



# Bureau of Justice Statistics Bulletin

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# Survey of DNA Crime Laboratories, 2001

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In calendar year 2000 publicly operated forensic crime laboratories that perform DNA analyses reported analyzing almost 25,000 cases which involved DNA evidence and over 148,000 DNA samples collected from persons convicted of a crime. These are increases over the approximately 14,000 cases and 45,000 convicted offender samples reported analyzed in 1997.

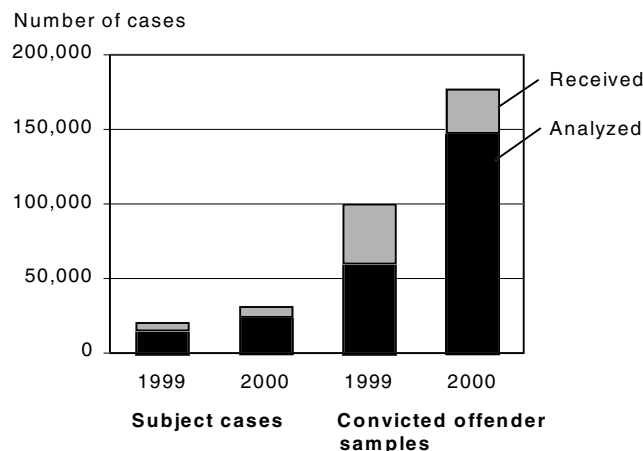
As of January 2001, 81% of DNA crime laboratories reported DNA analyses backlogs totaling 16,081 subject cases and 265,329 convicted offender samples. To complete DNA case and convicted offender sample analyses, 45% of the crime laboratories surveyed contracted private laboratories. Those private laboratories had a reported backlog of 918 subject cases and 100,706 convicted offender samples.

These findings come from the Bureau of Justice Statistics (BJS) 2001 National Study of DNA Laboratories, the second national survey of publicly operated forensic crime laboratories that perform DNA testing. Information from the initial survey was reported in 2000.<sup>1</sup> This follow-up to the initial survey obtained data from 110 of the approximately 120 known public forensic DNA laboratories.

<sup>1</sup>Survey of DNA Crime Laboratories, 1998, February 2000, NCJ 179104. <<http://www.ojp.usdoj.gov/bjs/abstract/sdnacl98.htm>>

## Highlights

### Number of cases received and analyzed by publicly operated DNA crime laboratories



- In 2000 DNA crime laboratories received about 31,000 subject cases, an increase from almost 21,000 cases in 1999. Cases with identified suspects accounted for almost three-quarters of the total in both 1999 and 2000.

- The DNA crime laboratories analyzed almost 16,000 subject cases in 1999 and 25,000 cases in 2000. About 80% of the cases analyzed in both 1999 and 2000 were known subject cases.

- At the beginning of 2001, 81% of DNA crime laboratories had backlogs totaling 16,081 subject cases and 265,329 convicted offender samples.

- The number of full-time staff in DNA laboratories ranged from 1 to 60 with

a median staff of 6. A majority of full-time employees (88%) were on the technical staff.

- All DNA laboratories received DNA case samples from local police and sheriffs' offices. About half received samples from State police (56%) and medical examiners (48%).

- Forty-five percent of laboratories reported contracting a private laboratory to do forensic DNA testing in 2000. They contracted 944 subject cases and 204,359 convicted offender samples.

- A third of the DNA laboratories that contracted with private facilities, reported private lab backlogs at the start of 2001 totaling 918 subject cases and 100,706 convicted offender samples.

As part of their DNA Laboratory Improvement Program, the National Institute of Justice (NIJ) funded the initial 1998 survey to help identify workload and technology issues.<sup>2</sup>

Between 1997 and 2000 the workload for the Nation's DNA crime laboratories increased substantially. During this period DNA labs recorded a more than 50% increase in subject cases and convicted offender samples received (table 1). In that same time the total number of full-time employees working at DNA crime laboratories increased by a third, the number of subject cases analyzed increased by 73%, and the number of convicted offender samples analyzed more than tripled.

The increases in work received and analyzed between 1997 and 2000 resulted in casework backlogs reported by DNA crime laboratories increasing by 135% while reported convicted offender backlogs decreased by 7%.

### Forensic Laboratory Survey

While the technology available for analyzing deoxyribonucleic acid (DNA)

<sup>2</sup>For more information on NIJ programs related to forensic science see their website at <[www.ojp.usdoj.gov/nij/sciencetech/invest.htm](http://www.ojp.usdoj.gov/nij/sciencetech/invest.htm)>

for criminal justice purposes has been progressing rapidly, the U.S. Department of Justice has undertaken several initiatives to assist forensic laboratories in improving their DNA analysis capabilities. This survey was conducted to collect current information about publicly funded forensic crime laboratories performing DNA testing across the Nation. That information can be compared to the baseline information collected in 1999.

The survey was sent to 135 forensic laboratories, and 124 responses were received from individual public laboratories and headquarters for statewide forensic crime laboratory systems. The responses included 110 publicly funded forensic laboratories that perform DNA testing in 47 States. (See a description of the agencies on page 7.)

About half of the forensic laboratories (49%) were part of a Statewide laboratory system. For most of these forensic crime laboratories, DNA analysis was just one of several forensic analyses the labs performed. About 90% of DNA crime laboratories were also responsible for controlled-substance analysis and firearms/toolmark/footwear/tireprint analysis

(table 2). Sixty-five percent of DNA crime laboratories also performed crime scene investigation, blood alcohol testing, fire debris analyses, and trace analyses.

An aspect of the laboratories' ability to perform accurate, consistent analyses and to have those analyses used and defended in court is the adherence to accepted procedures and guidelines. One indication that a laboratory successfully follows the forensic community's standards is accreditation by a recognized forensic organization.

**Table 1. Status of workloads in DNA crime laboratories, by type of case, 1997-2000**

| Case status and type of work | 1997    | 2000    | Percent change |
|------------------------------|---------|---------|----------------|
| Work received                |         |         |                |
| Casework*                    | 20,793  | 31,394  | 51%            |
| Convicted offender           | 115,681 | 177,184 | 53             |
| Work analyzed                |         |         |                |
| Casework*                    | 14,289  | 24,790  | 73             |
| Convicted offender           | 44,810  | 148,347 | 231            |
| Backlog of work              |         |         |                |
| Casework*                    | 6,800   | 15,981  | 135            |
| Convicted offender           | 286,819 | 265,329 | -7             |
| Full-time employees          | 672     | 893     | 33             |

Note: Workloads and backlogs do not include all DNA crime laboratories because of non-responses of some laboratories.

\*Casework includes known and unknown subject cases.

**Table 2. Analytical responsibilities of crime laboratories which perform DNA analysis, 2001**

| Areas of analysis                        | Crime laboratories |         |
|--|--------------------|---------|
|  | Number             | Percent |
| Total                                    | 110                | 100%    |
| Firearms/toolmark/<br>footwear/tireprint | 98                 | 89%     |
| Trace analysis                           | 88                 | 80      |
| Latent prints                            | 71                 | 65      |
| Fire debris                              | 84                 | 76      |
| Explosive residue                        | 54                 | 49      |
| Controlled substance                     | 101                | 92      |
| Conventional serology                    | 63                 | 57      |
| Toxicology                               | 52                 | 47      |
| Blood alcohol                            | 71                 | 65      |
| Questioned documents                     | 51                 | 46      |
| Computer crime<br>investigation          | 16                 | 15      |
| Crime scene                              | 75                 | 68      |
| Other                                    | 21                 | 19      |

Note: Details do not add to total because of multiple responses.

**Table 3. Status of DNA crime laboratory accreditation, 2001**

|                                 | Labs performing<br>DNA analyses |         |
|---------------------------------|---------------------------------|---------|
|                                 | Number                          | Percent |
| Total                           | 110                             | 100%    |
| Laboratory accredited           | 69                              | 63%     |
| Applied for accreditation       | 15                              | 14      |
| Pre-accreditation<br>inspection | 6                               | 5       |
| None                            | 20                              | 18      |

Note: Though some multiple responses were received only the most advanced level of accreditation process is reported for each laboratory.

As of January 1, 2001, 63% of laboratories were accredited by an official organization, and 19% had applied for accreditation or had a pre-accreditation inspection by an accredited laboratory (table 3). Most of the accredited laboratories (87%) had been accredited by the American Society of Crime Lab Directors-Laboratory Accreditation Board (ASCLD-LAB) (table 4).

Standards for performing DNA testing involve the selection of markers, the number of tests required, and what procedures should be followed. Such standards have been developed by a working group of forensic experts which includes representatives from the State and Federal crime laboratories, academia, and the FBI.<sup>3</sup>

<sup>3</sup>Group developing standards for DNA testing was called the Technical Working Group on DNA Analysis and Methodology (TWGDAM) which is now known as the Scientific Working Group on DNA Analysis and Methodology (SWGAM).

Congress required the FBI to establish the DNA Advisory Board (DAB) to develop benchmarks for laboratories doing forensic DNA analysis. The final DAB report was completed in February 1997 and forwarded to the Director of the FBI. The FBI has since used the DAB recommendations to issue Quality Assurance Guidelines that are statutorily required. Adherence to those standards is a benchmark for court acceptance of the results of DNA analysis as evidence.

Every laboratory doing DNA analysis reported following some standard procedural guidelines. All the laboratories followed either the Quality Assurance Guidelines of the FBI or the SWGDAM standards or both. FBI guidelines and SWGDAM standards do not cover all the same areas of laboratory operations and procedures; however, they are similar because the FBI incorporated many of the SWGDAM standards into its guidelines. A small percentage of laboratories (9%) also followed their own in-house standards (table 5).

**Table 4. DNA crime laboratory accrediting organizations, 2001**

|           | Accredited laboratories |         |
|-----------|-------------------------|---------|
|           | Number                  | Percent |
| Total     | 69                      | 100%    |
| ASCLD-LAB | 60                      | 87%     |
| NFSTC     | 8                       | 12      |
| Other     | 8                       | 12      |

Note: Details do not add to total due to multiple responses.  
 ASCLD-LAB — American Society of Crime Lab Directors — Laboratory Accreditation Board  
 NFSTC — National Forensic Science Technology Center

**Table 5. Standard guidelines DNA crime laboratories follow, 2001**

| Guidelines                              | States and laboratories |         |
|---|-------------------------|---------|
|   | Number                  | Percent |
| Total                                   | 110                     | 100%    |
| Quality Assurance Guidelines of the FBI | 93                      | 85%     |
| SWGAM                                   | 62                      | 56      |
| In-house standards                      | 10                      | 9       |
| Other                                   | 1                       | 1       |

Note: Percentages do not add to 100% because of multiple responses.  
 SWGDAM — Scientific Working Group on DNA Analysis and Methodology

**Crime laboratory budgets**

Crime laboratory budgets are sometimes administered by the agency or department responsible for the operation of the laboratory. In many cases that is a State or local law enforcement department. Consequently, some laboratories have only partial budget or no budget information available. Most forensic DNA laboratories are part of a larger crime laboratory

responsible for many different types of evidence analyses. In this study, 62% of DNA laboratories provided information on the entire forensic laboratory's annual budget for 1999, and 68% for the 2000 budget.

Of the laboratories that reported budget amounts for DNA work, the annual DNA budget ranged from \$15,000 to \$1.8 million in fiscal year 1999 and from \$5,000 to \$1.95 million in fiscal year 2000.

The laboratories that did report had a wide range of budgets. In 1999 the reported budgets for entire forensic laboratories ranged from \$60,000 to \$13 million, in fiscal year 2000 they ranged from \$45,000 to \$15.5 million.

Laboratory budgets may change drastically from year to year during a period of changing technologies and shifting demands. For example, if new equipment purchases and/or capital improvements are included in a single year of a laboratory's budget, that year will not be representative of the ongoing cost of running the laboratory. This study did not attempt to identify how much of each laboratory budget could be classified as one-time expenditures versus recurring expenses.

**Annual laboratory budgets**

|                           | Number of budgets reported | Annual laboratory budgets (in thousands) |         |          |
|---------------------------|----------------------------|--|---------|----------|
|                           |                            | Mean                                     | Minimum | Maximum  |
| Total forensic laboratory |                            |  |         |          |
| 1999                      | 71                         | \$2,952                                  | \$60    | \$13,000 |
| 2000                      | 77                         | 3,091                                    | 45      | 15,500   |
| DNA laboratory            |                            |  |         |          |
| 1999                      | 44                         | \$410                                    | \$15    | \$1,800  |
| 2000                      | 49                         | 464                                      | 5       | 1,950    |

Depending on the organization of the laboratories, the costs of DNA analyses may not be identifiable. About half (52%) of the laboratories performing DNA analyses reported that they could identify budget amounts used for DNA testing.

## Staffing

The median number of full-time staff members working in DNA laboratories as of January 2001 was 6. The DNA laboratories full-time staffs ranged from 1 employee to a staff of 60 employees. The 110 laboratories employed a total of 893 full-time DNA employees. A majority of those full-time employees were on the technical staff (88%) with most of them having the primary duty of a DNA examiner/analyst (table 6).

In many instances a single staff member has responsibility for more than one position. This survey counted each employee only once, using his/her primary duty. Therefore, even though a laboratory may have had someone responsible for managing laboratory administration or managing the laboratory's Combined DNA Indexing System (CODIS), they may not have classified any person as primarily an administrative manager or a CODIS manager.

## Workload

Laboratories received DNA samples for analysis from several different sources. All DNA laboratories reported receiving DNA samples from local police and sheriffs' offices. About half of the laboratories received samples from State police (58%) and medical examiners (50%). Nineteen percent of laboratories reported "other agencies," including Federal agencies, submitting DNA for analysis (table 7).

A single criminal incident can involve one or more victims, one or more suspects, multiple pieces of evidence, and multiple biological samples for testing. Therefore, a single incident can have a few, to potentially hundreds of possible samples for testing, and laboratories use different counting methods to measure workload.

Almost all laboratories (95%) reported counting workload by case, defined as a single criminal incident or event,

which may have multiple pieces of evidence and multiple samples. Nine percent of laboratories counted workload by sample and 8% count by pieces of evidence.

| Unit by which laboratories count casework | Laboratories performing DNA analyses, 2001 |         |
|---|--|---------|
|   | Number                                     | Percent |
| Total                                     | 106  | 100%    |
| Case                                      | 101  | 95%     |
| Evidence                                  | 9  | 8       |
| Sample                                    | 10   | 9       |
| Other                                     | 5  | 5       |

Note: Cells do not add to total because of multiple responses. Data are missing for 4 laboratories.

In 2000 DNA laboratories received about 31,000 known and unknown subject cases, an increase from almost 25,000 cases in 1999 (table 8). Known subject cases accounted for about three-quarters of the total casework in 1999 and 2000 just as they did in the previous survey of years 1996 and 1997. The DNA laboratories analyzed almost 16,000 cases in 1999 and 25,000 cases in 2000. About 80% of the cases analyzed in both 1999 and 2000 were known subject cases.

The median number of known and unknown subject cases received by all laboratories in 2000 was 244; the median number of cases analyzed was 176. During the previous year, half of the laboratories received 186 or more known and unknown subject cases and analyzed 110 or more cases.

DNA laboratories also received 177,000 convicted offender samples in 2000 and analyzed about 148,000. That was an increase from 100,000 convicted offender samples received and 61,000 samples analyzed in 1999.

**Table 6. Crime laboratories with full-time DNA staff, 2001**

|                  | Number of labs reporting staff size* | Full-time DNA staff members |        |         |
|------------------|--------------------------------------|-----------------------------|--------|---------|
|                  |                                      | Total                       | Median | Maximum |
| Total            | 110                                  | 893                         | 6      | 60      |
| Administration   |                                      |                             |        |         |
| Admin. Manager   | 110                                  | 55                          | --     | 5       |
| CODIS manager    | 110                                  | 27                          | --     | 1       |
| Support staff    | 110                                  | 29                          | --     | 4       |
| Technical staff  |                                      |                             |        |         |
| Manager/leader   | 110                                  | 78                          | 1      | 2       |
| Examiner/analyst | 110                                  | 590                         | 4      | 43      |
| Technician       | 110                                  | 72                          | 0      | 8       |
| Lab support      | 110                                  | 42                          | --     | 7       |

\*Table includes laboratories with DNA staff doing screenings and test validations, but not yet performing DNA analyses. Not all DNA labs reported staff size.  
-- More than half the laboratories reported none.

**Table 7. Type of agencies submitting DNA samples to laboratories for analyses, 2001**

| Submitting agency            | Laboratories receiving DNA cases/samples |         |
|------------------------------|--|---------|
|                              | Number                                   | Percent |
| State police                 | 62                                       | 58%     |
| Local police/Sheriff         | 107                                      | 100     |
| State Corrections department | 47                                       | 44      |
| Medical examiner             | 53                                       | 50      |
| Other agencies               | 20                                       | 19      |

Note: Percentages do not add to 100 because of multiple responses. Missing responses from 3 laboratories.

**Table 8. Status of case workloads in DNA crime laboratories, by type of case, 1999-2000**

| Year and type of case | Labs reporting | Cases received |        | Cases analyzed |        | Backlog of cases |        |
|-----------------------|----------------|----------------|--------|----------------|--------|------------------|--------|
|                       |                | Total*         | Median | Total*         | Median | Total*           | Median |
| 1999                  |                |                |        |                |        |                  |        |
| Casework*             | 81             | 20,707         | 186    | 15,884         | 110    | --               | --     |
| Known subject cases   | 77             | 13,809         | 130    | 10,987         | 78     | --               | --     |
| Unknown subject cases | 77             | 4,155          | 23     | 2,408          | 10     | --               | --     |
| Convicted offender    | 92             | 100,242        | 0      | 61,036         | 0      | --               | --     |
| 2000                  |                |                |        |                |        |                  |        |
| Casework*             | 88             | 31,394         | 244    | 24,790         | 176    | 15,981           | 65     |
| Known subject cases   | 83             | 18,125         | 187    | 14,999         | 120    | 5,068            | 28     |
| Unknown subject cases | 83             | 7,244          | 46     | 4,070          | 23     | 5,606            | 10     |
| Convicted offender    | 91             | 177,184        | 0      | 148,347        | 0      | 265,329          | 0      |

\*Casework totals include laboratories that could not separate known and unknown subject cases.  
--Backlogs not reported for 1999.

Forty-five percent of all laboratories reported contracting a private laboratory to do DNA testing in 2000 (not shown in a table). The laboratories reported a total of 798 known and unknown subject DNA cases and 32,510 convicted offender samples contracted to private laboratories in 1999. In 2000 they contracted 944 subject cases and 204,359 convicted offender samples.

The number of cases and convicted offender samples received and analyzed varied by the size of the laboratory. In 2000 the median number of known and unknown subject cases received by laboratories with fewer than 10 full-time staff

members was 196. These smaller laboratories analyzed a median of 101 cases in 2000. Less than half of small laboratories reported receiving or analyzing any convicted offender samples. In general only State operated laboratories process convicted offender samples.

DNA laboratories with 10 or more full-time staff received a median of 480 known and unknown subject cases and half those laboratories analyzed 377 or more cases in 2000. Half of these larger laboratories also reported receiving 2019 or more convicted offender samples and analyzing 868 or more samples

## Case backlog

Eighty-one percent of DNA laboratories reported having a backlog of known or unknown subject cases, or a backlog of convicted offender samples, as of January 1, 2001. The survey defined a case as backlogged if it had complete sets of samples ready for analysis in the laboratory for more than 15 days, and convicted offender samples as backlogged if the sample was in the laboratory more than 10 days.

The laboratories and State headquarters reported backlogs totaling 16,081 known and unknown subject cases and 265,000 convicted offender samples. To help alleviate the backlog of convicted offender samples, as of September 30, 2000, the National Institute of Justice (NIJ) began awarding grants through the DNA Backlog Reduction Program 2001 to fund in-house and contracted private laboratory analyses of backlogged samples.

### Types of DNA work received by forensic crime laboratories

Forensic crime laboratories receive biological samples for DNA analysis from a variety of sources for different types of analyses. For purposes of this study, the DNA analyses that crime laboratories perform are categorized into two general types: casework and convicted offender samples.

#### Casework

Casework refers to cases received by forensic crime laboratories which involve a criminal incident under investigation. Each case may involve multiple pieces of evidence retrieved from a crime scene, and each piece of evidence may have multiple samples for testing. Casework may involve many different types of biological samples (such as blood, semen, saliva, and hair) which must be identified, selected for analysis, and sampled from crime scene evidence. Casework is generally more difficult and time consuming than analysis of convicted offender samples.

Because each case may also have a subject or subjects identified as suspects, casework can be further divided into "suspect cases" and

"nonsuspect cases." This distinction can change. For example, if testing eliminates all suspects, the case can be recategorized as a "nonsuspect case." For the purposes of this study, suspect and nonsuspect cases refer to whether there were any suspects at the time the case was originally received.

#### Convicted offender samples

Convicted offender samples are DNA samples collected from persons convicted of a crime, normally a violent crime or felony. The samples are to be analyzed, and the results are to be included in a DNA database.

Convicted offender samples are usually blood or saliva.

The DNA Identification Act of 1994 (42 U.S.C. 14132) authorizes the FBI to establish DNA indexes for —

- persons convicted of crimes
- samples recovered from crime scenes, and
- samples recovered from unidentified human remains.

As of June 1998, legislation in all 50 States and the District of Columbia requires convicted offenders to provide samples for DNA databases.

### State court prosecutors' offices use of DNA evidence

In the 2001 National Survey of Prosecutors, all the prosecutors' offices serving large districts reported using DNA evidence. The survey collected data from more than 100 chief prosecutors that handled felony cases in State courts of general jurisdiction and served districts with a population over 500,000.

Nearly 90% of these large offices reported having used DNA evidence during plea negotiations and all offices reported having used DNA evidence during felony trials. Three-quarters of the offices received DNA analyses from State-operated forensic laboratories.

The most common problem with the use of DNA evidence by prosecutors' offices was excessive delay in getting laboratory results, reported by 70% of offices. The next most common complaint, reported by 43% of offices, was inconclusive results.

Source: *State Court Prosecutors in Large Districts, 2001*, December 2001, NCJ 191206.

## Data processing

Almost three-quarters of the laboratories (72%) waited until an analytical report was complete before reporting DNA test results, while nearly a quarter of labs reported results as soon as all laboratory testing was completed. A small number of labs specified that a technical report must also have been done before results were released (not shown in a table).

When the laboratories reported subject case results, over half said they regularly reported to the agency or office that submitted the case (59%) and regularly reported to the prosecutor's office (57%). Nearly as many (45%) also reported test results to an investigating office. After being analyzed, convicted offender samples were most frequently reported to a

CODIS office. Seven laboratories also reported convicted offender sample analyses to other offices and agencies such as a sexual offender registry. Over three-quarters of laboratories reported that they maintain a local DNA database of some type, such as the Local DNA Indexing System (LDIS), the community level part of the CODIS program. Access to the local DNA databases is limited to personnel only at each of those laboratories.

## Processing policies and procedures

To help control the flow of cases through DNA labs, a majority of laboratories had policies for the acceptance and processing of casework. Nearly all the laboratories, 97%, reported a policy for acceptance of DNA case submissions. While 79% of the laboratories said they accept any criminal cases, 14% of the laboratories had some

restrictions on the known subject cases or unknown subject cases they accept.

To further control DNA case processing, 91% of laboratories reported having a system for prioritizing how cases are assigned for analysis. Seventy percent of laboratories assigned cases for analysis according to cases' court dates. Over half of laboratories started cases based on prosecutor requests, and 41% started analysis of cases in the order cases were received by the laboratory.

Eighty-three percent of DNA laboratories also had a program for looking at inactive, closed, or previously analyzed cases. Eighty-two percent of the laboratories that analyzed these types of old cases did so when requested by the agency that submitted the case's evidence. Nearly half of the laboratories reanalyzing cases had a program that analyzed cases when DNA testing was not previously done, and over 40% reanalyzed cases when DNA was tested with an earlier method.

For casework evidence, over half (53%) of the DNA laboratories had a policy to minimize the number of samples taken per case, such as taking only the most probative samples and encouraging discussions between laboratory personnel and investigator offices.

## Storage of DNA

Most laboratories, (85%), reported storing samples of DNA in case there was a need to reanalyze the DNA evidence in the future. Seventy-eight percent of laboratories had a written policy regarding sample disposition. Many of these policies specified what form of DNA was stored, for how long, and what evidence was returned or destroyed.

Eighty-one percent of the laboratories that stored DNA stored it frozen, and 18% stored it ultra-frozen. The laboratories' capacity to store DNA ranged from 500 to 710,000 samples.

## Equipment/supplies

As the techniques for performing DNA analysis have advanced, the

### Comparisons with *Survey of DNA Crime Laboratories, 1998*

This report is a follow-up to the report *Survey of DNA Crime Laboratories, 1998* published in February 2000. Data in the earlier report were collected primarily for 1997 and 1998. So that comparisons could be made, data were collected in this study primarily for 1999 and 2000.

Of 120 laboratories responding to the 1998 survey, 108 reported performing DNA analysis. Of the 124 laboratories responding in 2001, 110 reported performing DNA analysis.

In 1998, 56% of DNA laboratories were accredited by an official organization, and 99% of DNA laboratories used DNA Advisory Board (DAB) or Technical Working Group on DNA Analysis and Methodology (TWGDAM) standard guidelines to perform DNA analyses. In 2001, 63% of DNA laboratories were accredited, and 100% of DNA laboratories used Quality Assurance Guidelines of the FBI or Scientific Working Group on DNA Analysis and Methodology (SWGDM) standard guidelines.

Laboratories continue to receive cases primarily from law enforcement

sources. In 1998 and 2001, 98% and 96% of laboratories received cases from local police and sheriff's departments.

In 1997 DNA laboratories received nearly 21,000 subject cases and 116,000 convicted offender samples. By 2000 the labs were receiving 31,000 subject cases and 265,000 convicted offender samples. The number of cases analyzed also increased from 14,000 subject cases in 1997 to nearly 25,000 in 2000, and from 45,000 to 148,000 convicted offender samples analyzed.

At yearend 1998, 69% of labs reported having a backlog totaling 6,800 subject cases and 287,000 convicted offender samples. As of January 1, 2001, 81% of labs reported having a backlog totaling 16,000 subject cases and 265,000 convicted offender samples.

The number of full-time staff members increased from a total of 672 (with the largest staff including 47) in 1998 to a total of 897, with the largest staff including 60 in 2000.

equipment used by laboratories has needed to be updated. The types of DNA analysis that can be done and the number of DNA samples that can be analyzed are directly dependent on the equipment the laboratory has available. For example, a genetic analyzer commonly found in DNA laboratories in 2001 has an advertised standard-mode throughput of 5,220 basecalls per day, while a newer model made by the same company has a standard-mode throughput of 90,720 basecalls per day.

Laboratories reported owning a total of 391 thermocyclers, mainly the various Perkin-Elmer models. There was a median of 3 thermocyclers per DNA lab.

The DNA labs reported owning a total of 284 analyzers. The most commonly owned analyzer was the ABI310, making up three-quarters of all the analyzers. The next most common analyzers were the ABI377 (12%) and the Hitachi/FMBIO (10%). Each DNA lab owned from 0 to 20 analyzers, with a median of 2 analyzers per laboratory.

While 19% of responding laboratories reported that they planned to use robotics or some type of automated processing in their DNA analyses in

the next 2 years, only 8 laboratories reported currently using automation. Four of those laboratories reported using automation in spotting/aliquoting, in the extraction of DNA, and in the separation and analysis. Three laboratories reported using automation for PCR reaction set up.

The forensic community has been moving away from Restricted Fragment Length Polymorphism (RFLP) testing as the newer technology of Polymerase Chain Reaction (PCR) has been implemented in laboratories. The results of this survey demonstrate that change when compared to the previous DNA crime laboratory study. In 1998, 43 DNA laboratories reported using RFLP for casework and 14 for convicted offender samples. In 2001 one laboratory reported using RFLP for casework, and none used it for convicted offender samples.

The test kits most commonly used by laboratories for DNA typing of casework evidence at the start of 2001 were CoFiler, by 82 laboratories, and Profiler Plus, by 79 laboratories. The Polymarker and DQ Alpha kits were also used for casework analyses by 23 and 22 laboratories respectively. The Profiler Plus and CoFiler were also the

most often used kits for DNA typing of convicted offender samples by the laboratories with 20 using Profiler Plus and 21 using CoFiler.

Work contracted to private laboratories used similar test kits for DNA typing. Contract laboratories used the Profiler Plus and CoFiler most often for both casework and convicted offender samples. When contracting with private laboratories, a laboratory can identify the information required in a completed analysis without having to specify which test kit(s) need to be used in the DNA typing. Four laboratories reported not knowing what test kits were used by contracted private laboratories.

### Study population and number of respondents

To begin this study BJS created a list of publicly funded crime laboratories that we believed had performed DNA analyses. The list of laboratories was drawn from several sources, primarily respondents from the initial survey of DNA crime laboratories, laboratories that applied for grants from NIJ, and laboratories participating in CODIS.

### Federal Bureau of Investigation (FBI) — Combined DNA Index System (CODIS)

CODIS enables State and local law enforcement crime laboratories to exchange and compare DNA information electronically, thereby linking serial violent crimes to each other and to known violent offenders.

All 50 States and the District of Columbia have passed legislation requiring offenders convicted of certain crimes, determined by each State, to provide DNA samples for databasing. Analysis of those DNA samples reveals a set of genetic characteristics, a DNA profile, unique to each individual. Those DNA profiles are then entered into the convicted offender index of CODIS. DNA profiles developed from crime scene evidence, such as semen

stains or blood spatters are entered into the forensic index of CODIS.

CODIS uses the two indexes to generate investigative leads in crimes where biological evidence is recovered from the crime scene. CODIS software searches the two indexes for matching DNA profiles.

The FBI has provided CODIS software, together with installation, training, and user support, free of charge to any State or local law enforcement laboratories performing DNA analysis.

For more information about the FBI and the CODIS program see their website at <[www.fbi.gov](http://www.fbi.gov)>.

The Bureau of Justice Statistics is the statistical agency of the U.S. Department of Justice. Lawrence A. Greenfeld is acting director.

Greg W. Steadman wrote this report under the supervision of Steven K. Smith. Lisa Forman, Ph.D., and Anjali Swienton, of the National Institute of Justice provided assistance on technical issues and project development. Marika Litras provided statistical assistance and review. Tom Hester and Tina Dorsey edited the report. Jayne Robinson prepared the report for publication.

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This report, survey questionnaire, and other materials from the Bureau of Justice Statistics are available through the Internet — <http://www.ojp.usdoj.gov/bjs/>

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Verification of laboratories contacts and addresses was done by telephone for a small number of these laboratories before the first mailing of the survey.

In February 2001, surveys were mailed to 135 forensic crime laboratories and state laboratory system headquarters. An electronic version of the survey, on a BJS website, was also made available to the laboratories so they could provide information using the Internet.

Laboratories were given until mid-March to return the surveys. Follow-up to the initial mailing continued for four months with a second mailing, phone calls, and faxes to laboratories that had not responded.

When data collection was stopped we had received 124 responses. Of those respondents, 110 reported that they currently performed DNA analyses. The respondents that did not test DNA included State headquarters, laboratories in the process of setting up DNA

analysis capability, and one lab that screened for presence of DNA but did not perform analyses.

We do not have information from the 13 laboratories that did not respond, but we are confident that a majority of those nonrespondents perform some level of DNA analysis. Including those with the 110 DNA laboratories that did respond, we estimate that approximately 120 forensic crime laboratories in the United States currently perform DNA analyses.

**U.S. Department of Justice**  
Office of Justice Programs  
Bureau of Justice Statistics  
*Washington, DC 20531*

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