Spread of DNA databases sparks ethical concerns

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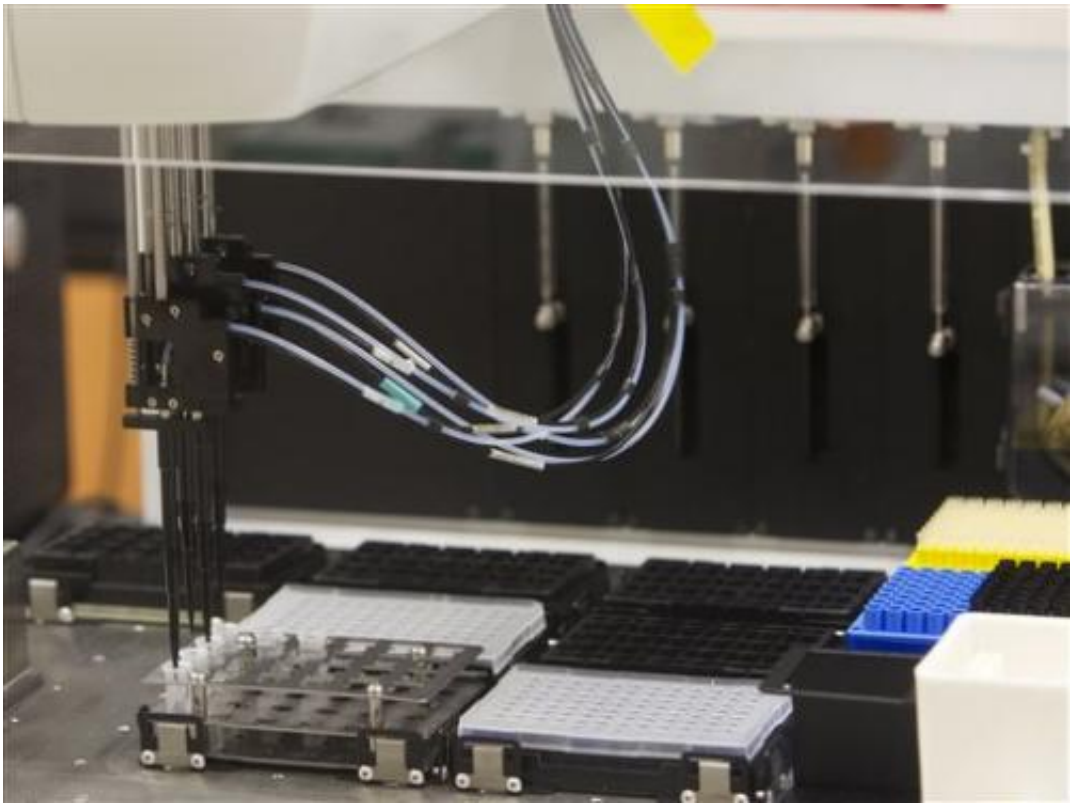

In this Friday, March 2, 2012 file photo, DNA samples are processed at the New York State Police Forensic Investigation Center in Albany, N.Y. Countries around the world are collecting genetic material from millions of citizens in the name of fighting crime and terrorism. Few nations have been more enthusiastic than Britain, where a database of DNA from criminal suspects grew by 2012 to hold samples from almost 7 million people, more than 10 percent of the population. (AP Photo/Mike Groll, File)

You can ditch your computer and leave your cellphone at home, but you can't escape your DNA. It belongs uniquely to you—and, increasingly, to the authorities.

Countries around the world are collecting genetic material from millions of citizens in the name of fighting crime and terrorism—and, according to critics, heading into uncharted ethical terrain.

Leaders include the United States—where the Supreme Court recently backed the collection of DNA swabs from suspects on arrest—and Britain, where police held samples of almost 7 million people, more than 10 percent of the population, until a court-ordered about-face saw the incineration of a chunk of the database.The expanding trove of DNA in official hands has alarmed privacy campaigners, and some scientists. Recent leaks about U.S. surveillance programs by former NSA systems analyst Edward Snowden have made people realize their online information and electronic communications may not be as secure as they thought. Could the same be true of the information we hold within our genes? DNA samples that can help solve robberies and murders could also, in theory, be used to track down our relatives, scan us for susceptibility to disease, or monitor our movements.

Earlier this year Yaniv Erlich, who runs a lab at MIT's Whitehead Institute for Biomedical Research, published a paper in the journal *Science* describing how he was able to identify individuals, and their families, from anonymous DNA data in a research project. All it took was a computer algorithm, a genetic genealogy website and searches of publicly available Internet records.

"It was a very weird feeling—a 'wow' feeling," Erlich told The Associated Press. "I had to take a walk outside just to think about this process."

Erlich says DNA databases have enormous positive power, both for fighting crime and in scientific research. But, he said, "our work shows there are privacy limitations."

Few would disagree about the power of DNA to catch criminals—and to clear the innocent. Hundreds of wrongly convicted people around the world have been freed thanks to DNA tests. A recent AP investigation found that at least 24 men in the United States convicted of or charged with murder or rape based on bite marks on the flesh of victims have been exonerated since 2000, thanks to DNA evidence.

Ethical qualms have done little to stop the growth of genetic databases around the world.

The international police agency Interpol listed 54 nations with national police DNA databases in 2009, including Australia, Canada, France, Germany and China. Brazil and India have since announced plans to join the club, and the United Arab Emirates intends to build the world's first database of an entire national population.

The biggest database is in the United States—the FBI's Combined DNA Index System, or CODIS, which holds information on more than 11 million people suspected of or convicted of crimes.

It is set to grow following a May Supreme Court ruling that upheld the right of police forces to take DNA swabs without a warrant from people who are arrested, not just those who are convicted. (Policies on DNA collection vary by state; more than half of the states and the federal government currently take DNA swabs after arrests.)

The court's justices were divided about implications for individuals' rights. Justice Anthony Kennedy, for the five-judge majority, called the taking of DNA a legitimate and reasonable police booking procedure

akin to fingerprinting.

But dissenting Justice Antonin Scalia argued that it marked a major change in police powers. "Because of today's decision, your DNA can be taken and entered into a national database if you are ever arrested, rightly or wrongly, and for whatever reason," he said.

A similar note of caution has been struck by Alec Jeffreys, the British geneticist whose 1984 discovery of DNA fingerprinting revolutionized criminal investigations. He has warned that "mission creep" could see authorities use DNA to accumulate information on people's racial origins, medical history and psychological profile.

Erlich agreed that scenario was possible, if not likely.

"If it's not regulated and the police can do whatever they want ... they can use your DNA to infer things about your health, your ancestry, whether your kids are your kids," he said.

Police forces have already tracked down criminals through the DNA of their innocent relatives, a practice that is both a goldmine for investigators and, according to skeptics, an ethical minefield. Charles Tumosa, a clinical assistant professor in forensic studies at the University of Baltimore who is wary of the potential for genetic surveillance, says relatives of suspects could be identified through DNA and leaned on for information about their family members.

"There's got to be a debate," said Tumosa. "Nobody has talked this out.

"At what point do you say, enough is enough? Do we want to have a society where 5 percent of the crime is unsolved, or do we want to have a society where 100 percent of the crime is solved" but privacy is compromised. "What's the trade-off?"

And yet familial DNA searches have helped solve terrible crimes. In Kansas in 2005, police identified Dennis Rader as a serial killer known as "BTK" through his daughter's DNA obtained, without her knowledge, from a pap smear in her medical records.

Investigators in Massachusetts say advances in DNA technology may finally establish beyond doubt the perpetrator of the 1960s Boston Strangler slayings. They plan to exhume the body of longtime suspect Albert DeSalvo—who confessed to the crimes but was never convicted—after DNA from one of the crime scenes produced a familial match with him.

Both supporters and critics of DNA databases point to Britain, where until recently, police could take the DNA of anyone 10 or older arrested for even the most minor offense—and keep it forever, even if the suspect was later acquitted or released without charge.

Police say the database has helped solve thousands of crimes, including murders and rapes. On the other side of the coin are hundreds of thousands of innocent people, including children, who feel shamed and tainted by inclusion on a database of criminal suspects—a status some legal experts say undermines the presumption of innocence.

"A lot of British people were very shocked to find themselves or their children ending up on the database for minor alleged offenses such as throwing a snowball at a car," said Helen Wallace, director of the privacy group GeneWatch, which campaigns for restrictions on collection of DNA and other personal information.

After a long legal battle—waged in part by a youth who was arrested at 11 on suspicion of attempted robbery and had his DNA retained despite being acquitted—the European Court of Human Rights ruled in 2008 that Britain's "blanket and indiscriminate" storage of DNA violated the

right to a private life.

The U.K. was forced to trim its huge database. Under a law passed last year known as the Protection of Freedoms Act, the government is destroying the DNA profiles—strings of numbers derived from DNA samples that are used to identify individuals—of a million people who were arrested for minor offenses but not convicted. People acquitted of serious crimes have their DNA profiles kept for up to five years.

Britain also has incinerated more than 6 million physical DNA samples—mostly swabs of saliva—taken from suspects. Samples, which could previously be kept indefinitely, must now be destroyed after six months.

Destroying the samples is seen as key to limiting DNA databases to crime-fighting rather than snooping, because it means stored DNA cannot be used to trace relatives or susceptibility to disease.

The U.K. government says the curbs have restored a sense of proportion to Britain's database, but some aspects of the country's genetic monitoring remain murky.

The U.K. DNA ethics watchdog has expressed concerns about a secret counterterrorism database, which, according to the Metropolitan Police Authority, contains "DNA obtained through searches, crime scenes and arrests in relation to counterterrorism"—including samples from people stopped and questioned at ports and borders, even if they are not arrested.

The Home Office, which oversees police and the DNA database, said there was a "robust regulatory framework" for the counterterrorism database. But it would not disclose how large it is, who has access to it or whether the information is shared with other countries.

Some authorities on DNA say fears of genetic intrusion are misplaced.

Chris Asplen, a former assistant U.S. attorney who now heads the Global Alliance for Rapid DNA Testing, argues that DNA is not dramatically different from other information the authorities already hold about millions of people, such as fingerprints, social security numbers or automobile registrations.

But he does see avenues for abuse.

"There is an argument to be made that because that biological sample exists, the government could go back and do other things with it that are not authorized by the law," he said. "It's a constant tension between government and people, particularly when technology is applied."