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A CRITICAL ANALYSIS OF THE ROLE OF DNA PROFILING TECHNOLOGY IN INDIA

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Abstract

The criminal system in India has evolved to accommodate technological advancements, with DNA being used as corroborative evidence in both criminal and civil cases. DNA profiling technology aims to identify potential suspects, but it faces criticism in India, for its admissibility, and efficiency in identifying probable suspects. The author critically analyses the reliability and limitations of DNA profiling technology in India using sources such as journals, book reviews, case studies, and statutes like The DNA Technology (Use and Application) Regulation Bill, 2019.

The paper also critically analyses criticism of DNA profiling technology, such as privacy violations and self-incrimination rights, to determine the adequacy of the implementation and enforcement of DNA profiling technology and laws in India. The aim is to determine the adequacy of the implementation and enforcement of DNA profiling technology and laws in the country against privacy infringement.

Keywords

DNA profiling, right to privacy, right against self-incrimination, The DNA Technology (Use and Application) Regulation Bill, 2019

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INTRODUCTION

DNA means deoxyribonucleic acid which is a double helix molecule that carries the genetic and heredity information in humans and every other organism which is essential for their functioning and development. DNA is a double helix molecule made of two strands of alternating sugar and phosphate groups bound together by chemical bonds between the bases, the sequence of which encodes biological information.² DNA differs from one individual to another with no two individuals sharing the same DNA, with twins being exceptions, but can sometimes be differentiated based on their genetic information.³ The structure and sequencing of DNA in an organism provide a genetic blueprint for the identification and differentiation of human beings.

The origins of DNA Technology's application in forensic crimes can be traced back to the Pitchfork murder case⁴ in the year 1984. In this case, British geneticist Alec Jeffreys who was actively working on techniques to identify individuals through samples of their DNA devised a new way to use the original DNA fingerprint using which Alec and his college helped the police identify a man who had raped and killed two girls by tracing and comparing the DNA found from the semen samples obtained in both the bodies.⁵ The Pitchfork case was testimony to the application of DNA profiling in not just identifying prospective suspects to the crime but also proved the accused in this case innocent.⁶

While DNA's application in the early years was limited to civil cases for attesting paternity since DNA is hereditary and is carried from one generation to another, later the scope and utility of DNA was expanded to incorporate forensics and profiling to determine prospective suspects of certain crimes. DNA samples can be collected from liquid blood or bloodstains, liquid saliva or saliva stains, and liquid semen or dried semen stains deposited on nearly any surface; pieces of tissue/skin, fingernails, plucked and shed hairs from the body, skin cells on drinking vessels,

² GENETIC ALLIANCE, NEW YORK-MID-ATLANTIC CONSORTIUM FOR GENETIC AND NEWBORN SCREENING SERVICES, UNDERSTANDING GENETICS: A NEW YORK, MID-ATLANTIC GUIDE FOR PATIENTS AND HEALTH PROFESSIONALS, (Genetic Alliance 2009).

³ Weber-Lehmann J, Schilling E, Gradl G, Richter DC, Wiehler J, Rolf B. *Finding the needle in the haystack: differentiating 'identical' twins in paternity testing and forensic by ultra-deep next generation sequencing*, FORENSIC SCI. INT. GENET 9 (2014).

⁴ R v Pitchfork, (2009) EWCA Crim 963.

⁵ VISIBLE PROOFS, <https://www.nlm.nih.gov/exhibition/visibleproofs/galleries/cases/jeffreys.html> (Last visited August 27, 2023).

⁶ Sadhana Swaminathan, *Establishing a National DNA Database in India*, YLCUBE, (Sept 3, 2023, 8:33 PM) <https://ylcube.com/c/blogs/establishing-national-dna-database-india/>

clothing, slides containing tissue, semen, etc., and liquid urine.⁷ Samples are collected from bodies which consists of urine, blood swabs, stains, mouth swabs, bones, teeth samples, skin and tissues from the muscles.⁸ DNA profiling, also known as DNA fingerprinting, is the method of identifying individuals using the DNA profiles collected from their samples.

There are seven steps involved in the process of DNA profiling, namely⁹ –

- a. Isolation and Extraction – In the first step of DNA fingerprinting, the DNA is extracted from the cell and is isolated or purified by chemical treatment.
- b. Amplification – Following the extraction process, the quantity of DNA is ascertained and several numbers of copies of the DNA sample are created a technique called polymerase chain reaction (PCR).
- c. Digestion of DNA – The DNA samples are snipped at specific places according to different lengths and cut into several fragments
- d. Separation – The DNA molecules are separated in the presence of an electric field in the process of electrophoresis after which they are split into single strands.
- e. Transferring/ Blotting – The DNA fragments are covered in gel which in turn is covered with nylon fabric and blotted so that the DNA bits are transferred into the nylon
- f. Hybridization – The nylon membrane is put into a bath containing probes to detect the position by an X-Ray film
- g. Detection – The membrane is subjected to the X-ray film to identify distinctive patterns of light and dark bands that disclose the composition of the DNA. The dark bands represent the DNA profiles.¹⁰

DNA EVIDENCE: ADMISSIBILITY & APPLICATION

DNA is being used to identify the fingerprints of probable suspects mostly in criminal cases, it is being practiced for a long time now and was first used in the Pitchfork case.¹¹ DNA fingerprinting

⁷ *DNA Evidence Basics: Types of Samples Suitable for DNA Testing*, NATIONAL INSTITUTE OF JUSTICE, 8th August, 2012, available at <https://nij.ojp.gov/topics/articles/dna-evidence-basics-types-samples-suitable-dna-testing>, (Sept. 2, 2023).

⁸ *Ibid.*

⁹ Janet C. Hoeffel, *The Dark Side of DNA Profiling: Unreliable Scientific Evidence Meets the Criminal Defendant*, 42 STANFORD LAW REVIEW, 465, 471-475 (1990).

¹⁰ Jyothirmayee Nayak, *DNA Fingerprinting: Steps, Process & Importance*, EMBIBE, 21st June, 2023, available at <https://www.embibe.com/exams/dna-fingerprinting/>, (Sept. 3, 2023).

¹¹ *Supra* note at 5.

has been used in several cases ever since, including cases like the Golden State Killer¹², Murder of Anna Jean Kane¹³, Murder and Sexual Assault of Fawn Marie Cox¹⁴, Jodi Loomis¹⁵, Shannon Rose Lloyd and Renee Cuevas¹⁶, etc. DNA has been used as admissible evidence in both civil and criminal cases. The Wisconsin case in which an 18-year-old Traci was brutally strangled, raped and murdered was thought of as a cold case until the police began to match the DNA samples found from the semen in the body of the victim with the samples stored in their genealogy databases. The police identified the second cousin Philip Cross as a probable suspect based on the DNA matches wherein it was later proved that he was indeed the offender who had raped and murdered the victim due to a history of rage and drug overdose.¹⁷ Thus, the DNA samples assisted in identifying probably suspects in such cold cases wherein no other evidence was available.

In the Indian context, the first case to use DNA profiling technology and hold it admissible was the case of *Kunhiraman vs Manoj*¹⁸ wherein DNA fingerprints were used to establish paternity and DNA was held as admissible evidence under Section 45 of the Indian Evidence Act, 1872. Since then, DNA profiling has been used in several cases as admissible evidence. In the Kotkai rape and murder case, DNA profiling was used to trace the accused by matching the samples of fingerprints obtained. In the case of *Selvi vs. State of Karnataka*¹⁹, the Supreme Court upheld the importance of obtaining consent prior to conducting the narcoanalysis and obtaining samples which otherwise would be subject to a violation of the Constitution of India concerning Article 20(3) which states protection against self-incrimination. Though DNA profiling is considered as accurate evidence in identifying suspects and probable matches, however, there have been instances wherein DNA profiling has been rejected as adequate evidence and conclusive proof and dismissed by the Court. In the *Santosh Kumar Singh v State through CBI*²⁰, also known famously as the Priyadarshini

¹² Michael Levenson, *Golden State Killer Sentenced to Life in Prison Without Parole*, NEW YORK TIMES (Aug. 21, 2020).

¹³ Marlene Lenthag, *DNA from letter sent to local newspaper helps solve 34-year-old cold case murder of Pennsylvania mom*, NBC NEWS (Aug. 22, 2022).

¹⁴ The Kansas City Police Department Missouri, *New DNA technology solves cold case* (2020), <https://www.kcpd.org/media/3268/oct-dec-2020-6-pages.pdf>.

¹⁵ Neil Vigdor, *Suspect in 1972 Murder Dies in Suicide Hours Before Conviction*, NEW YORK TIMES (Nov. 9, 2020).

¹⁶ Vikki Vargas and Danielle Smith, *Killer Linked to 1980s Cold Case Murders of Two OC Women Identified Through DNA Technology*, NBC NEWS (Jul. 25, 2022).

¹⁷ Doha Madani, *35-year-old cold case murder in Wisconsin solved using DNA and genealogy, police say*, NBC NEWS (Oct.23, 2019).

¹⁸ *Kunhiraman v. Manoj*, (1991) 3 Crimes 860 (Ker).

¹⁹ *Selvi vs. State of Karnataka*, AIR 2010 SC 1974, (2010) 7 SCC 263.

²⁰ *Santosh Kumar Singh v State through CBI*, (2010) 9 SCC 747.

Mattoo case, the Court rejected crucial and irrefutable evidence related to the DNA findings on technical grounds of tampering of evidence along with shoddy investigation and decided the case only on the basis of other circumstantial and material records presented before the Court.

The reliability of DNA as evidence has been questioned over time with one of the examples being the case of *People v Castro*²¹ wherein the defendant Joseph Castro who was identified, by the victim's boyfriend, leaving the building smeared in blood after allegedly ghastly stabbing the victim Vilma Ponce and her two-year old daughter. Based on the allegation, the police investigated and found dried blood on the grooves of Castro's watch which he alleged were his own and was later sent to Life codes for DNA fingerprinting for testing. Life codes declared a match between the DNA found on the watch and the DNA found in the victim Vilma Ponce's blood. However, since the defense was able to uncover some serious blunders in the procedure, and corroborated this by identifying scientists to state that DNA was inadmissible after which the Judge declared that DNA was unreliable evidence and was declared inadmissible.²² The reliability of DNA has been questioned time and again due to the possibility of cross-contamination and degradation of specimens in a laboratory environment.²³ If the probe contaminates the samples, it will bind itself to the sample producing similar bands between both the probe and the sample which might lead to the wrongful conviction of an innocent due to DNA fingerprinting.²⁴ In cases wherein the probe is contaminated with bacteria, the DNA bands can not only be altered but might also lead to misleading band patterns. The DNA bands may be blurry, faint and variable depending on the thickness, consistency, temperature, salinity of the gel used in the testing process.²⁵ Given the sensitivity of information and data present in DNA samples, there was a need to regulate the collection and testing of DNA fingerprints in India and thus, the DNA Technology (Use and Application) Regulation Bill, 2019 was introduced concerning the DNA profiling.

THE DNA TECHNOLOGY (USE AND REGULATION) BILL, 2019 AND LAWS RELATED TO THE SAME IN INDIA

²¹ *People v. Castro*, 144 Misc. 2d, 956, 960 (1989).

²² Jennifer L. Mnookin, *People V. Castro: Challenging the Forensic Use of DNA Evidence*, 3 UCLA LAW, 77-105 (2007).

²³ William C. Thompson & Simon Ford, *DNA Typing: Acceptance and Weight of the New Genetic Identification Tests*, 75 VA. L. REV. 45, 65.

²⁴ *Ibid*, at 94-95.

²⁵ *Ibid*, at 81.

The DNA Technology (Use and Application) Regulation Bill, 2019 was subject to criticism due to the threat it poses towards the infringement of the right to privacy of individuals. The Law Commission Report on DNA technology presented several changes to be incorporated into the Bill to regulate the privacy and safety of DNA fingerprints. The recommendations propose substituting terms such as 'victims,' 'offenders,' 'missing persons,' and 'unknown deceased persons' instead of 'suspects' or 'undertrials' in the comprehensive title of the Bill. This adjustment aims to restrict the individuals eligible for DNA fingerprinting, thereby preventing potential misuse.²⁶ The DNA Technology (Use and Application) Regulation Bill, 2019 states to set up a regulatory body²⁷ working with the advisory of the Government regarding the laboratories set up for DNA profiling and Data depository²⁸, supervising the labs and the bank of data concerning quality control or data check²⁹, organizing the programs for training and auditing for labs and banks³⁰, etc.

The DNA Technology (Use and Application) Regulation Bill, 2019 was subject to criticism when presented for approval. The main aim of the Bill was to introduce the country to DNA profiling and not to regulate or interfere with the testing or analysis and thus had to be eliminated from the Bill. The DNA Bill allows for the setting up of a National DNA Data Bank and Regional Data Banks which would transfer data to the National DNA Data Bank. Since the Regional Data Bank served no additional purpose other than transferring the data, it was suggested to be deleted from the Bill.³¹

The Malimath Committee³² in the submitted report suggested the inclusion of forensic sciences in criminal investigation and the addition of experts in DNA concerning the Code of Criminal Procedure under Section 293(4).³³ In addition to this, the committee also suggested a uniform statute for testing of DNA, its admissibility, and protection against misuse, etc. The Committee also recommended that the Identification of Prisoners Act of 1920 be amended to allow the

²⁶ Department related Parliamentary Standing Committee On Science And Technology, Environment, Forests And Climate Change, The DNA Technology (Use And Application) Regulation Bill, 2019 (Report No. 340 2021), <https://sansad.in/rs/committees/19?departmentally-related-standing-committees> .

²⁷ The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 3.

²⁸ The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 12 (a).

²⁹ The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 12 (c).

³⁰ The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 12 (e).

³¹ Supra note at 22.

³² Law Commission of India, Committee on Reforms of Criminal Justice System, (Law Commission Report No. 86, 2003), https://www.mha.gov.in/sites/default/files/criminal_justice_system.pdf

³³ Code of Civil Procedure, 1908, Sec. 293(4), Acts of Parliament, 1908.

Magistrate to authorize the collection of fingerprints, footprints, photographs, blood samples for DNA, fingerprinting, hair, saliva, or sperm, and so on, by Section 27 of POTA 2002, because there is no law requiring the accused to provide specimen writings or blood samples for DNA fingerprinting.³⁴ The Report recommended a special enactment stating the specified guidelines and standards for obtaining genetic information.

India does not have any specific legislation governing DNA profiling and the Code of Criminal Procedure, 1973 has served as the driving law to correct inconsistencies in DNA fingerprinting. Sections 53 and 54 of the Criminal Procedure Code allow a medical practitioner to examine the accused at the request of a police officer.³⁵ If there are reasonable reasons to expect such examination will serve as evidence as to the commission of the offence and the examination of the detained person by a medical practitioner at the arrested person's request.³⁶ unless there is reasonable grounds to believe that such a request has not been made to delay or defeat the ends of justice, respectively provided for an implied application of DNA profiling.³⁷ In 2005, through an amendment presented to the CrPC, Section 53A was enacted, which necessitates inspection by a certified medical practitioner for sexual offences by the study of blood, blood stains, semen, and other advanced technologies like DNA profiling etc.³⁸ For further investigation under sections 173(8) and 293(4)(e) of the CrPC). Other than these provisions, Section 45 of the Indian Evidence Act and Section 293 of the CrPC mention the evidentiary value and importance of the opinions of experts, including persons particularly skilled in foreign law, science, or art (or in question as to the identity of handwriting or finger impression).³⁹ While Section 53A confines itself to examination in cases of sexual offences, there has been no explicit provision for DNA profiling for crimes other than sexual offences, like murder, culpable homicide, etc. which were not covered under Section 53A which results in ambiguity of application and testing under DNA fingerprinting methods and its regulation.

³⁴ Supra note at 22.

³⁵ Code of Criminal Procedure, 1973, Sec. 53, Acts of Parliament, 1973.

³⁶ Code of Criminal Procedure, 1973, Sec. 54, Acts of Parliament, 1973.

³⁷ Subhash Chandra Singh, *DNA Profiling and the Forensic Use of DNA Evidence in Criminal Proceedings*, 53 JOURNAL OF THE INDIAN LAW INSTITUTE 195, 213 (2011).

³⁸ Code of Criminal Procedure, 1973, Sec. 53A, Acts of Parliament, 1973.

³⁹ Indian Evidence Act, 1872, Sec. 45, Acts of Parliament, 1872.

THE CRITICISMS & SHORTCOMINGS OF DNA TECHNOLOGY (USE AND APPLICATION) REGULATION BILL, 2019

The DNA Technology (Use and Application) Regulation Bill, 2019 which was introduced to regulate the collection, storage and analysis of DNA samples in the country to assist and improve the criminal investigation system was subject to several criticisms, due to which the Bill was withdrawn from the Lok Sabha on 24 July, 2023. The accusations were based on ignorance of certain safety provisions and measures given the gravity of sensitive information stored in DNA samples which have a potential threat of infringing the right to privacy that was guaranteed as part of a fundamental right.⁴⁰

There are 3 possibilities in which a database can be created according to specific needs, namely

- (i) A framework utilizing a comprehensive DNA fingerprinting examination of the population along with the preservation of DNA profile analysis for all evidence discovered at the crime scene,
- (ii) A system reliant on DNA analysis of samples specifically for a designated list of crimes, and the documentation of DNA profiles from all pertinent evidence discovered at the crime scene for those specified offences,
- (iii) A system centered solely on the targeted examination of a case, involving the collection of samples from an individual known to have a significant association with the ongoing crime investigation. The process includes comparing the evidence gathered within the context of this specific inquiry.⁴¹

However, the DNA Bill does not specify the type of database to be created and what are the specific needs it would be catering to, whether the database would be for all evidence found at the crime scene, or for particular kinds of evidence, or for a particular list of suspects, or for a specific kind of analysis, etc. There are no mentions of the purpose of collection of the kinds of DNA evidence which leads to the assumption of the DNA evidence of any kind could be subject to

⁴⁰ K.S. Puttaswamy and Anr. vs. Union of India, (2017) 10 SCC 1.

⁴¹ Margarita Guillen, Maria Victoria Lareu, Carmela Pestoni, Antonio Salas and Angel Carracedo, *Ethical-legal problems of DNA databases in Criminal investigation*, JOURNAL OF MEDICAL ETHICS [226] (2000).

collect, testing and analysis which could result in infringement of privacy due to the sensitive nature of the data being collected in this case.

The UK GDPR defines genetic data as “personal data relating to the inherited or acquired genetic characteristics of a natural person which give unique information about the physiology or the health of a natural person and which result, in particular, from an analysis of a biological sample from the natural person in question”.⁴² Recital 34 includes chromosomes, DNA, RNA or any other analysis that enables obtaining of equivalent information as genetic data.⁴³ Genetic data when analyzed to produce some data would then constitute personal data. In the Digital Personal Data Protection Act, 2023, personal data is defined as “any data about an individual who is identifiable by or in relation to such data”.⁴⁴ There is no clarity or mention of DNA or genetic data to be considered a part of personal data or not and this results in ambiguity in the scope of application of DNA as a part of the Data Protection Act. The Act does not define ‘personal data’ which results in ambiguity as to whether consider DNA as personal data or not owing to the sensitive nature of DNA and its impact on human life and fundamental rights.

The Kerala High Court in the case of *Das@Anu v State of Kerala and Another*⁴⁵, wherein the petitioner who was charged under Sections 376, 511, 313 r/w 34 of the Indian Penal code refused to cooperate when the prosecution filed an application to make the petitioner available for DNA testing. The Court held that drawing DNA samples in sexual offences against himself or compelling to be a witness against himself will not violate the right against self-incrimination and is applicable only in testimonial evidence as DNA has been incorporated as part of a statutory scheme with the insertion of Section 53A and Section 164A of the CrPC inserted by way of an Amendment in 2005 which makes DNA profiling of the victim and accused permissible in cases of sexual offences. However, the same is not applicable in case of offenders of minor crimes like theft, etc. who cannot be compelled to give their DNA samples unlike sexual offenders as per the mandate of the Act. If their DNA samples are collected by force against their consent, this would amount to self-incrimination which is a right available under Article 20 (3) which states, "No

⁴² The General Data Protection Regulation, 2016 (European Union), Article 4(13).

⁴³ Information Commissioner’s Office, *What is special category data?*, available at <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/lawful-basis/special-category-data/what-is-special-category-data/#:~:text=A%20genetic%20sample%20itself%20is.back%20to%20an%20identifiable%20individual>. (Last visited Sept.10, 2023).

⁴⁴ Digital Personal Data Protection Act, 2023, No. 22, Acts of Parliament, 2023, Sec.2 (t).

⁴⁵ *Das@Anu v State of Kerala and Another*, CRL.MC NO. 8065 OF 2018.

person accused of any offence shall be compelled to be a witness against himself."⁴⁶ and the same has not been addressed in the Bill.

The shortcoming of DNA profiling technology in India run deep, not just in terms of procedural and technical ambiguity, but also is financially non-feasible in nature. UK, in 2010, became the first country to set up a national database for DNA profiling samples containing over 5 million samples. Maharashtra became the first state in India to set up a first-of-its-kind DNA fingerprinting database for offenders in Kalina.⁴⁷ The database aims to preserve DNA profiles of individuals and aid in comparing samples from a crime scene to identify potential suspects for the crime. The purpose of the DNA database as explained then was to identify repeat offenders such as those who commit a crime in one state and flee to another who could still be identified by DNA samples to prevent frauds such as election ID or Aadhaar card frauds.

One of the most prominent cases of DNA fingerprinting by the Forensic Science Laboratory in Kalina is that of Sheena Bohra's murder case wherein the skeletal remains found by the police was compared with the deceased's mother's DNA to confirm the exact match between both their DNA markers and establish paternity and hence used DNA profiling technology to solve the case.⁴⁸ But, the cost of acquisition of the machine in Kalina's Forensic Science Laboratory is around Rs.2 crores and is set to store around 1 million samples. This technology analyses and gives results in less than 2 hours whereas it usually takes up to 24-72 hours to conduct genetic testing. But the shortcoming with this technology was that the purpose was stated by Dr Shailesh Mohite as, "This might turn out to be expensive, especially when it comes to extracting DNA for identification of mass deceased in natural or other disasters, where the victims cannot be identified or the remains are fragmented. Also, in cases of identification of corpses where the head is missing and body parts are at different places, it might be costlier, as each body part will have to be analyzed separately." Forensic scientists have criticized stating that the cost of analysis of each sample was around Rs.19,000 was not suitable for all crime scenes as the instruments consume the entire DNA

⁴⁶ INDIA CONST., art. 20(3).

⁴⁷ TNN, *Maharashtra to create DNA database of offenders*, THE TIMES OF INDIA (Sept 16, 2017) http://timesofindia.indiatimes.com/articleshow/60705938.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst .

⁴⁸ Maitri Porecha, *Sheena murder case: DNA from Raigad bones matches Indrani Mukerjea's blood samples*, 8th September, 2015, available at <https://www.dnaindia.com/india/report-sheena-murder-case-dna-from-raigad-bones-matches-indrani-mukerjea-s-blood-samples-2122955> (last visited 14 September, 2023).

sample⁴⁹ and hence the testing and analysis had to be limited to high-profile cases only and therefore this technology could not be used in solving all criminal cases which in a way defeats the purpose of investing in a high-profile DNA profiling technology and database.

Himachal Pradesh became the first state in the country to set up a DNA database for unidentified bodies to maintain a private, local database of DNA profile information which could assist in the right identification of bodies by comparing it with the stored DNA samples.⁵⁰ The purpose of a DNA database is to store samples of DNA which can be used for comparing DNA samples taken from the victim or crime scene to find a match and identify either the biological background of the victim or probable suspects to the crime.⁵¹ Every DNA Data Bank shall maintain the following indices for various categories of data, namely — (a) a crime scene index; (b) a suspects' index or under-trials' index; (c) an offenders' index; (d) a missing persons' index; and (e) unknown deceased persons' index.⁵² On receipt of DNA samples, the National DNA database may compare the samples with the stored DNA profiles to ascertain a match between the profiles. This poses a serious threat to the right to privacy of individuals whose genetic/ DNA data is being stored in the system. The DNA Technology (Use and Application) Regulation Bill, 2019 does not clarify the time period for which the DNA samples of individuals are to be stored in the DNA database and there is a possibility of the samples being stored in the DNA database for an indefinite period of time which can impose a threat to the privacy of an individual.

The Bill fails to produce a plausible categorization of persons whose DNA is to be preserved, through intelligible distinction, with a rational link over the purpose it intends to achieve as stated in Article 14 and is arbitrary in nature.⁵³ The purpose of the Bill was to accelerate of crime detection and thus, the use of samples are to be limited only to identify those with a high probability of re-offending. The Bill proposes to store DNA samples of all individuals that could be covered under civil and criminal disputes for identification and assistance in solving both civil and criminal

⁴⁹ Vinod Kumar Menon, *Maharashtra state to be the first to get Rs 2 crore Rapid DNA analysis machine*, 9th March, 2018, available at <https://www.mid-day.com/mumbai/mumbai-news/article/maharashtra-state-to-be-the-first-to-get-rs-2-crore-rapid-dna-analysis-machine-19171176> (last visited 14 September, 2023).

⁵⁰ Tulika Bishnoi, *Himachal Pradesh creates India's first DNA database for unidentified bodies*, 18th April, 2023, available at <https://newsonair.com/2023/04/18/himachal-pradesh-creates-indias-first-dna-database-for-unidentified-bodies/#:~:text=Himachal%20Pradesh%20has%20become%20the,DNA%20samples%20of%20unidentified%20bodies> (last visited 14 September, 2023).

⁵¹ S. Panneerchelvam, M.N. Norazmi, *Forensic DNA Profiling and Database*, 10 MJMS 20 (2003).

⁵² The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 26(1).

⁵³ Rebant Juyal, *Regulation & Use of DNA Profiling in India*, 2 QMLJ 36 (2021).

cases which is against public interest and defeats the purpose of the Bill. If samples are not properly handled, separated, and preserved, there is a chance of mix-up, which leads to incorrect convictions; the preservation of profiles might stigmatize innocent persons; Re-analysis of archived samples may reveal important health-risk information.⁵⁴ Since DNA is sensitive data, there are possibilities of the stored data being used to trace genetic background, health information, ancestry, etc. which infringes upon the right to privacy.

There is no mention of which category of populations' data would be stored in the DNA database which makes room for a possible inclusion of minors, persons charged for minor crimes, persons convicted in the past, etc. and there is no mention of how the consent for collection of DNA samples would be obtained. Furthermore, the Bill mentions the retention and removal of DNA samples of (i) a suspect, after the filing of the police report under the statutory provisions or according to the order of the court; (ii) of an undertrial, as per the order of the court, under notification to him, in such way as may be stipulated by regulations alone.⁵⁵ There is no requirement for the destruction of samples taken from individuals accused of a crime and the removal is based on the written request of the individual who is neither a suspect, offender nor under trial. There is a possibility of indefinite retention of the samples stored in the DNA database which poses a serious threat to the right of privacy of individuals. In the case of *S and Marper v. the United Kingdom*⁵⁶, The Court determined that the UK government's indefinite and sweeping DNA and fingerprint keeping practices for all individuals suspected of committing crimes violated the right to privacy. The indefinite blanket preservation of DNA samples in the DNA database poses a considerable risk of being exploited, therefore infringing on people's right to privacy.

CONCLUSION

Though DNA profiling technology has shown to be useful in solving various civil and criminal cases by confirming paternity and detecting a match between samples to identify potential suspects to the case, there are certain provisions and measures in The DNA Technology (Use and Application) Regulation Bill, 2019 that needs to be reconsidered. DNA being an extremely sensitive data could reveal a person's identity right from personal information to family

⁵⁴ *DNA profiling in India*, NAT METHODS 12, 995 (2015).

⁵⁵ The DNA Technology (Use and Application) Regulation Bill, 2019, Bill No. 128 of 2019, Sec. 31(2).

⁵⁶ *S and Marper v. the United Kingdom*, [2008] ECHR 30562/04.

background, etc. and due to this reason, the safety measures and standards cannot be overlooked and have to be strict in the present case to ensure the DNA samples are stored safe and the entire process of collection, storage and analysis of DNA samples is regulated keeping in mind the safety and privacy of individuals.

The DNA Technology Bill poses a direct threat to the Right to life and personal liberty if it is not properly regulated with utmost caution and safety. Exploitative vulnerability of DNA profiles and the privacy of people have to be balanced against the State's right to collect samples from suspects and accused to aid the process of investigation and ensure justice. The extraction of an individual's DNA for DNA profiling constitutes an invasion of the fundamental right to privacy, which violates the core principles of the Indian Constitution.

The Bill needs to be reviewed and the criticisms and missing provisions to be incorporated to create and ensure the utmost safety standards. As a result, it must be assessed in light of India's constitutional principles and ideals, as well as discipline, morality, and ethos. Thus, there is a need to create an ecosystem for the effective use and application of DNA profiling that ensures individuals' safety and privacy while also employing DNA profiling as a tool in criminal investigation.