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REVIEW ARTICLE

Current scenario of forensic DNA databases in or outside India and their relative risk

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Abstract: DNA technology has proved to be a worthy investigative tool for releasing the innocent citizens and bringing forth the person responsible for serious crimes. In a populated country like India there is a requirement for these types of databases. The Union government is working on a new version of a legislation that seeks to set up a national DNA database of 'offenders'. As expected with the great success of the use of forensic DNA databases, new challenges are coming up. To rise to the challenges, different strategies have been proposed for increasing search capabilities, the implementation of which is on-going. The Federal Bureau of Investigation (FBI) in the US has proposed to add more autosomal short tandem repeat (STR) loci to its current core set of loci. The constant growth in the size of forensic DNA databases raises issues on the criteria of inclusion and retention and doubts on the efficiency, commensurability and infringement of privacy of such large personal data collections. People have difficulties that spill beyond the level of simple privacy and confidentiality issues.

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1. Introduction

DNA technology has proved to be a worthy investigative tool for releasing the innocent citizens and bringing forth the person responsible for serious crimes. The motive of establishing forensic DNA databases was to develop investigative leads for solving crimes which usually was the purview of "criminal justice agencies for law enforcement identification purposes".[1]

Forensic DNA databases are now well established in many countries in the world. The first government database (NDNAD) was set up by the United Kingdom in 1995 followed by New Zealand.[2] France set up the Fichier National Automatisé des Empreintes Génétiques (FNAEG) in 1998. In the USA, the FBI has organized the Combined DNA Index System (CODIS) database. Originally intended for sex offenders, they have since then been extended to include almost any criminal offender.

In England and Wales, anyone arrested on suspicion of a recordable offence must submit a DNA sample, the profile of which is then stored in the DNA database as a permanent record. In Scotland, the law requires the DNA profiles of most people who are acquitted to be removed from the database. In Sweden, only the DNA profiles of criminals who have spent more than two years in prison are stored. In Norway and Germany, court orders are required, and are only available, respectively, for serious offenders and for those convicted of certain offences and who are likely to reoffend. Forty-nine states in the USA, all apart from Idaho, store DNA profiles of violent offenders, and many also store profiles of suspects.[3] In 2005 the incoming Portuguese government proposed to introduce a DNA database of the entire population of Portugal.[4] However, after an informed debate including the opinion from the Portuguese Ethics Council[5] the database to be introduced was revised only to include criminals.[6]

The United States maintains the largest DNA database in the world, with the CODIS holding over 9 million records as of 2011.[7] The United Kingdom maintains the National DNA Database (NDNAD), which is of similar size. The size of this database and its rate of growth, is giving concern to civil liberties and political groups in the UK,[8] where police have wide-ranging powers to take samples and retain them even in the event of acquittal.[8] Other countries have adopted privately developed DNA databases, such as Qatar, which has adopted Bode dbSEARCH.[9] In addition to direct matching between known and unknown sample profiles, profiles from missing persons and their relatives, as well as unidentified human remains, are included in a number of databases.[10,11]

Missing person identification also is an invaluable module for investigating certain crimes. When a match is made from a national DNA database to link a crime scene to an offender who has provided a DNA sample to a database that link is often referred to as a cold hit. A cold hit is of value in referring the police agency to a specific suspect but is of less evidential value than a DNA match made from outside the DNA database. As of March 2011, 361,176 forensic profiles and 9,404,747 offender profiles have been accumulated,[7] making it the largest DNA database in the world. As of the same date, CODIS has produced over 138,700 matches to request, assisting in more than 133,400 investigations.[12] The United Kingdom National DNA Database consisted of an estimated number of 5,512,776 profiles of individuals as of March 2011.[13]

The growing public approval of DNA databases has seen the creation and expansion of many states' own DNA databases. California currently maintains the third largest DNA database in the world (naturally, as CODIS contains all states' database information). Political measures such as California Proposition 69 (2004), which increased the scope of the DNA database, have already met with a significant increase in the numbers of investigations aided. The application of DNA databases has been expanded into two controversial areas: arrestees and familial searching. An arrestee is a person arrested for a crime and who has not yet been convicted for that offence. Currently, 21 states have passed legislation that allows law enforcement to take DNA from an arrestee and enter it into the state's CODIS DNA database to see if that person has a criminal record or can be linked to any unsolved crimes. In familial searching, the DNA database is used to look for partial matches that would be expected between close family members. This technology can be used to link crimes to the family members of suspects and thereby help identify a suspect when the perpetrator has no DNA sample in the database.[14]

As expected, with the great success of the use of forensic DNA databases, new challenges are coming up. The databases are experiencing rapid growth, and thus there is a potential of increased adventitious hits; the power for current and new applications (e.g., missing person identification and familial searching) requires additional infrastructure support; and there is an increased desire for international data sharing,[15–17] which possibly could be retarded if only a relatively small number of loci is shared among laboratories worldwide.

2. Current scenario in India

In a populated country like India there is huge requirement for these types of databases which may help in stopping different types of fraud like ration card fraud, voter identity card fraud, driving license fraud etc. The database may help the Indian police to differentiate the criminals and non criminals. The Union government is working on a new version of a legislation that seeks to set up a national DNA database of 'offenders', that allows for the collection and storage of DNA samples of those accused in cases ranging from homicide, sexual assault and rape to even violations under the Motor Vehicle Act.