Genome/elsi/forensics.shtml)>. For the Australian experience see, eg, Australian Law Reform Commission, *Essentially Yours: The Protection of Human Genetic Information in Australia*, Report No 96 (2003) vol 2, 935–37[37.12], [37.17].

<sup>8</sup> Tania Simoncelli, 'Dangerous Excursions: The Case Against Expanding Forensic DNA Databases to Innocent Person' (2006) 34 *Journal of Law, Medicine and Ethics* 390, 390.

<sup>9</sup> *Universal Declaration of Human Rights*, GA Res 217A (III), UN GOAR, 3<sup>rd</sup> sess, 183<sup>rd</sup> plen mtg, UN Doc A/810 (10 December 1948) ('UDHR'), art 10 provides that 'everyone is entitled in full equality to fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations of any criminal charge against him'; art 14 of the *International Covenant on Civil and Political Rights*, opened for signature 16 December 1966, 99 UNTS 171 (entered into force 23 March 1976) ('ICCPR') reaffirmed the objects of UDHR and provides that 'everyone shall be entitled to a fair and public hearing by a competent, independent and impartial tribunal established by law.' See also *European Convention for the Protection of Human Rights and Fundamental Freedoms*, opened

their procedural law, though the form and practice of the principles of natural justice may vary from system to system on the basis of prevailing conditions of the society concerned.<sup>10</sup> This is one of the fundamental canons of modern democracy and is reflected in legal jurisprudence throughout the world. With the support of DNA technology, the right for a fair trial has been enhanced and it has also contributed to the speedier administration of justice.<sup>11</sup>

During the mid-1980s, the potential application of DNA typing or profiling was initiated by laboratories in the United Kingdom (UK), the United States (US), and Canada.<sup>12</sup> The modern forensic DNA typing invented by Professor Alec Jeffrey was first used in the *Colin Pitchfork case* in 1985 in the UK.<sup>13</sup> This was the first criminal case in which DNA was used in the UK and the resolution of this case provided an effective demonstration of this method's potential. It also demonstrated for the first time how a small DNA sample could be used to identify a perpetrator from amongst a large population.<sup>14</sup> By the late 1980s the technology was being used in the US by commercial laboratories and the Federal Bureau of Investigation (FBI). The pioneering *Colin Pitchfork case* and the rapid development of DNA technology databases firmly pointed toward the future of DNA profiling as the most important forensic investigative tool to be developed in the 20<sup>th</sup> century.<sup>15</sup> Within relatively few decades, DNA technology became commonly used in the investigative processes of many countries (including both developed and developing nations). However, the forensic use of DNA data is always subject to particular scrutiny not only because of its potential benefits in a justice delivery system but also due to the risk of possible misuse.

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for signature 4 November 1950 213 UNTS 222 (entered into force 3 September 1953) ('ECHR'), art 6, which also has a provision about right to a fair trial.

<sup>10</sup> Neeraj Tiwari, 'Fair Trial vis-à-vis Criminal Justice Administration: A Critical Study of Indian Criminal Justice System' (April 2010) 2(4) *Journal of Law and Conflict Resolution* 66, 66.

<sup>11</sup> 'Genetic Analysis System Boosts Criminal Justice', above n 7.

<sup>12</sup> Committee on DNA Technology in Forensic Science et al, *DNA Technology in Forensic Science* (National Academy Press, 1992) 28.

<sup>13</sup> *R v Pitchfork*, Case No: 2008/04629/A1, EWCA Crim 963 (14 May 2009). See also, Jay D Aronson, 'DNA Fingerprinting on Trial: The Dramatic Early History of A New Forensic Technique' (2005) 29(3) *Endeavour* 126, 128; Alan Gunn, *Essential Forensic Biology* (John Wiley and Sons, 2<sup>nd</sup> ed, 2009) 86, 92.

<sup>14</sup> Peter Gill, 'DNA as Evidence — The Technology of Identification' (2005) 352(26) *The New England Journal of Medicine* 2669, 2669.

<sup>15</sup> Peter Gill and John Buckleton, 'Biological Basis for DNA Evidence' in John S Buckleton, Christopher M Triggs and Simon J Walsh (eds), *Forensic DNA Evidence Interpretation* (CRC Press, 2005) 1, 2.

The following sections will address and discuss the issues with regards to human rights and privacy challenges in the context of forensic use of DNA or genetic information. While using such information in criminal or civil case investigations is useful, the issues of human rights and privacy need to be balanced with public interest or state security measures.

## II USE OF DNA INFORMATION IN THE JUSTICE DELIVERY SYSTEM: HUMAN RIGHTS AND PRIVACY CHALLENGES

It is well recognised that genetic science is one of the most dependable sources of truth, particularly in disputes concerning human identity. Sheila Jasanoff has rightly pointed out that ‘Genetic science produces truthful facts about human identity, and that establishing the truth in matters of identity is equivalent to ensuring justice.’<sup>16</sup>

As a result, DNA profiling or ‘fingerprinting’ is increasingly used for human identification in the legal proceedings of many nations.<sup>17</sup> Forensic DNA technology is used to analyse DNA profiles which normally originate from human DNA samples. These samples could be collected either from the crime scenes or from the body of suspects or victims. Then DNA profiles (that is, the analysed results of the DNA samples collected) are compared with previously stored profiles in the DNA database to locate matches. The forensic use of DNA samples and profiles has, therefore, enhanced the success of civil as well as criminal investigations and the process has already proved to be a valuable tool for delivering a speedy trial and justice. Recognising the potential of DNA Technology, in the case of *People v Wesley*<sup>18</sup> it was observed that ‘DNA Typing is the single greatest advance in the “search for truth” ... since the advent of cross-examination’.<sup>19</sup>

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<sup>16</sup> Jasanoff, above n 2, 332.

<sup>17</sup> Richard Hindmarsh and Barbara Prainsack, ‘Introducing Genetic Suspects’ in Richard Hindmarsh and Barbara Prainsack (eds), *Genetic Suspects: Global Governance of Forensic DNA Profiling and Databasing* (Cambridge University Press, 2010) 1, 1-2; see also Lawrence F Kobilinsky, Thomas F Liotti and Jamel Oeser-Sweat, *DNA: Forensic and Legal Applications* (John Wiley and Sons, 2005) xiii; Ian Freckelton, ‘DNA Profiling: A Legal Perspective’ in J Robertson, AM Ross and 1990) LA Burgoyne (CRC Press (eds), *DNA in Forensic Science: Theory, Techniques and Applications* (CRC Press, 1990) 156-7.

<sup>18</sup> 198 3d 519 (Cal App, 1988).

<sup>19</sup> *People v Wesley* 198 3d 519 (Cal App, 1988) (Joseph Harris J), cited in C Thomas Blair, ‘Spencer v Commonwealth and Recent Developments in the Admissibility of DNA Fingerprint Evidence’ (1990) 76 *Virginia Law Journal* 853, 853; see also Stephen M Patton, ‘DNA Fingerprinting: The Castro Case’ (1990) 3 *Harvard Journal of Law and Technology* 223, 223.

Now countries are establishing and expanding human DNA databases<sup>20</sup> for their use in civil and criminal intelligence with such bases 'ranging in size from a few hundred to a few million samples'.<sup>21</sup> DNA databases are, therefore, an extraordinary resource for forensic evidence.<sup>22</sup> Use of DNA profiling by law enforcement agencies was initially justified for identifying rapists, murderers and other heinous offenders, but it has gradually been expanded to involve suspects of various other crimes. Since the events of 9/11 in the US, law enforcement agencies around the world have expanded their areas of investigation and the techniques used. The expansion and use of forensic DNA databases has also been justified on the basis of the threat of terrorism. However, there are several ethical objections to such uses. The implications to society have been raised because of extensive uses of human DNA data and DNA databases.

### *A Human Rights and Privacy Objections*

Several objections with regard to the forensic use of DNA databases have been raised, and most of these objections are connected with the collection, retention, access and use of DNA samples that are the basis of DNA profiles.<sup>23</sup> Many forensic DNA databases retain DNA samples from various persons, including people, who have been acquitted after the conclusion of judicial proceedings, or where the charges were dropped or not proceeded with, or even where the samples are from persons excluded from investigation by that very sample. When DNA samples are kept and retained in any databases, it is possible to gather the most personal information about any individual (including his or her family) with regard to certain characteristics, including predisposition to certain diseases.<sup>24</sup> This is because '[g]enes are considered to be good predictors of many facets of human identity'.<sup>25</sup> They can indicate human physical traits (for example, eye colour) and a predisposition to certain diseases (for example, heart disease, inherited

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<sup>20</sup> Currently '56 countries worldwide operate national DNA databases from Asia to Europe and the Americas': Andrew D Thibedeau, 'National Forensic DNA Databases' (Council for Responsible Genetics, 2011) 15.

<sup>21</sup> Tania Simoncelli and Helen Wallace, 'Expanding Databases, Declining Liberties' (2006) 19(1) *Genewatch: A Bulletin of the Committee for Responsible Genetics* <<http://www.councilforresponsiblegenetics.org/GeneWatch/GeneWatchPage.aspx?pageId=191&archive=yes>>.

<sup>22</sup> Simoncelli, 'Dangerous Excursions', above n 8, 393.

<sup>23</sup> Annemie Patyn and Kris Dierickx, 'Forensic DNA Databases: Genetic Testing As a Societal Choice' (2010) 36 *Journal of Medical Ethics* 319, 319.

<sup>24</sup> Robin Williams and Paul Johnson, 'Inclusiveness, Effectiveness and Intrusiveness: Issues in the Developing Uses of DNA Profiling in Support of Criminal Investigations' (2005) 33(3) *Journal of Law, Medicine and Ethics* 545, 551.

<sup>25</sup> Jasanoff, above n 2, 337.

breast cancer). An examination of DNA samples can also detect genetic conditions that affect intelligence (for example, phenylketonuria) but sometimes not the degree to which a genetic condition may manifest itself (for example, Down Syndrome). It can also indicate a predisposition to certain mental illnesses (such as schizophrenia). Some researchers believe that DNA contains information regarding 'a series of behavioural characteristics, ranging from thrill-seeking<sup>26</sup> to aggression'<sup>27</sup> and 'the propensity for aggressive, addictive, or criminal behaviors'.<sup>28</sup> A number of authors and researchers, however, dispute the claims made in regard to the usefulness of DNA samples as predictive of such behaviours (rather than associated in some instances with certain behaviours), and point to the complex interactions of genetics and environment.<sup>29</sup> In addition, it is also 'well recognised that DNA contains information regarding familial lineage'<sup>30</sup> or pedigree. Such sensitive data has raised concerns for individual and familial privacy. As Simoncelli has observed:

DNA data banks pose a number of significant individual privacy concerns ... Unlike fingerprints ... DNA samples can provide insights into personal family relationships, disease predisposition, physical attributes, and ancestry. Such information could be used in sinister ways and may include things the person herself does not wish to know. Repeated claims that human behaviors such as aggression, substance addiction, criminal tendency, and sexual orientation can be explained by genetics render law enforcement databases especially prone to abuse.<sup>31</sup>

Further the DNA identification of a suspect can potentially bring police officers to the doors of his or her relatives to ask questions about their genetic relationship to the offender (or arrestee) and their whereabouts

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<sup>26</sup> N Angier, 'Variant Gene Tied to a Love of New Thrills', *New York Times* 2 January 1996 A1, cited in Jasanoff, above n 2, 337.

<sup>27</sup> Virginia Morell, 'Evidence Found for a Possible 'Aggression Gene'' (1993) 260 *Science* 1722, 1722-3; see also R W Stevenson, 'Researchers see Gene Link to Violence but Are Wary', *New York Times* 9 February 1995, cited in Jasanoff, above n 2, 337.

<sup>28</sup> Fred W Drobner, 'DNA Dragnets: Constitutional Aspects of Mass DNA Identification Testing' (2000) 28 *Capital University Law Review* 479, 479-80, cited in Harlan, above n 3, 181.

<sup>29</sup> Avi G Haimowitz, *Heredity Versus Environment: Twin, Adoption, and Family Studies* (24 November 2011) Rochester Institute of Technology (RIT) <<http://www.personalityresearch.org/papers/haimowitz.html>>; see also Samantha P Lumbert, *Addictive Behaviors: Heredity or Environment?* (24 November 2011) Rochester Institute of Technology (RIT) <<http://www.personalityresearch.org/papers/haimowitz.html>>.

<sup>30</sup> Drobner, above n 28, cited in Harlan, above n 3, 181.

<sup>31</sup> Simoncelli, 'Dangerous Excursions', above n 8, 391-2.

at the time of the crime.<sup>32</sup> An even more striking intrusion of privacy is when law enforcement agencies directly interrogate a suspect's family members, very often to request their DNA.<sup>33</sup> This has some obvious societal as well as practical implications. For instance, it can potentially destroy a person's marital life, disrupt his or her career, or even ruin his or her whole life. In this regard Sonia M Suter has rightly pointed out:

All of these actions imply that the relative is a suspect or, at least, a person of interest, which itself can be threatening, intimidating, and intrusive. At best, such an investigation is a hassle or form of harassment. At worst, it violates the relative's privacy interests by subjecting them to a "lifetime [of] genetic surveillance".<sup>34</sup>

There are some important uses of DNA by the law enforcement and judicial proceedings, but it is also true that neither law enforcement nor the courts adequately consider the full extent of the privacy threats posed by DNA profiling.<sup>35</sup>

Further, the 'forced or non-consensual' collection of DNA samples from individuals constitutes a possible threat to bodily integrity.<sup>36</sup> The potential further use of DNA data stored in DNA databases constitutes a potential threat to bodily integrity and genetic privacy. Rules and policies concerning DNA sample collection, entry and removal criteria of DNA samples on a database generally, as well as the placement and retention of profiles on forensic DNA databases, specifically imply some more ethical challenges.<sup>37</sup> In general, ethical issues surrounding obtaining DNA data focuses on the concept of 'informed consent'.<sup>38</sup>

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<sup>32</sup> Sonia M Suter, 'All in the Family: Privacy and DNA Familial Searching' (Spring 2010) 23(2) *Harvard Journal of Law and Technology* 310, 349.

<sup>33</sup> Ibid 352. See also Daniel J Grimm, 'The Demographics of Genetic Surveillance: Familial DNA Testing and the Hispanic Community' (2007) 107 *Columbia Law Review* 1164, 1164-6.

<sup>34</sup> Suter, above n 32, 350. See also Frederick R Bieber, Charles H Brenner and David Lazer, 'Finding Criminals Through DNA of Their Relatives' (2006) 312 *Science* 1315, 1316.

<sup>35</sup> Suter, above n 32, 312.

<sup>36</sup> Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness' above n 24, 546.

<sup>37</sup> Helena Machado and Susana Silva, 'Informed Consent in Forensic DNA Databases: Volunteering, Constructions of Risk and Identity Categorization' (2009) 4 *BioSocieties* 335, 336.

<sup>38</sup> In this regard, Amy Harmon points to a recent episode which she asserts demonstrates a clear violation of the informed consent issue. Harmon describes the case of the Havasupai tribe of Arizona stating: 'members of the tiny, isolated tribe had given their DNA samples to [Arizona State] University researchers starting in 1990, [for the express purpose of looking for] genetic clues to the tribe's devastating rate of diabetes. But they learned that their blood samples had been used to study many other things, including mental illness and theories of the tribe's geographical origins that contradict their traditional stories': Amy Harmon, 'Indian Tribe Wins Fight to Limit Research of Its DNA', *The New York Times* (online) 21 April 2010 <<http://www.nytimes.com/2010/04/>

Upon obtaining fully informed consent, taking and storing DNA data is no longer unethical. There are some instances where subsequent access by a third party has been permitted, where the question of ethics appears to have been ignored, such as where a DNA profile of a suspect is uploaded onto a national forensic DNA database, and access to this database (including that suspect's profile) is later given by police to another government agency for studying behavioural genetics. Such access and use, however, is justified only with 'free and informed consent' of the sample provider. Such use is also granted only for the purposes it was originally collected. In this regard, some could argue that convicted persons have fewer civil rights; however innocent donors or suspects, who are later acquitted, do not lose their right to informed consent, and they should have a legitimate claim before a court of law.<sup>39</sup> This is, of course, contingent upon whether the consent given is fully informed or not, as this is required to make the decision. Some additional ethical issues associated with informed consent include: what 'informed' truly indicates, and how to ensure that the consent provider is actually informed.<sup>40</sup> Further, it is very often argued that for the future collective well-being of society or public good, individuals' should provide their DNA samples. Rules and practices of informed consent, therefore, supply a framework for what has become a moral duty for citizens, that is, to comply with technical interventions for the sake of the administration of justice. However, little attention has been paid to the duties of the management or custodians of forensic DNA databases<sup>41</sup> with regards to the protection of sample providers' rights.

As well as for law enforcement purposes, DNA information is also being used for statistical, educational and medical research purposes.<sup>42</sup>

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22/us/22dna.html?ref=general&src=me&pagewanted=print>. In this case, researchers and institutions are required to obtain "informed consent" from sample providers, ensuring that they understand the risks and benefits before they participate. It is also interesting to note that in the case of *R v Dymnt* [1988] 2 SCR 417, [38], Justice La Forest (Dickson CJ concurring) of the Supreme Court of Canada maintained that the 'use of a person's body without his consent to obtain information about him invades an area of privacy essential to the maintenance of his human dignity': as cited in Bartha Maria Knoppers and Claude Laberge, 'DNA Sampling and Informed Consent' (1989) 140 *Canadian Medical Association Journal* 1023, 1023.

<sup>39</sup> Council for Responsible Genetics, *Forensic DNA Collection: A Citizen's Guide to Your Rights Scenarios and Responses* (18 June 2011)

<<http://www.councilforresponsiblegenetics.org/pageDocuments/I6W7Q3D7RM.pdf>>.

<sup>40</sup> Nicholas Dufour et al, *DNA Fingerprinting* (Degree of Bachelor of Science Thesis, Worcester Polytechnic Institute, 27 August 2008) 73-4.

<sup>41</sup> Garrath Williams and Doris Schroeder, 'Human Genetic Banking: Altruism, Benefit and Consent' (2004) 23 *New Genetics and Society* 89, 90, 100.

<sup>42</sup> Mark A Rothstein and K Talbott Meagher, 'The Expanding Use of DNA in Law Enforcement: What Role for Privacy?' (2006) 34(2) *Journal of Law, Medicine and Ethics* 153, 159.



Consequently, a group of individuals, corporations, and agencies are interested in such sensitive information about the human body.<sup>43</sup> Release of this sensitive genetic information could have some far-reaching familial and social implications. It could, for example, influence placement decisions by adoption agencies or allow prospective spouses to select their mates based on perceived genetic advantage and so on. It could also give rise to discrimination against and stigmatisation of an individual or groups. Moreover, such biological information could give rise to another class in society: a 'genetic minority' or an underclass of those perceived as genetically inferior. This could mean that solely on the basis of biological information, society could discriminate against individuals deemed 'substandard' subjecting such persons to custodial arrangements or to specific eugenic measures designed to eliminate those whose DNA manifested the undesirable trait.<sup>44</sup> Such measures could include compulsory sterilisation of those of reproductive age, and compulsory pre-conception or pre-implantation testing, or termination of foetuses conceived with the undesirable DNA trait. This could theoretically occur even though it is a mere prediction or a possibility, not a certainty, that some undesired trait or characteristics may be manifested in them.<sup>45</sup>

In some jurisdictions, human rights and privacy objections are sometimes overlooked by stressing that the collection and use of DNA data are very useful for maintaining law and order.<sup>46</sup> Many DNA databases around the world retain DNA samples, including those of innocent suspects, for a period of time even after finishing the

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<sup>43</sup> Harlan, above n 3, 181.

<sup>44</sup> '[B]y the late 1930s, Hitler's eugenic-based national program of "race hygiene" had escalated into a program of euthanasia targeting both children and adults with various mental and physical disorders. This policy eventually culminated in the deaths of millions of Jews during the Holocaust': Karen Norrgard, 'Human Testing, the Eugenics Movement, and IRBs' (2008) 1(1) *Nature Education* <<http://www.nature.com/scitable/topicpage/human-testing-the-eugenics-movement-and-irbs-724>>. Moreover, 'During World War II, a number of German physicians conducted painful and often deadly experiments on thousands of concentration camp prisoners without their consent': Holocaust Encyclopedia, *Nazi Medical Experiments* (6 January 2011) United States Holocaust Memorial Museum <<http://www.ushmm.org/wlc/en/article.php?ModuleId=10005168>>. See generally Laura Hix, *Modern Eugenics: Building a Better Person?* (22 July 2009) Science in Society <<http://scienceinsociety.northwestern.edu/content/articles/2009/research-digest/eugenics/modern-eugenics-building-a-better-person>>.

<sup>45</sup> Harlan, above n 3, 182.

<sup>46</sup> Nuffield Council on Bioethics noted that, '[d]eviation from [the ethical values] can be justified in various ways, most notably by invoking the public interest in general': Nuffield Council on Bioethics, 'The Forensic Use of Bioinformation: Ethical Issues' (Nuffield Council on Bioethics, 2007) 31.

investigation. The main justification for such retention is that persons who later commit more crimes can be identified and apprehended quickly.<sup>47</sup> Indefinite retention of DNA data collected from suspects and other individuals has given rise to questions about privacy rights. In the case of *S and Marper v the UK*,<sup>48</sup> S and Marper claimed that retention of their DNA samples and profiles interfered with their right to respect for private life because this sensitive information is linked to their personal identity. They argued that such types of information should be kept within their control. The Administrative Court rejected their application and an appeal to the UK House of Lords was also dismissed.<sup>49</sup> Lord Steyn concluded that the mere retention of fingerprints and DNA samples did not constitute any interference with private life and it was proportionate to what was necessary for detection investigation and prosecution of crime.<sup>50</sup> UK legislation does not require the destruction of DNA samples and they may be retained even after fulfilment of the purpose for which they have been collected.<sup>51</sup> Finally, however, on appeal to the European Court of Human Rights (ECtHR), the Court ruled that the 'blanket and indiscriminate nature of the powers of retention of the fingerprints, cellular samples and DNA profiles of persons suspected but not convicted of offences' violates the right to respect for private and family life.<sup>52</sup> The case pioneered developments in this field. The rules it recommended be adopted and the procedures it advised to be followed have been of considerable influence in other contexts around the world. Although the ECtHR provided its ruling protecting human rights and privacy in 2008, at this stage, it is essential to analyse how many national jurisdictions (including the UK) have taken appropriate measures in pursuit of the principle and rule set forth by this judgment.

DNA samples are a potential source of human genetic information and can reveal sensitive health information. It can, therefore, violate bodily integrity, privacy (information concerning health, familial relationships and so on) and facilitate discrimination against people and have other social consequences.<sup>53</sup> At the same time, while addressing human rights and privacy issues and also to ensure proper use of DNA data,

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<sup>47</sup> Gill, 'DNA as Evidence', above n 14.

<sup>48</sup> *S and Marper v United Kingdom* (European Court of Human Rights, Grand Chamber, Application Nos 30562/04 and 30566/04, 4 December 2008).

<sup>49</sup> *Ibid* [12], [15].

<sup>50</sup> *Ibid* [19], [21].

<sup>51</sup> *Police and Criminal Evidence Act 1984* (UK) c 60, s 64(1A) ('PACE Act').

<sup>52</sup> *S* (Eur Court HR, Grand Chamber, Application Nos 30562/04 and 30566/04, 4 December 2008) [125]-[126].

<sup>53</sup> Patyn and Dierickx, above n 23.

some gaps (financial, technological, cultural and social) possibly exist between developed and developing countries that need also to be addressed. The following section will determine the extent to which human rights and genetic privacy are protected in existing justice delivery systems.

### *B How Far Are Our Human Rights and Privacy Protected?*

In relation to human identification issues, the freedom or liberty, secrecy, autonomy and privacy interest of individuals are highly connected. At present, addresses, telephone numbers, social security numbers, credit ratings, range of incomes, demographic categories, and information on hobbies of many individuals in a particular society are currently available from various computerised data sources.<sup>54</sup> Even such simple information about human identity requires confidentiality to avoid unwarranted intrusions into people's lives (for example, advertisers cross-matching income and purchase patterns to target prospects).

More detailed information related to identity would require additional security. As with fingerprint files and other personal identity related data, DNA samples and profiles could be used to search and correlate criminal and/ or medical record databases. However, such samples and profiles are far more revealing than are fingerprints. The collection and storage of materials and profiles in the latter database is also not usually associated with consent for such a purpose. Computer storage of DNA information therefore increases the possibilities for further misuse, in particular the violation of privacy.

DNA profiling, in principle, has the potential to provide personal information – such as medical characteristics, physical traits, and consanguinity – that carries with it risks of discrimination. For instance, the Committee on DNA Technology in Forensic Science mentioned that the forensic restriction fragment length polymorphism (RELP) typing markers<sup>55</sup> are not known to be associated with particular traits or medical conditions, but there is a possibility that they might be used in the future. The current Polymerase Chain

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<sup>54</sup> Committee on DNA Technology in Forensic Science, above n 12, 114–15.

<sup>55</sup> The Restriction Fragment Length Polymorphism (RFLP) is a technique that was used for the first time in the world in the 1980s by the British biologist, Professor Alec Jeffreys for DNA fingerprinting. The process of DNA fingerprinting involves extracting and cutting the DNA into small pieces of fragments of varying lengths. These are further analysed to reveal patterns in their occurrence (composition, location, length).

Reaction (PCR) typing<sup>56</sup> uses the human leucocyte antigen (HLA) DQ locus (area) in a gene that controls many important immunological functions and is associated with diseases.<sup>57</sup>

Consequently, DNA profiling has raised considerably greater issues of privacy than does ordinary fingerprinting.<sup>58</sup> In addition, potential privacy threats arise from the fact that the original DNA samples are generally retained as well as the DNA profiles held on the databases. Further information could be derived from those samples in future, or new technologies could lead to new information. One of the most important privacy concerns in the context of forensic use of DNA data is the collection and retention of powerful DNA information (that is, DNA sample and profiles) on a routine basis. In some cases, individuals are also coerced into providing DNA samples in 'dragnets' or a mass screening process.<sup>59</sup> Further, the relatives of some criminals or suspects are asked to provide their samples, but after the case is resolved, those original samples (from parties innocent in relation to the offence being investigated) are retained for an uncertain period of time for future use.<sup>60</sup> Privacy implications are also raised through the retention of DNA samples and profiles.

Once there is a crime committed, or there is a suspicion that one has been committed, law enforcement agencies require biological information from individuals for law enforcement purposes (such as in the identification of criminals, or missing persons, or in regard to an issue of parentage).<sup>61</sup> Very often they do so in connection with the investigation of a case.

Rothstein and Talbott Meagher, in their 2006 article, contrast the use of DNA testing and the simple drug testing of blood and saliva samples (the latter attracting less community anxiety than the former). In their example, police investigating a series of murder cases at pharmacies in a particular area found that all of the murders committed during a

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<sup>56</sup> PCR is a molecular biological technique through which a particular DNA sequence can be amplified or copied from a small amount of DNA. Newton and Graham has defined the term PCR as 'an *in vitro* technique which allows the amplification of a specific Deoxyribonucleic acid (DNA) region that lies between two regions of known DNA sequence', for further details see, CR Newton and A Graham, *PCR* (BIOS Scientific Publishers, 1994) 1.

<sup>57</sup> Committee on DNA Technology in Forensic Science, above n 12, 114-15.

<sup>58</sup> *Ibid* 113.

<sup>59</sup> This is the process through which police seek and collect DNA samples from the public to catch the guilty person.

<sup>60</sup> Rothstein and Meagher, above n 42, 160.

<sup>61</sup> See generally Michelle Hibbert, 'DNA Databanks: Law Enforcement's Greatest Surveillance Tool?' (1999) 34 *Wake Forest Law Review* 768, 787-9.

series of armed robberies had another feature in common, that is, that the thief was in the habit of stealing an expensive and relatively rare drug. From this information police speculated that the thief was dependent on a particular type of medicine. In fact, such information could also indicate that a near family member or other relative required this medication. As this was the only clue, in order to identify the actual offender, police could ask the people of that locality to undergo a blood or saliva test to detect the presence of that particular rare drug. Rothstein and Talbott Meagher argue that the drug test reveals more personal information (in regard to illness on the basis of the drug taken) than any current DNA test, but added that such drug testing lacks the specificity of a DNA test which would be able to identify the individual involved, if there was a sample left at the scene of the crime. Nevertheless the samples supplied in *any* mass screening (including blood or saliva for drug analysis) could be subsequently used for DNA analysis and divulge personal health and other information about all the individuals who have been tested. Even though they are innocent, their information as well as their personal details might be retained for an indefinite period on the forensic database. The test can reveal sensitive personal health information<sup>62</sup> which is vital for both the individual and his or her family. It is no wonder therefore, that some people object, usually without effect, to the submission of samples for DNA analysis.

An interesting example of how a DNA database may become a potential risk to human rights and privacy could be seen in the example of US *Social Security Act* passed in the early nineteen thirties. When the Act was passed in the US, the Congress stipulated that the social security number should not be used other than for the purpose envisioned in this Act. However, a considerable number of databases belonging to both public and private agencies, for example, drivers' licence issuing authorities and credit card companies, collected these numbers and used them for purposes other than what was originally indicated in the Act. Such use included providing the government with a permanent database about many of the activities of US citizens and covering every sphere of their life.<sup>63</sup> Later, this practice raised a number of significant privacy concerns. Similarly, many believe that easy access to DNA databases, which have even more sensitive data, may pose even more serious threat of privacy violation, and hence, it requires greater protection.

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<sup>62</sup> Rothstein and Meagher, above n 42, 160.

<sup>63</sup> E Donald Shapiro and Michelle L Weinberg, 'DNA Data Banking: The Dangerous Erosion of Privacy' (1990) 38 *Cleveland State Law Review* 455, 477.

The above discussion highlights a number of human rights and privacy violation issues in a number of contexts, which are ongoing in the existing DNA database practices and/or in the justice delivery systems. Some notable forms of privacy violations with regard to the forensic use of human DNA data, which are identified and considered significant by the author, are discussed below.

## 1 Retention of DNA Samples and Profiles

Cellular or DNA samples are retained for the purposes of possible later verification of a profile, or for correcting some error, for quality control purposes (as happens in the case of CODIS),<sup>64</sup> or for resolving subsequent disputes, and also for further research. The justification for this retention is also based on the necessity to facilitate any re-profiling that may become necessary 'if the current profiling methodologies change to include more loci or even shift more radically to new kinds of technological platforms' such as Single-Nucleotide Polymorphism (SNP)<sup>65</sup> (the process most likely to replace STR analysis used in the formation of DNA databases). However, retention of DNA samples and profiles for an unspecified period of time poses serious threats to individual or social privacy. Privacy violations can occur in two ways. The first is by interfering with a person's physical integrity (physical genetic privacy) to obtain a DNA sample. The second is by accessing those databases, which contain potentially much greater and more personal, sensitive and detailed information. For example, when DNA samples are kept and retained in any databases, it is possible to gather the most personal information about any individual (including his or her family) with regard to certain characteristics. This includes, the predisposition to certain diseases<sup>66</sup> and more information concerning individuals and their relatives than other forms of data such as fingerprints. The latter constitutes a breach of informational privacy.

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<sup>64</sup> R E Gaensslen, 'Should Biological Evidence or DNA be Retained by Forensic Science Laboratories After Profiling? No, Except Under Narrow Legislatively Stipulated Conditions' (2006) 34 *Journal of Law, Medicine & Ethics* 375, 377.

<sup>65</sup> P Gill and D J Werrett, 'An Assessment of Whether SNPs will Replace STRs in National DNA Databases' (2004) 44(1) *Science and Justice* 51 cited in Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24. SNP is the simplest type of polymorphism and it is single base difference in the sequence of the DNA. SNPs normally have just two alleles – one allele with a guanine (G) and one with an adenine (A), and therefore are not highly polymorphism. However, SNPs are so abundant throughout the genome that it is theoretically possible to type hundreds of them, which can make the combined power of discrimination very high. For further details see William Goodwin, Adrian Linacre and Sibte Hadi, *An Introduction to Forensic Genetics* (John Wiley and Sons, 2007) 13–14. See also Wilson Wall, *Genetics and DNA Technology: Legal Aspects* (Cavendish Publishing, 2<sup>nd</sup> ed, 2004) 57.

<sup>66</sup> Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24, 551.

The kind of knowledge in relation to someone's life, which is possible to gather from DNA samples, has no parallel in the history of science and technology, and it raises profound questions about the protection of human rights and privacy.<sup>67</sup> While evaluating the privacy implications, it is necessary to evaluate the challenges to the benefits of retention of DNA samples in databases.<sup>68</sup> Moreover, collection and storage of large quantities of biological samples by law enforcement agencies call for specific regulations controlling their fair use and terms of retention, which balance human rights and privacy protection.

## 2 *Unfettered Power Exercised by Police*

There is another ancillary or interconnected problem with regard to the retention of DNA samples and profiles. In relation to the use of these DNA databases, the UK police exercise some unfettered powers. Originally, under s 64 of the *Police and Criminal Evidence Act 1984* (UK) ('*PACE Act*') DNA samples had to be destroyed if a person was not charged or was acquitted. However, this section has been amended by s 57 of the *Criminal Justice and Public Order Act 1994* ('*CJPO Act*') and s 64(3A) of the *PACE Act*. For example, s 64(3A) of the *PACE Act* provides that samples need not be destroyed if samples 'were taken for the purposes of the investigation of an offence of which a person has been convicted'. As a result, the samples taken can be kept indefinitely. Further, s 82 (2) of the *Criminal Justice and Police Act* ('*CJP Act*') of 2001 amended s 57 of the *CJPO Act* and it allowed DNA samples to be retained and used for future investigations. That meant DNA samples could be retained even where charges were not proceeded with or were dropped.

Moreover, police access to human DNA data, which can identify individuals as well as contain personal information, has some obvious consequences in terms of a right to privacy.<sup>69</sup> For example, while 'many Australian jurisdictions expressly confine the police's use and disclosure of information obtained from forensic procedures to investigative purposes',<sup>70</sup> such police use and or disclosure of information has nevertheless been seen as 'encompass[ing] potentially broad intrusions into privacy'.<sup>71</sup>

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<sup>67</sup> *Ibid.*

<sup>68</sup> Yale H Yee, 'Criminal DNA Data Banks: Revolution For Law Enforcement or Threat to Individual Privacy?' (1995) 22 *American Journal of Criminal Law* 461, 480.

<sup>69</sup> Jeremy Gans, 'DNA Identification, Privacy and the Irrelevance of Australian Law' (2007) 3(9) *Privacy Law Bulletin* 110, 110.

<sup>70</sup> *Ibid* 111.

<sup>71</sup> *Ibid.*

Australian police can lawfully obtain a person's DNA profile without either a court order or consent. They can do so by collecting that person's body sample from an item the person has touched.<sup>72</sup> In addition, the collected DNA information — from suspects, criminals or other innocent persons by the police — could be later used to identify them in regard to subsequent activities where a sample is taken and found to match the original.<sup>73</sup>

Again, as Gans observes, if the police have obtained a known person's DNA profile and it is compared with all other profiles derived from crime scene samples,

then the police can potentially learn of any of the person's behaviour, criminal or innocent, or associated, accurately or not, with any crime, actual or apparent, at any time, past or future.<sup>74</sup>

This practice has the effect, in Australia, of all offenders and suspects whose DNA profile was obtained by the police, consensually or otherwise, facing loss of their privacy.<sup>75</sup> In the case of offenders, this is consistent with the rationale for DNA sampling because of the risk of recidivism. Moreover, since they are offenders, they should have reduced rights to privacy. On the other hand, in the case of suspects, privacy intrusion greatly exceeds the original purpose of the DNA sample. That means the DNA samples might be used for purposes other than in the investigation of the offence for which they were suspected of committing.

Furthermore, in Australia, DNA profiles from volunteers and even victims can also be used to identify suspects or offenders. Gans points out that while Australian statutes appear to provide for the use of samples volunteered only 'for the "purpose" for which the profile was volunteered'<sup>76</sup> nevertheless the people giving the sample may be asked not to so limit the use of the sample. Gans also notes an instance where

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<sup>72</sup> Ibid.

<sup>73</sup> Ibid 112.

<sup>74</sup> Ibid 111. Such behaviour may include staying in a hotel, driving a car while drunken, using a syringe, handling a weapon or having sex.

<sup>75</sup> Ibid.

<sup>76</sup> For example, see *Crimes Act 1914* (Cth) s23YDAF; *Crimes (Forensic Procedures) Act 2000* (ACT) s 97; *Crimes (Forensic Procedures) Act 2000* (NSW) s 83A, s 93; *Police Administration Act* (NT) s 147B(2) (matches to profiles relating to offences carrying a maximum penalty of less than fourteen years of imprisonment only); *Police Powers and Responsibilities Act 2000* (Qld) s 494(1)(a) & *Police Powers and Responsibilities Regulations 2000* (Qld) reg 8; *Criminal Law (Forensic Procedures) Act 2007* (SA) s 45(3)(a); *Forensic Procedures Act 2000* (Tas) s 54; *Crimes Act 1958* (Vic) s 464ZGI; *Criminal Investigation (Identifying People) Act 2002* (WA) pt 10.



victim DNA profile was used to assist identification of a relative for an unrelated offence.<sup>77</sup>

It is also important to recognise that the police in England and Wales are given extensive powers under section 64(1A) of the *PACE Act*<sup>78</sup> to retain DNA samples and data derived from suspects indefinitely. The implication of this is that the police are never required to destroy samples that they have legitimately collected.

In addition, DNA databanking could lead to an unprecedented and extremely powerful means of governmental intrusion into a citizen's most private sanctuary.<sup>79</sup> The power given to the law enforcement agencies could be misused either for political or other reasons. For instance, when DNA samples and/or information are in the custody of police, there is a possibility that such information could be used by the government other than for its original purposes.<sup>80</sup> The problem can be more acute for developing countries, where the judicial systems are not very well developed. There is also a high chance that corrupt practices might begin in the use of DNA database in those countries, such as manipulating innocent people, harassing the leaders of the opposition parties, and also making transactions with some interested third parties with regard to this highly sensitive information.

### *3 Issues with Regards to Informed Consent*

Another interconnected issue with regards to the power of the police is – the informed consent issue of sample providers (be they innocent volunteers, suspects or accused). In the investigative process, the collection and use of DNA samples without consent and/or forcibly collected from suspects also raises a question about the protection of the privacy of that person's interests. In this regard, it can be cited that there are two rules that exist in Australian jurisdictions. On the one hand, in some jurisdictions police have no power to compel someone to provide their DNA sample. In such circumstances, police have to rely purely on that person's consent to obtain their DNA.<sup>81</sup> On the other hand, in many Australian states police rely on consent even though they have the power to compel someone to cooperate in obtaining a sample of their DNA. However, as police have power to compel, 'many suspects or offenders explicitly told that a refusal to

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<sup>77</sup> Gans, above n 69.

<sup>78</sup> *PACE Act*; see also *CJP Act* s 82.

<sup>79</sup> Shapiro and Weinberg, above n 63, 479.

<sup>80</sup> Rothstein and Meagher, above n 42, 161.

<sup>81</sup> Gans, above n 69, 111.

consent may result in the use of force to carry out a subsequent DNA sampling order', inevitably comply with this request.<sup>82</sup> In this situation, a suspect's consent is not voluntary and free from undue pressure. Similarly, under the UK domestic legislation, if an individual is arrested in connection with a 'recordable' offence, the police can take fingerprints and biological samples at their discretion without the consent of the individual.<sup>83</sup> In such circumstances, it is also debatable as to whether informed consent from people can truly be taken freely in the police custody during an investigation, because refusal to give a sample immediately places a person under suspicion.<sup>84</sup>

#### 4 Controversy Regarding Familial Searching

Collection of DNA samples from close relatives, including children, as a means of locating a suspect creates another human rights and privacy issue. For the purpose of solving a case, 'familial searching'<sup>85</sup> is often conducted by the law enforcement agencies. The investigative benefits of this familial searching are apparent, but some obvious concerns are that a perhaps unexpected genetic link could be revealed from that searching. For example, the evidence from the 'familial search' might reveal that several people on the database are related to each other and also to the unknown suspect for the crime. In one notable US case, a familial search identified a perpetrator as the brother of a victim, who had submitted a sample in an unrelated case.<sup>86</sup> The genome speaks for itself. It tells the police that a particular person is the biological father or son or mother or sister of an offender or share in some degree of consanguinity, though they may have never met.<sup>87</sup> In other instances, testing reveals that a relationship (for example, father-son) as putative rather than actual, with serious personal ramifications for those involved.

In addition, there also exists a greater societal interest in maintaining and promoting intact, healthy family units. Family integrity and

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<sup>82</sup> *Ibid.*

<sup>83</sup> *CJA s 10(2)*.

<sup>84</sup> Helena Kennedy, 'We Should Be Outraged by these DNA Databases: A Labour Peer Condemns a New Government Assault on Civil Liberties', *The Guardian* (online) 14 May 2001 <<http://www.guardian.co.uk/education/2001/may/14/highereducation.uk>>.

<sup>85</sup> Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24, 553. Williams and Johnson defined the term "familial searching" as a reference 'to a form of database searching based on knowledge about the probability of matches between the STR markers of two members of the same family as opposed to the probability of matches between these markers when the individuals compared are unrelated'.

<sup>86</sup> *United States v Davis*, 657 F Supp 2d 630 (MD Ct, 2009).

<sup>87</sup> Erin Murphy, 'Relative Doubt: Familial Searches of DNA Databases' (2010) 109 *Michigan Law Review* 291, 318.

privacy is a cornerstone of human rights values. Thus, implicating family members in an investigation, where a relative (genetic or social) might be involved, is likely to have profound social, cultural and physical impacts on that family.<sup>88</sup> The investigation alone has the 'capacity to deepen painful rifts within strained familial bonds'.<sup>89</sup> Family members may have already suffered greatly as a result of the actions of a related convicted offender, such as, incurring financial losses as a result of legal costs or thefts, or emotional losses from incarceration, abandonment, or betrayal. Criminality can tear families apart, and when the state conducts investigations based primarily on familial links, it does so with the strong likelihood of inflicting further damage.<sup>90</sup> Even in families in which the offender's position is reconciled, familial searching effectively turns convicted offenders into involuntary 'genetic informants'.<sup>91</sup> It burdens the relationship between innocent relatives and the convicted offender as relatives to find themselves suspected of a crime they did not commit by virtue of nothing other than the biological connection.<sup>92</sup>

Information derived from DNA is much greater than that flowing from any other forensic tests, such as a fingerprint, and it presents a direct challenge to a basic right to privacy.<sup>93</sup> Though the prevention of crime is one of the fundamental duties of a state, it is also necessary to protect and respect some basic ethical values of its citizens, for example, privacy. Sometimes a suspect (though their crime is subsequently not proved beyond reasonable doubt) is forced to provide a DNA sample. In the national interest, sometimes it is essential to do so. At the same time, it is also important to obtain consent from the suspect before doing the DNA test and to destroy the DNA sample after using it. Even if, in exceptional circumstances, its retention is required, there should be some time limit on such retention and proper security measures need to be maintained in relation to the sample and the profile derived from it, because everyone has a right to privacy and a right to make an independent decision about their life.

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<sup>88</sup> Erica Haimes, 'Social and Ethical Issues in the Use of Familial Searching in Forensic Investigations: Insights from Family and Kinship Studies' (2006) 34 *Journal of Law, Medicine and Ethics* 263, 269; See also Murphy, above n 87, 319.

<sup>89</sup> Murphy, above n 87, 319.

<sup>90</sup> Ibid 320; See also Suter, above n 32, 364.

<sup>91</sup> Haimes, above n 88, cited in Murphy, above n 87, 320.

<sup>92</sup> Murphy, above n 87, 319, 320.

<sup>93</sup> E Donald Shapiro, 'Dangers of DNA: It Ain't Just Fingerprints' (1990) 203 (15) *New York Law Journal* at 1, col 2. The Power of Forensic DNA Technology Makes Abuse a Serious Concern, NY Forensic DNA Panel Report, cited in Shapiro and Weinberg, above n 63, 469.

The power of DNA and its related technology as well as their future potentialities are significant, but they raise profound questions that cannot be ignored. It is necessary to consider the serious moral dilemmas surrounding the use of DNA profiling. The societal answers require economic and legal reassessments (cost-benefit analysis) in regard to those fundamental rights of the individual versus those of society.<sup>94</sup> Almost all governments are required to be aware that it is simply not a matter of what the current state of DNA profiling techniques can reveal, but what might be able to be read from this technology in the near future. However, while state security measures cannot cease, due to the need to protect the people generally, a balanced approach is needed. Emphasising the need to balance human rights and the technological development in the criminal justice system, Kristina Rooker highlights that:

Not everyone who is in prison is guilty and even if they are guilty they do not leave their constitutional rights and protections at the prison door. Although it is important that law enforcement officials have DNA profiles in order to solve crimes and convict criminals, it is also important that the civil liberties and privacy of inmates be protected. There needs to be a balance.<sup>95</sup>

### III THE FUTURE OF FORENSIC USE OF DNA INFORMATION

#### *A Balancing State Security Measures, and Human Rights and Privacy*

It is essential to protect the two mutually dependent interests of society that is, forensic use of DNA for the enforcement of justice and the protection of human rights and privacy. In the field of forensics, '[t]he collection, storage and use of sensitive personal data ... always raise ethical social and legal issues'.<sup>96</sup> Some vital privacy issues include collection and retention of DNA samples and profiles for an unknown period of time, especially those taken from the individuals without their consent, and the extensive power and use of genetic samples and information by the law enforcing agencies.<sup>97</sup> Williams and Johnson highlighted some vital privacy issues:

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<sup>94</sup> Ibid 483.

<sup>95</sup> Kristina Rooker, *The Impact of DNA Databases on Privacy* (Spring 2000) Vernellia R Randall, Institute on Race, Health Care and the Law, University of Dayton School of Law, <[http://academic.udayton.edu/health/05bioethics/00rooker.htm#N\\_3\\_](http://academic.udayton.edu/health/05bioethics/00rooker.htm#N_3_)>.

<sup>96</sup> Mairi Levitt, 'Forensic Databases: Benefits and Ethical and Social Costs' (2007) 83 *British Medical Bulletin* 235, 236.

<sup>97</sup> Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24, 546.

[T]he spread of forensic DNA profiling and databasing has also prompted a wide range of concerns about problems that may arise from the storage of tissue samples (especially those taken from individuals without consent) and the proliferating uses of genetic information by the police. ... the threat to the bodily integrity of citizens who are subject to the forced and non-consensual sampling of their genetic material; the intrusion and denigration of privacy rights caused by the storage and use of tissue samples; the potential for the future misuse of such samples held in state and privately owned laboratories; the prospect of long term bio-surveillance occasioned by the storage of genetic information in police databases and biological samples in forensic laboratories; and the possibility for the deceptive use of DNA forensic evidence in police investigations and criminal prosecution.<sup>98</sup>

It is therefore argued that forensic DNA databases naturally pose a privacy threat because of the inherent nature of information contained in DNA samples. The need for some protection of personal privacy when setting up and using DNA databases is also fairly uncontroversial.<sup>99</sup> Viktor Mayer-Schönberger, however, argued that:

... striking the right balance between too little protection for privacy to be preserved and too much protection for law enforcement to effectively function is not only complex, experts also disagree on exactly how that balance can be found.<sup>100</sup>

Since the early 1990s, governments and legislators throughout the world have been struggling to keep a balance between two opposing but mutually significant interests: the establishment and uses of DNA databases in their own jurisdiction as well as concerns with regards to

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<sup>98</sup> The literature on these matters is extensive. Some significant literature that cited in Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24, 546, include: P R Billings (ed), *DNA on Trial: Genetic Identification and Criminal Justice* (Cold Spring Harbour Laboratory Press, 1992); Human Genetics Commission, *Inside Information: Balancing Interests in the Use of Personal Genetic Data* (Department of Health, 2002); Graeme Laurie, *Genetic Privacy: A Challenge to Medico-Legal Norms* (Cambridge University Press, 2002); O'Neill, *Autonomy and Trust in Bioethics* (Cambridge University Press, 2001); Thomas H Murray, 'Genetic Exceptionalism and Future Diaries: Is Genetic Information Different from other Medical Information?' in M A Rothstein (ed), *Genetic Secrets: Protecting Privacy and Confidentiality in the Genetic Era* (Yale University Press, 1997) 60–73.

<sup>99</sup> This assumption while uncontroversial is not universally held. For further details see Anita L Allen, 'Privacy-as-Data Control: Conceptual, Practical and Moral Limits of the Paradigm' (2000) 32 *Connecticut Law Review* 861, cited in Viktor Mayer-Schönberger, 'Strands of Privacy: DNA Databases and Informational Privacy and the OECD Guidelines' in David Lazer (ed), *The Technology of Justice: DNA and the Criminal Justice System* (MIT Press, 2004) 225, 225–6.

<sup>100</sup> Mayer-Schönberger, above n 99.

human rights and privacy.<sup>101</sup> This remains a legal and policy concern up to the present time, and determining the balance between the investigative benefits of DNA identification versus its privacy implications is the subject of continuous debate for almost all developed and developing countries across the globe. Governments, policymakers, and legislators worldwide are, therefore, trying to strike a rational and effective balance between the possible pitfalls or intrusiveness and the potentials or effectiveness of the use of forensic DNA profiling and databasing.<sup>102</sup> Such a balanced approach will foster use of the advances in genetic technology that serve social justice and similar interests, along with providing a sufficient guarantee for the world community that such advances 'are subject to proper ethical scrutiny and legal control'.<sup>103</sup>

DNA profiling has undoubtedly become a useful tool in the justice delivery system, especially in criminal investigations. Nevertheless, it is important to differentiate between the role of DNA samples and profiles, particularly in case investigation process, and the role of DNA databases in general. Searching for a DNA profile match in order to solve a particular case from among known suspects, and destruction of sample or profiles after resolution of that case does not require a database. On the other hand, the retention of DNA samples and profiles is justified in some circumstances, for example, if a case needs to be reopened, or a fresh investigation is required, or there is a doubt about the DNA analysis result.<sup>104</sup> The challenge at this point is to weigh up how to determine in which cases it is important to retain the DNA profile or sample (and if it is so essential, how to ensure the security of such material and the privacy of the information supplied) and also in which cases it is not so relevant to retain the DNA sample and data. Such estimations, of course, depend on the country's justice system, needs and overall situation.

Another important issue is how much access police should be given to the DNA samples after their retention. In some cases, information about a person's genetic disorder or risk could potentially be used to identify suspects, for example, if police are looking for a person with a particular disease. Currently, the police are allowed to ask for personal genetic data from an individual's medical record, but only in

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<sup>101</sup> Williams and Johnson, 'Inclusiveness, Effectiveness and Intrusiveness', above n 24, 546.

<sup>102</sup> *Ibid.*

<sup>103</sup> David Weisbrot, George Spiteri and Gabrielle Carney, 'Australian Inquiry into the Protection of Human Genetic Information' (2002) 2 *Macquarie Law Journal* 119, 131.

<sup>104</sup> Helen Wallace, 'The UK National DNA Database Balancing Crime Detection, Human Rights and Privacy' (2006) 7 *European Molecular Biology Organization* S26, S27.

preventing, detecting or prosecuting a serious crime.<sup>105</sup> How far such ethical protection can be maintained by police also raises an important question. Moreover, the lack of a consistent regulatory framework and an inadequate monitoring mechanism regarding third parties (including government) access and use of human DNA information constitute major problems.<sup>106</sup> In addition, the costs of administering and maintaining a big database and retaining millions of DNA samples are increasing day by day; and so some 'cost-benefit analysis' should be conducted.<sup>107</sup> Therefore, balancing the benefits and dilemmas regarding the access and use DNA data is a complex issue. Mark A Rothstein and Sandra Carnahan also argued about these two opposite but essential elements:

Balancing the interests in expanded forensic DNA databases is extremely complicated. On one side are the appealing and concrete ... benefits of preventing and solving a range of crimes. On the other side are abstract interests in the freedom to be left alone from governmental demands for bodily specimens.<sup>108</sup>

The current use of DNA samples and profiles in the justice delivery system is not beyond debate. It obviously poses some uncertainties regarding the future use of this promising technology (that is, human DNA sampling and data analysis) for forensic purposes. Naturally, any initiative concerning DNA data sampling of general populations for investigative purposes, or initiating any advanced use of DNA database should be supported by a thorough analysis of the scope, use and parameters of such a database. Most importantly, it should be remembered that "[t]here's a difference between what one can do, scientifically or otherwise, and what one ought to do".<sup>109</sup>

#### IV CONCLUSION

DNA profiling and databases provide law enforcement agencies with an effective tool that may revolutionise the justice delivery system around the world. With continuing advances in DNA technology, such

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<sup>105</sup> Liberty, *Whose Hands on Your Genes? Response to the Human Genetics Commission's Discussion Document on the Storage, Protection and Use of Personal Genetic Information* (March 2001) 10.4].

<sup>106</sup> Christine Rosen, 'Liberty, Privacy, and DNA Databases' (2003) 1 (29 October 2009) *The New Atlantis* 37, 51.

<sup>107</sup> Carole McCartney, 'Forensic DNA Sampling and the England and Wales National DNA Database: A Sceptical Approach' (2004) 12(2) *Critical Criminology* 157, 174.

<sup>108</sup> Mark A Rothstein and Sandra Carnahan, 'Legal and Policy Issues in Expanding the Scope of Law Enforcement DNA DataBanks' (2001-2002) 67(1) *Brooklyn Law Review* 127, 166-7.

<sup>109</sup> McCartney, 'A Sceptical Approach', above n 107 (citation omitted).

databases may become even more valuable. Since the application of improved technology in analysing DNA samples 'can yield a wealth of information about an individual'<sup>110</sup> it is crucial to appreciate that greater protective measures would be necessary to prevent potential misuse of this information. The DNA databases of genetic profiles should, therefore, be handled with the greatest respect and precautions in order to protect human privacy.

In most cases, delivering justice 'demands a complex balancing of multiple considerations'.<sup>111</sup> For instance, the proper use of DNA data without violating anyone's privacy may require this complex balancing on behalf of the persons and agencies concerned. The emerging use of DNA profiling, which causes human rights and privacy violations, requires special measures to address such violations. In addition, it is essential to take measures to control or reduce the gaps between developed and developing countries regarding the use of DNA technology in their justice delivery systems. It is, therefore, essential to guide and control the use of technological discoveries so that they can bring benefits for all. If research related to genetics and forensic use of DNA data in the justice delivery system is not controlled, protracted controversy and counterproductive inter-jurisdictional conflict may arise. Therefore, national and international measures are potentially important in order to control misuse and also to ensure proper use of genetic samples and related information in the justice delivery system.

It should be noted that the study of human genetic information and its use does not necessarily contradict support for pro-social technological development for forensic purposes. Genetic technology is similar to any other technology in that it has both merits and demerits. The purpose of this article is not to develop any completely new philosophy about how to deal with challenges associated with human genetic material and information; rather it addresses a few issues, some mechanisms or solutions that that could help to ensure the proper management of human genetic information and also ensure the appropriate use of DNA technology.

In the post-September 11 world, concepts of security and privacy have been redefined. Many new security measures are routinely taken worldwide that clearly contravene traditional concepts of privacy. Identifying personal information, such as finger prints and blood samples, are collected to make comprehensive databases of personal information (of citizens, visitors and/or foreigners) to enhance national

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<sup>110</sup> Yee, above n 68, 489.

<sup>111</sup> *Ibid.*



security. It is difficult to determine, however, if large scale human genetic projects or their databases could be utilised in the fight against terrorism in the future instead of focusing purely on medical research. Generally, all individuals have the right to determine what information should be collected about themselves and how it should be used. However, no right, including that of privacy, is absolute, but rather is subject to a number of conditions. When it comes to the handling of sensitive information like genetic data, extra attention is required. Privacy is always an important human rights issue and current trends in genetic research have raised several new questions. An appropriate international legislative or other mechanism has to be sought in order to solve the new challenges related to genetic information. Therefore, the main goal of this thesis is to review the challenges and to recommend some mechanisms to protect human genetic material and information.

Finally, it can be argued that there are two opposite but essential interests. One is human rights and privacy and the other is law enforcement for public safety and security. It is, therefore, important to take appropriate measures for balancing the constitutional guarantee of a right to privacy and other human rights with the government's duty to ensure public safety as well as secure the well-being of the people in their jurisdiction. The main idea or notion is respect and lawful protection of society without hindering individual privacy. In this respect Laura A Matejik highlighted that:

In the case of DNA collection there is a delicate balance between an individual's freedom to drink, spit, or blow his nose without fear that law enforcement will collect his genetic information and society's interest in efficiently resolving tragic crimes.<sup>112</sup>

It can be argued that technology can be a powerful force for protecting human rights. However, such technology can also subject humankind with 'an all-pervasive monitoring system' leading towards a surveillance society.<sup>113</sup> Laura A Matejik in her earlier quotation, the editorial of the journal *Nature*, similarly pointed out that in order to honour and uphold the spirit of the *Universal Declaration of Human Rights (UDHR) 1948*, a balance needed to be struck between individual freedom and social interests.<sup>114</sup>

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<sup>112</sup> Laura A Matejik, 'DNA Sampling: Privacy and Police Investigation in a Suspect Society' (2009) 61 *Arkansas Law Review* 53, 57.

<sup>113</sup> Editorials, 'Watching Big Brother' (2008) 456(7223) *Nature* 675, 675-76, cited in George J Annas, 'Protecting Privacy and the Public – Limits on Police Use of Bioidentifiers in Europe' (2009) 361 *New England Journal of Medicine* 196, 199.

<sup>114</sup> *Ibid.*