UK police use world's first DNA database and follow data protection rules

The world's first National DNA Database was established a year ago this month at the Forensic Science Service Headquarters in Birmingham. Police regard the National Database as the most significant advance in the use of forensic science against crime since the advent of fingerprints some 90 years ago. The Chief Constable of Cambridgeshire, Ben Gunn, the Chairman of the UK's Association of Chief Police Officers' DNA Database Group, explains how the system works.

DNA (Deoxyribonucleic Acid) is a complex chemical found in cells throughout the human body. It carries genetic information which determines the physical characteristics of a person. Everyone's DNA is unique, and everyone's DNA is the same in all of their cells.

It is important to remember that DNA, first discovered in the mid 1980's, is a powerful indicator of not just a person's guilt but also of their innocence.

The Dawn Ashforth case

The case in 1986 of Dawn Ashforth, whose body was found in Leicestershire, illustrates the point only too well. A youth aged 17 was arrested and admitted to her murder; only after DNA samples from him were compared with samples taken from the scene of the crime was it discovered that the youth could not have been responsible for the murder. Subsequently, another arrest was made and, following DNA comparisons, the man confessed to the murder of not just Dawn Ashforth, but also of another young woman in Leicestershire some three years earlier. DNA confirmed that the same person was responsible for both murders and a potential miscarriage of justice was averted.

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The issue of civil liberties

I mention this case at the outset because much has been made in the media over recent years about the effect that a National DNA Database might have on civil liberties. Police firmly believe that the National Database will be used not only to convict the guilty but also to acquit the innocent. In my view, that balance on the scales of justice is a powerful element in any civil libertarian argument.

The impetus to create the database

Both the police and the forensic science service have been pressing for a National Database for some years. That view was supported by the Royal Commission of Criminal Justice. Following the report of that Commission in 1993, the Home Secretary fully supported the initiative.

Further impetus for the creation of a National Database was provided by the Criminal Justice and Public Order Act 1994, which, in revising certain sections of the Police and Criminal Evidence Act 1984, allowed police to take non-intimate samples from anyone reported, cautioned, suspected or convicted of a recordable offence. (A recordable offence is a crime that attracts a sentence of imprisonment).

Profiling enables computer storage

The power to enable police to take non-intimate mouth swabs or rooted head hair, opened the way for a quick and easier method of obtaining DNA from a suspect even without their consent, provided, if consent was refused, an officer of the rank of Superintendent or above authorised it. By profiling those DNA samples from suspects through a new method of DNA analysis called Polymerase Chain Reaction using Short Tandem Repeats, it is possible to convert the analysis into a series of numbers, which can then be stored on a database.

By comparing database samples with those taken from the scenes of crime, it is possible to match potential suspects to crime scenes throughout the country.

DNA database's first year's results

In the first year of operation, 46,993 suspect samples and 3,606 scene of crime samples were placed on the database, taken from only three categories of offence:

- all offences against the person
- all burglaries
- all sexual offences.

In future years, as we broaden the scope to include all recordable offences, that figure could rise to about 5 million suspects on the database.

As a result of analyses carried out, the Forensic Science Service has made 462 suspect to crime scene matches and 354 matches between one crime scene and another.

Benefits of the National Database

In essence, the National Database means that police will be able quickly to identify somebody who commits an offence of, say, burglary in Newcastle with the same person if he then subsequently commits an assault in Exeter, providing, of course, that some forensic evidence is left at the scene and a DNA profile is recorded on the database.

This is even more important when you bear in mind that research has shown us, from the *Catchem* Project in Derbyshire, which looked at all cases of child homicides committed since 1960, that in more than half the cases of murder where the victim was a child or young woman, the offender had a previous conviction for assault or a sexually orientated minor crime. That research is supported by a Home Office Research Group Project, which showed that 90% of rape offenders had previous convictions for lesser offences, such as burglary, violence, theft, stealing cars or vandalism.

A National DNA Database will shorten some of the more serious crime investigations, which will improve our service to the public and reduce police costs.

DNA evidence only in a supporting role

Police do not view DNA as the single and sole piece of evidence in a case, although it could be in certain instances; rather, we regard it as a powerful indicator to a person's guilt or innocence which, in conjunction with other forensic evidence such as motive, witness statements, circumstantial evidence and other evidence like fingerprints, builds up a case which is capable of supporting a charge and obtaining a conviction. Over-riding all this is the essential requirement that the database must conform to the very rigorous demands of the Criminal Justice System, and meet the requirements of the burden of proof, which is "beyond reasonable doubt."

Statistical problems

Each person's DNA is unique (apart from identical twins), but of course, concerns have been raised about the reliability of the statistical interpretation in respect of a DNA analysis. Few seriously doubt the value of DNA itself but it is the interpretation statistically of the chance that a DNA sample relates to a single person that has come under scrutiny.

The DNA database has been set up using leading edge technology but, as science develops, new and more precise methods of analysis may be discovered. The database allows for migration of the current data contained on it to include data obtained by any new method of analysis.

Television programmes and discussion in the media has raised doubts on the reliability of DNA as evidence. Those programmes dwelt solely upon cases which involved older methods of analysis (multi locus probe and single locus probe) and not the new method of analysis which is the only method which will be used to access the DNA Database.

DNA Database facts

The DNA Database is located at the Forensic Science Service Headquarters in Birmingham. The organisation's staff will be the custodians and operators of the system for the next five years. The database is a national one for England and Wales and is essentially in two parts:

The suspect database

In addition to the DNA profile, the suspect database will contain the following details:

- a sample unique identification number;
- an arrest/summons number which provides a link to the Police National Computer Index of Criminal Records (PHOENIX);
- the subject's full name, sex, date of birth, ethnic origin;

- the Police Force and Station code;
- the name of the officer taking the sample.

The DNA profile database
This database will contain DNA profiles taken from the scenes of crime in the three categories of crime mentioned earlier throughout the country.

The DNA Database is a consolidated central database. It will not be partitioned by police forces, region, or on any other such basis. All police forces retain the ownership of the suspect samples which they submit to the Forensic Science Service.

Handling forensic samples

In essence, those samples principally will be

- saliva samples obtained by mouth swabs
- a plucked head hair, with or without consent
- a blood sample, which remains an intimate sample, taken by a doctor with consent.

In each and every case, two separate samples from suspects will be submitted to the database, each containing a unique reference number. They will be sent to the Forensic Science Service under controlled conditions, which include proper temperature considerations and controlled delivery processes. Strict quality control procedures are in force at Police Stations to ensure that the samples are uncontaminated and a tight supervision of those procedures has been created. On arrival at the Forensic Science Laboratory in Birmingham, similar quality control procedures are in force, both for the receipt of the samples and during the analytical process. The whole procedure is subject to the highest levels of quality assurance and the Forensic Science Service has achieved British Standard 5750 quality systems registration and National Measurements Accreditation Service accreditation covering scientific procedures. Similar safeguards are in force to ensure that *crime scene samples* are analysed in the same way through Forensic Science Laboratories at Aldermaston and Wetherby. The second suspect sample is retained for supplementary analysis, should the first sample prove to be faulty, or for separate analysis as required by the Criminal Justice System.

Results of profiling

These results will be electronically stored on the database as a digital record, in compliance with the Data Protection Act. It is important to emphasise that *the DNA National Database is an intelligence database only; it is not intended that the results of any analysis carried out solely for the database will be used for prosecuting purposes*.

Where a match is found between a suspect sample and a scene of crime sample, an entirely separate casework sample will be taken from the suspect and, following the high standards required by the Criminal Justice System, it is that sample that will be used for evidential purposes to prove the case at court.

Data Protection Act upheld

The database conforms to the strict requirements of the Data Protection Act, and also to the requirements of the national strategy for Police Information Systems. The DNA database has been registered under the terms of the Data Protection Act by the Forensic Science Service and all access to the database will be strictly controlled by the Forensic Science Service. All Police Forces and other agencies with a statutory investigative role (e.g. HM Customs, Post Office Investigations, Military Police), who use the database, will register their individual use of the data and the purpose for that use with the Data Protection Registrar.

The Forensic Science Service, as database custodian, have nominated a database system administrator, who maintains a list of authorised users registered with the Data Protection Registrar and also of those persons with direct access to the database.

Data security

Data will be held on a password protected system and the security will be layered, so that Data Protection Act requirements will be met; access will be to authorised operators only. According to the status of the accessor, this will allow:

- the addition of individual profiles and the associated unique identifiers;
- the addition of scene of crime samples and the associated unique identifiers;
- interrogation of the database.

Under the Data Protection Act, individuals whose profiles are entered on the database will have the right to a copy of any personal data

related to them. Standardised access procedures have been established by Chief Police Officers and the Forensic Science Service and endorsed by the Home Office.

Purpose of the registered system

The purpose of the registered system is as follows: to provide a national database of the DNA profiles of individuals suspected, reported, cautioned and convicted of a recordable offence. In addition, it may be used for internal management puposes, control and protection of the data and the investigation of complaints against police.

Each police force or registered user will have a designated DNA liaison officer, and access to data on the system will only be provided to Forces through that liaison officer, who is registered with the Forensic Science Service, in accordance with their policy and data protection registration. Data will only be addded to the database by the Forensic Science Service when received from Police Forces and other agencies registered as users of the database.

Accuracy

The importance of absolute accuracy cannot be over-emphasised. There are extremely rigorous procedures for taking samples and transferring them to the laboratory, and all the Forensic Science Service handling and analytical procedures to profile the samples must be able to stand up to close scrutiny by the court. Much effort has gone into training and the supervision of these aspects. Samples that fail to arrive in a satisfactory condition at the Forensic Science Service Laboratory, or without proper identification, or where the chain of handling is in doubt, will be rejected.

Duration and weeding

All records on the DNA database will be retained for the same period as the offender's criminal record exists on the National Index of Criminal Records (Phoenix). Weeding will be triggered by information recording case results, or the death of the individual, when notified from the Police Criminal Record System. Weeding will be conducted by the Forensic Science Service on receipt of the necessary information from the Police Service. Regular audits will be undertaken to ensure that the weeding processes are carried out.

In respect of samples obtained from crime scenes, the database record of that sample will be retained until the offender has been convicted. If convicted, his or her sample will then be retained on the database as described, but the crime scene sample will be removed on conviction. If a suspect has been found *not* to be involved in a crime, their sample will be removed from the database.

Maintaining high standards

This is the world's first National DNA Database. It is a major venture and it significantly enhances the police's ability to identify suspects for crime. Other law enforcement agencies around the world are very interested in our database.

> "This is a significant advance in the use of forensic science and technology to fight crime"

We acknowledge the need for the highest standards of procedures in both the collection, analysis and storage of DNA profiles. Every effort has been taken to ensure that those standards are met and that the database and the information/evidence obtained therefrom will stand up to the rigorous standards of proof required by a Criminal Justice System. It is in all our interests, both from the operational and the data protection issues involved, that the database can withstand the closest scrutiny.

This is a significant advance in the use of forensic science and technology to fight crime. It is an exciting prospect and we feel that it will help us to tip the balance more towards catching and convicting the criminal.

This report is an edited and updated version of the presentation by D. G. Gunn, QPM, MA (Cantab), Chief Constable, Cambridgeshire Constabulary at the *Privacy Laws & Business 8th Annual Conference*, St. John's College, Cambridge on 10th July, 1995.