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### No innocents in forensic DNA

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**THE blessings of forensic DNA profiling are numerous. Yet, the same technologies used for evidence and police investigations pose social, legal and ethical challenges that go beyond the interest of the 'usual suspects' and law enforcement officials. So what are these challenges, and why does it matter for Singapore?**

Singapore's national DNA database was established in 2003 after the Criminal Law (Temporary Provisions) Act was passed. The database holds DNA profiles of convicted offenders as well as suspects. The profiles are removed from the database when suspects have been acquitted or discharged, and when the originator dies or reaches the age of 100. As the law does not provide for the destruction of bodily samples, it is assumed that all samples, including those provided by innocent people, are retained.

Based on the annual growth of the database and the reported increase in sample volume in the past few years, it is assumed that the database will hold between 150,000 and 250,000 DNA profiles (3 per cent to 5 per cent of the 5.1 million people living in Singapore) by the end of the year.

More than 350 cases were solved by the database between 2003 and 2009. This averages 1.2 matches per week. A rather poor result when compared with the 65 weekly matches of the Dutch DNA database, which holds 124,000 profiles (0.73 per cent of its 17 million population) and 47,000 traces.

Statistical evidence from studies carried out in the United States suggests that the efficacy of DNA databases increases by profiling only convicted offenders, and by uploading more DNA traces. So using the database to solve crimes, and hence to make Singapore a safer society, is not so much about profiling a considerable amount of the population, but by uploading more DNA traces and comparing them with profiles obtained from proven offenders.

Besides searching for matches, DNA databases can also be used to search for 'near matches'. A near match may mean that a sibling or other biological relative of a person already in the database is the originator of a DNA trace. In other words, a culprit can be caught through the DNA of biological relatives.

This technique called 'familial searching' has been used in the US and Britain. Statistical data from England and Wales indicates that 25 per cent of familial searches are successful. So familial searching can be an important addition to the existing arsenal of technologies for crime investigation.

But familial searching is regarded as highly problematic as it renders lists of hundreds of near matches. It is not known how many innocent families and family members have been made part of criminal investigation using this technique. It is therefore also unknown what its fiscal costs are, yet it is assumed that the costs are high.

Another new DNA technique enables geneticists to predict external visible characteristics (for example, gender, ethnicity, eye colour and geographical descent) of the (unknown) originator of a crime scene sample. These external visible characteristics allow the police to focus on groups of similar-looking 'non-suspects', for instance, a Chinese or Indian population.

Non-suspects can be asked to volunteer a sample in a DNA dragnet (a DNA mass screening). In other words, non-suspected volunteers may be asked to prove their non-involvement in a crime, which shifts the onus of proof from the prosecutor to the non-suspect. This is opposed to the presumption of innocence - a central tenet of criminal law. The subsequent question, then, is whether the police should be allowed to use 'its strong arm of the law' when a non-suspect refuses to volunteer a sample.

A common argument in favour of expanding national DNA databases and using DNA dragnets and familial searching is that if you have nothing to hide, you have nothing to fear. Such statements cloak the real issue: Everybody with a specific gender, ethnicity, eye colour, geographical descent or familial relation can become a suspicious non-suspect. In other words, new DNA technologies have the capacity to render nearly anyone a suspect.

These are not arguments against new DNA technologies per se, rather that safeguards should be in place when these forensic technologies are applied. Singapore's law does not forbid familial searching, the use of external visible characteristics or DNA dragnets, yet any provisions for responsible, balanced and proportionate application are lacking.

It is in this light that the use of new forensic DNA technologies merits further debate between policymakers, DNA experts, the police and - importantly - other stakeholders like human rights activists, legal scholars, opinion leaders and the public.

Essential for such discussion is that the Health Sciences Authority and the police make more data available regarding the use and efficacy of forensic DNA technologies. Greater transparency allows the public to develop informed opinions on this topic and hence give shape and form to the further governance of forensic DNA technologies in Singapore.

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