



Crime Laboratory Digest

In This Issue

*The Outlook for Forensic DNA Testing in the
United States*

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The Outlook for Forensic DNA Testing in the United States

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Since November 1987, when forensic DNA tests results were first used in the United States to obtain a criminal conviction (*State of Florida v. Tommie Lee Andrews*), the law enforcement and forensic science communities have moved quickly to embrace DNA analysis as an important and powerful new tool for investigating sex-related and violent crimes.

This article examines the outlook for forensic DNA testing in the United States over the next several years. Most of the data supporting the findings on current practice and future prospects for DNA analysis came from a telephone survey of crime laboratory directors conducted by the FBI Laboratory during June 1990. This survey explored the current status of and plans for DNA testing by state and local crime laboratories.

The other major source of data is Genetic Witness: Forensic Uses of DNA Tests (1990), a study by the U. S. Congress, Office of Technology Assessment (OTA) which contains the results of a similar survey, though more limited in scope, conducted by the OTA in early 1989. In several instances, the answers to similar questions from the two surveys are presented together to depict the rapidly changing attitudes regarding DNA analysis throughout the crime laboratory community. Both surveys used the FBI's Directory of Crime Laboratories as the sample population and both sampled every non-Federal crime laboratory listed in the directory. The FBI survey, however, was a telephone survey with a 100% response rate, while the OTA survey was conducted by mail with an 85% response rate.

SURVEY FINDINGS

Crime laboratories in the United States have embraced DNA typing as an important additional forensic analysis tool in their fight against violent and sex-related crime. Nearly all crime laboratories now believe in the importance of DNA analysis to the law enforcement and forensic science communities. DNA testing is seen as a highly discriminating technique for identifying (or excluding) a suspect in cases involving biological evidence.

Most crime laboratory directors believe there are potential problems in implementing widespread use of DNA analysis due to the lack of properly trained DNA examiners, the high costs necessary to establish a DNA laboratory, and the difficulties encountered when introducing DNA evidence in court.

Twenty-seven percent of crime laboratories in the United States currently have legislative authority to establish a database to match DNA profiles, and 65% believe they will have such authority within the next 2 years.

Crime laboratories are not waiting to develop their own in-house capability to take advantage of forensic DNA analysis. Eighty-one percent of laboratories either currently conduct DNA analysis (5%) or send DNA cases to outside laboratories (76%).

The reasons cited most frequently by crime laboratories for not conducting DNA analysis themselves are the lack of necessary personnel, insufficient space or equipment, insufficient budget resources, and insufficient case load or local demand for DNA testing to justify establishment of a DNA laboratory. Other obstacles include the lack of (or difficulty in obtaining) a Nuclear Regulatory Commission (NRC) license for handling radioactive materials, the length of time necessary to become operational, and the unavailability of DNA analysis training.

The FBI Laboratory began to accept DNA cases in December 1988. It has since become the most widely used forensic DNA testing laboratory in the United States, with 61% of the crime laboratories that conduct DNA analysis sending cases to the FBI. Lifecodes and Cellmark are also high-volume DNA laboratories, with the other 39% of crime laboratories sending cases to either of them.

Where resources are available and crime laboratories can justify having their own DNA analysis capability, laboratory directors are proceeding to acquire the staff, equipment and experience necessary to establish local facilities for DNA testing.

Twenty-five of the crime laboratories surveyed are currently either conducting DNA analysis, or they are completing the steps necessary before accepting forensic DNA cases. All but three of these laboratories are using the FBI method for DNA analysis to the extent that is necessary to allow sharing of DNA profiles in a national database.

When asked about the likelihood that they will be conducting DNA analysis within the next 3 years, two-thirds of the laboratories currently sending DNA cases outside say it is very likely or somewhat likely that they will be performing DNA analysis in-house within 3 years. When that subset of laboratories was asked specifically the year in which they expect to come on-line, only 40% said they expect to be performing DNA analysis before the end of 1992. The apparent incongruity of these results can be interpreted as an implicit understanding by laboratory directors of the tremendous amounts of time and effort needed to establish a forensic DNA laboratory and that, while there is a desire to develop an in-house DNA analysis unit, implementing such an initiative will probably take longer than 2 to 3 years. Another obvious inference to be drawn from these results is the inexorable and extensive movement toward forensic DNA analysis that will be occurring during the next several years, especially by laboratory systems and larger single laboratories.

The demand for forensic DNA testing continues to grow as more crime laboratories gain experience with it and there is more widespread acceptance of DNA evidence by the courts. A major complaint by state and local crime laboratories about sending DNA cases to the FBI is that it often takes 6 to 8 months to receive results. Some relief is forthcoming, however, because the FBI recently doubled its capacity for DNA testing, and more state and local crime laboratories are nearly ready to begin working DNA cases locally. The potential exists, therefore, that the FBI will be able to provide DNA analysis services to smaller laboratories as larger crime laboratories bring their own capabilities on-line. Unfortunately, this may take several years to occur.

There is overwhelming recognition and acceptance for the FBI Laboratory to play a leadership role in the forensic science community to help develop and proliferate forensic DNA testing. A nearly unanimous agreement exists about the FBI's role as leader in DNA testing, conducting research on DNA analysis methods, providing DNA-related training to state and local examiners, maintaining centralized files for a national DNA database, and developing related software and automated tools for use by state and local crime laboratories.

However, some concern exists among crime laboratories about the potential role of the FBI Laboratory regarding standards and quality control. In these areas, the FBI's proper role is viewed as a facilitator and provider of a forum for building consensus, rather than as the place from which standards would be issued to govern the way crime laboratories conduct DNA testing. Any attempt to establish mechanisms for proficiency testing, defining standards or certifying laboratory personnel would have to be perceived as helpful but not threatening to the independence and autonomy of state and local crime laboratories.

The DNA training provided by the FBI is generally well received and valued throughout the forensic science community. The training, which is free to crime laboratories, is considered essential to efforts to proliferate DNA analysis technology. To obtain the greatest benefits from the initial training, most crime laboratories believe the FBI should offer a follow-up course to prepare DNA examiners to testify in court as expert witnesses.

Finally, the survey reveals that the development of an easier and faster means to perform DNA analysis which is as discriminating as the current FBI method would significantly increase adoption of DNA analysis by crime laboratories. However, until an alternative DNA testing procedure is available, the adoption of DNA analysis can be intensified by improved access to the FBI's DNA training, implementation of a national DNA database and increased awareness of DNA technology throughout the law enforcement and crime laboratory communities.

ONGOING EFFORTS BY THE FBI LABORATORY

The FBI Laboratory began researching DNA typing methods in 1985. In July 1987 a research team was established at the Forensic Science Research and Training Center (FSRTC) in Quantico, Virginia to develop a DNA analysis method for use by the FBI Laboratory. Since that time, the FBI Laboratory also has been pursuing several initiatives to help transfer DNA analysis technology to the crime laboratory community. These initiatives include research and development of proven and reliable methods for DNA typing, training of state and local crime laboratory personnel, sponsoring the Visiting Scientist Program in which forensic scientists collaborate on DNA-related research projects, conducting casework on DNA samples submitted by state and local crime laboratories, providing expert testimony to gain admission of DNA test results in various courts and establish precedents for its general acceptance, and laying the groundwork for a national exchange of DNA profiles to aid criminal investigations.

In addition, the FBI Laboratory regularly publishes the results of ongoing research and development of DNA analysis methods. It has also hosted periodic seminars, including two international symposia on forensic DNA testing. The FBI Laboratory sponsors the Technical Working Group on DNA Analysis Methods (TWGDAM), an ongoing forum for DNA-trained personnel from state and local crime laboratories, to foster and promote the exchange of technical information on DNA testing procedures to help establish standards and guidelines for use by forensic DNA laboratories. TWGDAM meets several times each year and is comprised of scientists from forensic laboratories, private industry and academia.

The FBI Laboratory also works closely with the American Society of Crime Laboratory Directors (ASCLD) to coordinate policy issues regarding the nationwide implementation of DNA testing. Quality assurance guidelines for forensic DNA testing were issued by TWGDAM and endorsed by ASCLD for use in crime laboratories throughout the United States. Adherence to these guidelines is considered by some courts as a major factor in determining admissibility of DNA test results as forensic evidence. In addition, TWGDAM guidelines for DNA proficiency testing were published in the July 1990 issue of the Crime Laboratory Digest.

The DNA Analysis Unit at FBI Headquarters in Washington, D. C. conducts DNA tests on forensic samples submitted by state and local crime laboratories throughout the United States. As with other forensic testing services provided by the FBI Laboratory, DNA testing is free of charge to the requesting law enforcement agency. Part of this free service includes the rendering of expert testimony by FBI examiners to assist in the prosecution of criminal cases involving DNA. In its first year of operation, the DNA Analysis Unit accepted over 1,000 cases, each requiring analysis of several DNA samples. During 1990, the laboratory space and staff were doubled to cope with the tremendous demand for DNA testing services, currently about 1,500 cases per year.

SURVEY APPROACH

Survey Response: During late May and early June 1990, each non-Federal crime laboratory listed in the FBI's Directory of Crime Laboratories was contacted in a telephone survey regarding the current status and plans for DNA analysis in each laboratory. At the time of the survey, the directory listed 296 separate crime laboratory facilities or locations. A total of 177 responses were obtained, consisting of 146 single laboratories and 31 laboratory systems (representing 150 individual laboratories), providing a 100% participation rate by state and local crime laboratories in the United States.

Interviewees: The Laboratory Director was the person interviewed in most, but not all cases. The interviewers were instructed to find the person in each laboratory or laboratory system "most responsible for planning and managing DNA analysis activities." Often, particularly for laboratory systems, someone other than the director was in charge of or more knowledgeable about DNA-related activities — and that person was interviewed. As a result, 94% of the respondents rated themselves as very informed or somewhat informed about DNA analysis.

ATTITUDES ABOUT DNA ANALYSIS

Importance of DNA Analysis: Both the FBI and OTA surveys sought to gauge the perceived importance of DNA analysis to crime laboratories and the law enforcement community. In response to very similarly worded questions, 99% of the respondents to the FBI survey now consider DNA analysis to be very important or somewhat important to the law enforcement and forensic science communities, compared to 93% in the OTA survey last year.

Table 1. Importance of DNA Analysis

Importance of DNA Analysis	Percent of Laboratories	
	FBI Survey (June 1990)	OTA Survey (March 1989)
Very important	90	78
Somewhat important	9	15
Not very important	1	5
No answer/Don't know	0	2

SOURCES: Federal Bureau of Investigation, 1990; Office of Technology Assessment, 1990.

Major reasons for the considered importance of DNA analysis were its ability to identify or exonerate suspects in concrete terms (59%) and its specificity in determining the origin of stains or body fluids (20%). Other similar responses were that DNA analysis provides more discriminating results than traditional serological tests, it can provide positive identification in sex-related or violent crimes, and it permits the establishment of a national database.

Perceived Drawbacks for DNA Analysis: Sixty-six percent of the survey respondents believe there are potential problems or drawbacks related to DNA analysis, including 74% of the respondents from laboratory systems. The most frequently mentioned drawbacks are the need for properly trained DNA examiners, the tremendous amounts of time and money necessary to establish a DNA laboratory, and the obstacles which must be overcome to convince courts, defense attorneys and the public of the accuracy and reliability of DNA analysis. There was no sentiment expressed, however, that these negative factors justify not proceeding to implement DNA testing, only that there are costs and extra effort required for success.

STATUS OF DNA ANALYSIS

The topics covered in this section of the survey include the existence or anticipation of a legislative mandate to perform DNA analysis, the role of DNA analysis in crime laboratories (including whether DNA analysis is performed in-house or contracted out), and obstacles that may exist to performing DNA analysis.

Legislative Mandate: Approximately 27% of the respondents said they currently have legislative authority or a mandate to construct a database for their respective jurisdictions to match DNA profiles. Laboratories without current authority were then asked if they believe such authority or mandate is likely within the next 2 years, to which 38% said yes. Importantly, 59% of the laboratory systems without current authority believe they will have such authority within the next 2 years.

Table 2. Legislative Authority to Construct Database to Match DNA Profiles

Degree of Legislative Authority	Percent of Laboratories		
	Combined	Laboratory System	Single Laboratory
Laboratories that currently have legislative authority or mandate to construct database to match DNA profiles	27	29	26
Laboratories without current authority that believe such authority is likely within next 2 years	38	59	33
Laboratories that don't know or are unsure about legislative authority	35	12	41

SOURCE: Federal Bureau of Investigation, 1990.

Prevalence of DNA Analysis: A major objective of the survey was to determine how many crime laboratories in the United States currently conduct DNA analysis, regardless of whether it is performed in-house or contracted out. Eighty-one percent of the respondents said they currently conduct DNA analysis themselves or send DNA case samples to the FBI or private laboratories for analysis. There was no difference between single laboratories or laboratory systems regarding the frequency of DNA cases. Only 5% of the respondents reported that they are currently performing DNA analysis themselves. As will be shown later, however, the percentage of crime laboratories performing DNA analysis in-house will probably increase dramatically in the next 2 years, as more laboratories complete training and implementation efforts to come on-line.

By way of contrast, at the time of the OTA survey (1990), 47% of the crime laboratories were sending DNA evidence to outside laboratories, while only one laboratory in Virginia was then performing DNA analysis in-house.

Table 3. Prevalence of DNA Analysis

Prevalence	Percent of Laboratories		
	Combined	Laboratory System	Single Laboratory
Laboratories not currently conducting DNA analysis	19	19	19
Laboratories currently conducting DNA analysis, either in-house or contracting out	81	81	81
DNA analysis performed in-house by laboratory personnel	5	6	5
DNA analysis contracted out to FBI or private laboratories	76	75	76

SOURCE: Federal Bureau of Investigation, 1990.

Admissibility of DNA Typing: Among the crime laboratories surveyed that conduct DNA analysis, 89% had used DNA test results in at least one case. All of the laboratory systems reported using DNA typing in at least one case. Of the respondents that reported using DNA evidence, 76% indicated that DNA testing was decisive in resolving cases, and among these same laboratories, 58% said DNA evidence has undergone *Frye* hearings or other formal determinations of admissibility as forensic evidence.

Laboratories Performing Forensic DNA Analysis: Of the laboratories reporting that they send DNA cases out, more reported sending cases to the FBI Laboratory than any other outside laboratory. The survey indicates that there are currently three major providers of forensic DNA testing in the United States (FBI, Cellmark and Lifecodes), plus a significant number of second-level providers. Sixty-one percent of the crime laboratories conducting DNA analysis send cases to the FBI Laboratory, while approximately half send DNA cases to either Cellmark (52%) or Lifecodes (49%). Many crime laboratories send DNA cases to more than one outside laboratory, depending on the circumstances of a given case.

The OTA survey (1990) showed that as of early 1989, the three major providers of forensic DNA testing were Lifecodes (65% of laboratories reported sending cases), Cellmark (48%), and Forensic Science Associates (21%). At that time, the FBI Laboratory was counted among "other laboratories." The FBI Laboratory began accepting DNA cases in December 1988, and at the time of the OTA survey (March 1989), many crime laboratories had not yet used the service.

Table 4. Sources of Forensic DNA Testing

Outside DNA Laboratories	Percent of Laboratories Sending Out DNA Cases	
	FBI Survey (June 1990)	OTA Survey (March 1989)
FBI Laboratory (Washington, DC)	61	N/A
Lifecodes (Valhalla, NY)	49	65
Cellmark (Germantown, MD)	52	48
Forensic Science Associates (Richmond, CA)	5	21
Cetus* (Emeryville, CA)	5	N/A
Others	13	22

Note: "Others" include Genescreen (Dallas, TX), Baylor University Medical School (Houston, TX) and other state and local crime laboratories.

*Although some respondents said they send DNA cases to Cetus, in fact, Cetus does not perform forensic DNA testing. Their proprietary DNA analysis method, PCR/DQ-alpha, is used by Forensic Science Associates and other laboratories.

SOURCES: Federal Bureau of Investigation, 1990; Office of Technology Assessment, 1990.

Reasons for Not Conducting DNA Analysis: Respondents from crime laboratories that send DNA cases to outside laboratories were asked why they do not perform DNA testing themselves. The most frequently mentioned reasons are listed in Table 5.

Table 5. Reasons Crime Laboratories Do Not Perform DNA Testing

Laboratory Characteristic	Percent
Lack of necessary personnel	75
Insufficient space/equipment	69
Insufficient budget resources	69
Insufficient case load/demand for DNA testing	24
Waiting for current methodology or problems to be resolved	8
Waiting for total acceptance in court	4

SOURCE: Federal Bureau of Investigation, 1990.

Obstacles to Conducting In-house DNA Analysis: All respondents were asked about their opinions of possible obstacles for a crime laboratory to establish an in-house capability for DNA testing. Table 6 shows how many respondents believe each potential obstacle is a very severe or somewhat severe problem.

Table 6. Potential Obstacles to Becoming a Forensic DNA Testing Laboratory

Potential Problem	Percent of all Respondents Believing Potential Problem is		Total
	Very Severe	Somewhat Severe	
Lack of laboratory equipment	32	15	47
Lack of laboratory supplies	20	16	36
Lack of NRC license	11	7	18
Lack of qualified laboratory technicians	27	20	47
Lack of qualified examiners and testifiers	27	23	50
Length of time to become operational	24	26	50
DNA analysis training	17	23	40

SOURCE: Federal Bureau of Investigation, 1990.

Laboratory Readiness to Perform DNA Testing: The survey shows that nine crime laboratories or laboratory systems are currently conducting DNA analysis in-house. Eleven additional respondents indicated they are preparing to begin accepting forensic DNA cases but are still completing training, proficiency testing, development of population data databases (for statistical analysis of forensic DNA results) or similar steps in final preparation for coming on-line and accepting DNA cases. Five more respondents said they are in the process of modifying space, waiting for DNA-related equipment to arrive, or conducting other activities that would permit them to perform population studies or validate the DNA analysis method in their laboratories. Table 7 shows for each category of readiness, the number of laboratories that have been trained in the FBI's DNA analysis method (RFLP/Hae III) and have indicated their commitment to using the FBI protocol in forensic DNA casework.

Table 7. Laboratory Readiness to Perform DNA Testing

Degree of Readiness to Perform Forensic DNA Analysis	Number of Respondents	Uses FBI Protocol
Laboratories conducting DNA testing in-house	9	6
Final stages of readiness before coming on-line (population studies, validation, proficiency testing, etc.)	11	11
Early stages of readiness (DNA training complete, but awaiting space modification, delivery of equipment and other necessary resources)	5	5

SOURCE: Federal Bureau of Investigation, 1990.

Plans to Develop In-house Capability for DNA Analysis: Respondents that are currently sending DNA cases to outside laboratories were asked about the likelihood that they would be performing forensic DNA casework in their laboratories within the next 3 years. Nearly half (47%) said they are very likely to be performing DNA analysis within 3 years, and another 20% said it is somewhat likely that they will be — for a total of 67% of laboratories currently sending out DNA cases. Larger single laboratories and laboratory systems were more likely to say they expect to be performing DNA analysis within 3 years.

Table 8. Likelihood of Developing DNA Analysis Capability

	Percent of Laboratories		
	Very Likely	Somewhat Likely	Total
Crime laboratories currently sending DNA cases outside that anticipate performing DNA testing in-house within 3 years	47	20	67

SOURCE: Federal Bureau of Investigation, 1990.

Table 9 displays the projected years in which laboratories expect to begin performing DNA testing in-house. The data show that interest in developing an in-house capability for DNA analysis is increasing dramatically and will not abate until after 1992.

Table 9. Projected Year for Beginning DNA Analysis by Laboratories Currently Sending Out DNA Cases

Year	Number of Organizations	Percent of Total	Number of Labs Represented	Percent of Total
1990	16	10	41	15
1991	29	17	72	26
1992	21	13	29	10
1993	14	8	21	8
1994/95	5	3	9	3
Total	85	51	172	62

Note: Percentages are of total laboratories or laboratory systems not currently conducting forensic DNA analysis (that is, 168 organizations representing 279 individual laboratories).

SOURCE: Federal Bureau of Investigation, 1990.

FBI ROLE IN DNA ANALYSIS

Consensus Areas for FBI Role: Both the FBI and OTA surveys assessed the attitudes of state and local crime laboratory directors regarding the role the FBI should play in forensic DNA analysis and testing. Each survey found overwhelming support for the FBI in conducting research on DNA analysis methods, training of state and local DNA examiners and maintaining centralized files for a national DNA database.

When asked if they "welcome or invite the FBI to play a leadership role in developing and proliferating DNA analysis technology," nearly all respondents (98%) answered yes. In addition, the FBI survey showed tremendous support for the idea that the FBI Laboratory should develop and provide DNA-related software and automation tools that are useful to state and local crime laboratories in establishing their own DNA analysis facilities.

Table 10. Possible Roles for the FBI in DNA Analysis

Role for FBI Laboratory	Percent of Respondents Answering Yes	
	FBI Survey (June 1990)	OTA Survey (March 1989)
Leadership in DNA testing	98	N/A
Research on DNA analysis methods	99	96
Training of state and local DNA examiners	100	95
Casework for state and local crime laboratories	N/A	63
Maintenance of centralized files for national DNA database	96	88
Develop DNA-related software and automated tools for use by state and local laboratories	98	N/A

SOURCES: Federal Bureau of Investigation, 1990; Office of Technology Assessment, 1990.

Setting Standards for DNA Laboratories: The OTA survey found a lower overall level of acceptance of the FBI's role in areas related to standards and quality control than for other areas. The OTA report (1990) summarized the issue as follows:

"For the issue that many believe is the most pressing one facing forensic applications of DNA typing — that of defining standards — a minority of crime laboratories . . . (48% of respondents) proposed a role for the FBI. Moreover, some laboratories expressed serious concern about FBI involvement in this issue. They indicated that professional groups and forensic science associations should handle this, with the FBI helping to coordinate."

The OTA survey (1990) asked whether the FBI should be providing proficiency samples for quality assurance of DNA laboratories (55% of the respondents answered yes), defining standards (48%) and certifying laboratory personnel (24%). These findings are not surprising, given the traditional independence of criminalists throughout the forensic science community, combined with the opinion that the FBI Laboratory's role should be to assist in developing and transferring forensic testing methods rather than to set standards for crime laboratories.

The FBI's position, as stated in the OTA report (1990), is that it will facilitate the establishment of standards through the consensus building process of TWGDAM. In addition, as the OTA report concludes, "some respondents . . . may not have understood this distinction and may have taken the survey question to mean [support for] FBI-mandated standards, hence the lower affirmative response and perhaps the small negative response." Since there is nearly unanimous agreement that the FBI should have a leadership role in DNA analysis technology (see Table 10), the issue seems to be determining how the FBI can provide leadership for DNA-related issues without becoming intrusive or losing respect for the autonomy of state and local crime laboratories.

DNA Training: The FBI conducts a 4-week course at the FBI Laboratory's FSRTC in Quantico, Virginia which is a combination of classroom lecture and hands-on training in the FBI's approach to DNA analysis. The course is offered free of charge to qualified crime laboratory personnel. Survey respondents whose crime laboratories have sent students to the DNA course were asked about their perceptions of the quality of the training. Table 11 shows the percent of respondents that were very satisfied or somewhat satisfied with the FBI's DNA training.

Table 11. Perceived Quality of FBI's DNA Training

Aspect of Training	Percent of Respondents That Sent Students to DNA Training		Total
	Very Satisfied	Somewhat Satisfied	
Quality of training	80	19	99
Course materials	71	24	95
Explanation of underlying science and technology	71	17	88
Laboratory work experience	58	31	89
Analysis of DNA results	53	32	85
Usefulness of training	64	19	83

SOURCE: Federal Bureau of Investigation, 1990.

Desirability of Follow-up Course: Eighty percent of the respondents that have sent students to the FBI's DNA training believe the FBI should offer a follow-up course designed to prepare DNA examiners to testify in court as expert witnesses. The consensus was that such a course should be approximately 2 weeks long and include the following:

- 1) Refresher training on the conceptual and theoretical foundations of DNA analysis (94% of respondents favoring follow-up course).
- 2) Training on the analysis and interpretation of DNA test results, including the use of statistical data (98%).
- 3) Training on rendering expert court testimony (94%).

Increasing Adoption of DNA Analysis: All respondents were asked what they believe is needed to increase the adoption and use of DNA analysis by crime laboratories. Table 12 shows the percentage of yes answers to the various factors presented.

Table 12. What is Needed to Increase Adoption and Use of DNA Analysis by Crime Laboratories

Factor	Percent Answering Yes
FBI play a more prominent role	80
ASCLD play a more prominent role	74
Increase awareness of DNA technology	84
Easier and quicker DNA analysis procedure	99
Improved access to FBI's DNA analysis training	94
Implementation of nationwide DNA database	94

SOURCE: Federal Bureau of Investigation, 1990.

SUMMARY AND CONCLUSIONS

The law enforcement and forensic science communities are moving quickly to adopt and implement forensic DNA testing to help investigate and prosecute sex-related and other violent crimes. Four-fifths of all crime laboratories have experience with DNA testing, either by performing the analysis themselves or sending DNA evidence to an outside laboratory. Although there are significant expenditures of time and money required for a crime laboratory to develop its own capability to perform DNA analysis, over half of all state and local crime laboratories expect to be performing DNA testing before 1995.

The FBI Laboratory is perceived to have a prominent role in fostering the use of DNA analysis in forensic casework. Three-fifths of all state and local crime laboratories have sent DNA cases to the FBI Laboratory for examination, and most laboratories working to establish their own in-house DNA testing capabilities have sent forensic scientists to the FSRTC for training. By working with TWGDAM and ASCLD, the FBI Laboratory is helping to establish guidelines for quality assurance of DNA test results that will allow DNA profiles to be exchanged through a national DNA database system.

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United States Congress. Office of Technology Assessment (1990). Genetic Witness: Forensic Uses of DNA Tests, Chapter 6 and Appendix B, OTA-BA-438. U. S. Government Printing Office, Washington, D. C.