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FBI discloses errors in DNA analysis

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Problems date to 1999, but the results are still solid, the agency says

The FBI has notified crime labs across the country that it has discovered errors in data used by forensic scientists in thousands of cases to calculate the chances that DNA found at a crime scene matches a particular person, several people familiar with the issue said.

The bureau has said it believes the errors, which extend to 1999, are unlikely to result in dramatic changes that would affect cases. It has submitted the research findings to support that conclusion for publication in the July issue of the *Journal of Forensic Sciences*, the officials said.

But crime labs and lawyers said they want to know more about the problem before conceding it would not make much difference in any given case.

"The public puts so much faith in DNA testing that it makes it especially important to make those the best estimates possible," said Wright State University statistics professor Daniel R. Krane, an expert whose work has been cited by defense attorneys. "There is no excuse for a systematic error to many thousands of calculations in such a context."

Krane, who identified errors 10 years ago in the DNA profiles the FBI analyzed to generate the population statistics data, called the consequences of the disclosure appalling, saying the data has been used in tens of thousands or hundreds of thousands of cases worldwide in the past 15 years. He said when he flagged the problems a decade ago, the FBI downplayed his findings.

The issue centers on the FBI's "Pop stats," which are built into the software programs used by 9 in 10 U.S. labs and many overseas, Krane said.

While juries might well reach the same decision if errors mean that an individual has a 1-in-a-billion chance of matching a crime scene sample instead of 1 in 10 billion, for example, that may not be so if errors were to halve, say, assertions that person had a 1-in-180 chance of matching, as Krane said came up in a case that he testified in last week.

Such low ratios are increasingly common as state and local labs analyze smaller and smaller traces of DNA found on objects such as guns or countertops — known as "low-copy" and "touch DNA" — and often are sifting through DNA mixtures, or profiles contributed by multiple people. Stephen Mercer, chief of the forensic division of Maryland's Office of the Public Defender, said his office on Wednesday notified its attorneys about the issue and suggested they consider asking prosecutors about such problems in cases involving DNA evidence.

"The prediction that the errors are likely to have a nominal impact has to be assessed by the defense in the individual circumstances of each particular case," Mercer said.

In a bulletin sent to crime labs, the FBI said the problem stemmed from "clerical mistakes in transcriptions of the genotypes and to limitations of the old technology and software."

The disclosure comes as some private researchers and lawyers in recent years questioned whether errors in the FBI's national database of 13 million DNA profiles may have led judges and juries to give undue weight to DNA matches, long considered the "gold standard" in forensic science.

Crime lab analysts in the United States generally develop a DNA profile by analyzing 13 or more specific locations on chromosomes, called loci, for specific markers that appear at different frequencies in a given population. Match probabilities are derived by calculating the likelihood of a person sharing the same markers at each point.

The FBI is preparing to transition to using more than 20 loci, which theoretically should significantly improve the accuracy of results and allay concerns about the population statistics it used to generate those frequencies, officials said.

With new commercial test kits available using more loci, the FBI commissioned a study that retested DNA samples used for its original work and uncovered the errors.

"We are of the view that these discrepancies are unlikely to materially affect any assessment of evidential value," the FBI stated in its May 11 bulletin to crime labs, according to a person who has a copy. "However, given that statistics based on these data have been included in thousands of lab reports and in testimonies, we believe the discrepancies require acknowledgment."

In a public statement late Friday, the FBI said it found errors in 33 of 1,100 profiles used, or 3 percent. The FBI added that the DNA community has cautioned that match probabilities should be

viewed as varying by a factor of 10, saying, "Though these discrepancies are within the internationally accepted range, the FBI is committed to correcting the inaccurate values in a transparent manner."

The FBI has prepared a letter to the editor to be published by the Journal of Forensic Sciences, which originally published the bureau's study 16 years ago.

David Coffman, chairman of the accreditation arm of the American Society of Crime Lab Directors, said it would be premature to comment on the significance of the errors until the FBI releases more data.

"They said it would be very minor," said Coffman, who is director of forensic services for the Florida Department of Law Enforcement in Tallahassee. "We are waiting to see the journal article to see which [data] would be affected, so we could evaluate it."

In a statement, the National District Attorneys Association applauded the "transparent and responsible manner in which the FBI has disclosed this internal finding," adding that "notification to all interested parties is an excellent first step in addressing this issue."