Return to Full

LexisNexis™ Academic

NewScientist
New Scientist

October 23, 2004

SECTION: Comment; Comment and Analysis; Pg. 20

LENGTH: 836 words

HEADLINE: Guilt by association;
Should the law be able to use one person's DNA to carry out surveillance on their family? Not without a public debate say Frederick Bieber and David Lazer

BYLINE: Frederick R. Bieber; Frederick R. Bieber is associate professor of pathology at Brigham and Women's Hospital, Harvard Medical SchoolDavid **Lazer** is associate professor of public policy at Harvard University. He is editor of DNA and the Criminal Justice System: The technology of justice

BODY:
IN 1988, Lynette White was found stabbed to death in her flat in the Welsh capital, Cardiff. A DNA sample from the crime scene did not match any sample in the UK's national DNA database, and the murder confounded detectives. Then, in 2003, came a breakthrough. A new technique called familial searching, which retrieves a list of possible relatives of the owner of a particular DNA sample from the database, helped lead detectives to the murderer.

The case showed what a powerful tool familial searching can be. But its broader implications have been given little attention. For example, it brings with it the indirect lifelong surveillance of citizens simply because they are related to someone whose DNA profile is on record.

There are real fears that this could erode the privacy of a large number of people and could create new social divisions -- between families whose members have been subjected to DNA fingerprinting and the rest of society.

DNA databases worldwide are growing fast and a very large number of innocent people could be affected. This year the UK became the first country to permit the DNA profile of anyone arrested to be kept indefinitely, regardless of whether they are subsequently convicted. The UK database already contains DNA profiles of over 2 million people. On 2 November, Californians will vote on Proposition 69, which mandates the collection of the DNA profile of anyone who is arrested for a serious crime, whether subsequently convicted or not.

Familial searching will stretch the reach of these databases far beyond the individuals profiled in them. For every person in the database, their close relatives may be only a short calculation away. This means that within a few years a large proportion of the UK's population will be included, by association, in the database, even though they have never even been suspected of a crime, let alone convicted.

In the White case, the UK's DNA database happened to include the profile of the murderer's 14-year-old nephew -- who had not even been born when White was killed -- because he'd had dealings with the police. When DNA taken from the crime scene was tested against DNA profiles in the database the nephew was flagged up because he shared an

uncommon genetic marker with the person who had left their DNA at the crime scene. Detectives then tracked down his uncle, Jeffrey Gafoor, who admitted the murder. This case, together with a handful of others in the UK, New Zealand and North America, has led law enforcers to trumpet familial searching as an important new tool for investigating crimes.

Familial searching is based on the way we inherit our genes. Close relatives (especially parents, children and siblings) will share certain alleles -- versions of a particular gene -- which can act as genetic markers. Crime investigators can exploit this to compare crime scene DNA profiles with the profile of known individuals in the hope of finding a relationship between the two.

Three methods are available. Rare allele searching begins by looking for rare alleles in crime-scene evidence and then cross-referencing these alleles with profiles in a DNA database. Allele counting compares the overall number of alleles the crime-scene sample shares with database profiles across all regions of the genome. Kinship analysis combines these two approaches to rank in order of likelihood the people in the database who could be related to the owner of the crime-scene DNA.

The UK's Forensic Science Service now promotes familial searching to police forces in England and Wales as a way of tracking down perpetrators of serious crimes through their relatives. In North America, such searches occur informally at the local level.

There are still technical problems with familial searching. Indirect searches of national DNA databases can produce a list of hundreds of "potential relatives", none of whom, on closer inspection, turn out to be genetically related to the perpetrator. However, the scope and power of familial searching will increase as the cost of extracting genetic information drops, making it possible to retest DNA samples from convicts and arrestees to expand the repertoire of markers in DNA databases.

Soon it may be possible to routinely reach beyond close relatives, especially if the databases are extended to include Y chromosome markers, which are only transmitted through the generations from fathers to sons, and mitochondrial DNA sequences, which are transmitted by mothers to both sons and daughters.

In the UK,the inventor of DNA fingerprinting, Alec Jeffreys, recently argued that blanket profiling of the entire population would be the only fair way to avoid splitting society between those under permanent surveillance and those who are not. But is a blanket database a good idea? And should familial searching be allowed to develop? That debate should be open to the public now, otherwise familial searching will effectively produce a blanket database whether we like it or not.

LOAD-DATE: October 25, 2004