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Census of Publicly Funded Forensic Crime Laboratories, 2002

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Federal, State, and local forensic crime laboratories employed over 9,300 full-time equivalent (FTE) personnel in 2002 and had total budgets exceeding \$750 million. These publicly funded labs received nearly 2.7 million new cases, including a much larger number of separate requests for forensic services during calendar year 2002.¹

These labs ended the year with over 500,000 backlogged requests for forensic services — a more than 70% increase in the backlog of requests compared to the beginning of the year.² The backlog increased in most categories of forensic services.

The Nation's publicly funded crime labs estimated that about 1,900 additional FTEs would have been needed to achieve a 30-day turnaround for all 2002 requests for forensic services. Based on starting salaries for analysts or examiners in these labs, the estimated cost of the additional FTEs exceeds \$70.2 million.

Over three-quarters of the labs indicated that resources beyond

¹A "case" is defined as evidence submitted from a single criminal investigation. A case may include multiple "requests" for forensic services. For example, one case may include a request for biology screening and a request for latent prints.

²A case or request is defined as backlogged if it is in the laboratory and remains unreported for a period of 30 days or more.

Highlights

- A total of 351 publicly funded forensic crime laboratories operated in the United States as of yearend 2002. This total includes 203 State or regional labs, 65 county, 50 municipal, and 33 Federal labs.
- A typical laboratory in 2002 had 2 managers, 2 secretaries or clerks, 12 analysts, and 2 technicians. The median laboratory operating budget in 2002 was \$1.3 million.
- A typical laboratory in 2002 started the year with a backlog of about 390 requests, received 4,900 requests, and completed 4,600 requests.
- About half of all requests in 2002 were in the area of controlled substances.
- Nearly all laboratories employed standard protocols for DNA testing (98%), controlled substances (98%), and latent prints (97%).
- Examiners in the Nation's crime laboratories processed requests at or above 90% of the expected examiner averages in 8 of 10 categories of forensic services.
- Forty-one percent of publicly funded labs in 2002 reported outsourcing one or more types of forensic services to private labs. Overall, labs outsourced nearly 240,000 requests for forensic services.
- Ninety-one percent of outsourced requests were DNA-related, including nearly 13,000 casework requests and 205,000 convicted offender samples in the Combined DNA Index System (CODIS). The median cost of outsourcing one CODIS sample was \$30.
- Sixty-one percent of the labs are accredited by the American Society of Crime Laboratory Directors Lab Accreditation Board (ASCLD-LAB). An additional 10% are accredited by some other organization.
- Fifty-five percent of non-Federal labs received some funding from grants in 2002.
- About half (52%) of publicly funded labs in 2002 had resources dedicated to training. Twelve percent had resources dedicated to research.

personnel increases would also have been needed to achieve a 30-day turnaround on all 2002 requests. These resource needs included capital expenditures for new and renovated laboratory space and facilities; additional and updated equipment; instrumentation, robotics, and

computers; basic and advanced training opportunities; and improved Laboratory Information Management Systems (LIMS). The total estimated cost of these needs exceeds \$500 million.

Background

Several surveys of crime laboratories have been conducted over the past 35 years, beginning with the 1967 John Jay College survey of crime laboratories.³ Surveys conducted in the 1970's and 1980's⁴ and in the 1990's⁵ have enumerated laboratory facilities in the United States, examined the role and impact of scientific evidence in the investigation and prosecution of criminal cases, and documented workloads and other administrative data among various samples of laboratories.

In recent years BJS has surveyed DNA crime laboratories (*Survey of DNA Crime Laboratories, 2001*, <<http://www.ojp.usdoj.gov/bjs/abstract/sdnacl01.htm>>). The National Institute of Justice has commissioned studies of DNA backlog and other topics in the forensic sciences, both in the United States and abroad (<<http://www.ojp.usdoj.gov/nij>> and <www.dna.gov>).

To obtain current baseline information about the workload and operations of the Nation's forensic crime laboratories, BJS in 2003-04 conducted its first Census of Publicly Funded Forensic Crime Laboratories. This report details the organization, functions, budget, staffing, workload, and performance expectations of the Nation's publicly funded Federal, State, and local forensic crime laboratories currently operating. BJS previously reported data for the 50 largest publicly funded State and local labs (*50 Largest Crime Labs, 2002*, <<http://www.ojp.usdoj.gov/bjs/abstract/50lcl.htm>>).

³A. Joseph, *Crime Laboratories – Three Study Reports*, OLEA Projects 013, 140, and 66-3, Washington, DC: U.S. Department of Justice, 1968.

⁴R. Fox and C. Cunningham, *Crime Scene Search and Physical Evidence Handbook*, Washington, DC: Law Enforcement Assistance Administration, 1973, and J. Peterson, S. Mihajlovic, and J. Bedrosian, "The Capabilities, Uses, and Effects of the Nation's Criminalistics Laboratories," *Journal of Forensic Sciences*, 30:1, 1985, pp. 10-23.

⁵American Society of Crime Laboratory Directors (ASCLD), *Survey of crime laboratory needs* (unpublished), 1998.

Table 1. Publicly funded forensic crime laboratories and employees in the United States, by size of laboratory, 2002

Number of FTE employees	Total laboratories		Total FTE employees	
	Number	Percent	Number	Percent
All laboratories	305	100%	9,397	100%
100 or more	15	5%	2,268	24%
50 to 99	46	15	3,061	33
25 to 49	60	20	2,096	22
10 to 24	92	30	1,455	15
Fewer than 10	92	30	518	6

Table 2. Publicly funded forensic crime laboratories and employees in the United States, by type of jurisdiction served, 2002

Type of jurisdiction	Total laboratories		Total FTE employees	
	Number	Percent	Number	Percent
All laboratories	305	100%	9,397	100%
State/regional	176	58%	4,797	51%
County	60	20	1,760	19
Municipal	45	15	1,746	19
Federal/national	24	8	1,095	12

As of yearend 2002, 351 publicly funded forensic crime laboratories operated in the United States. This total includes all labs that employed at least one full-time scientist whose principal function is examination of physical evidence for law enforcement agencies and to provide reports and testimony to courts of law with respect to that evidence. This report is based on data for 305 responding laboratories, unless specifically noted in tables and figures. Data for the Federal Bureau of Investigation (FBI) laboratory division, the Nation's largest publicly funded forensic crime laboratory, are summarized separately. (See page 11.)

Just over half (54%) of the laboratories are units of larger laboratory systems, and most (90%) of these laboratories serve State or regional jurisdictions. The census collected information from each lab within larger laboratory systems.

Personnel

Publicly funded crime laboratories in 2002 employed about 9,400 full-time equivalent (FTE) personnel (table 1). Most labs were relatively small. For example, 60% of labs employed fewer than 25 FTE personnel, and 80% employed fewer than 50 FTEs.

Just 5% of publicly funded labs had 100 or more FTEs in 2002, but these labs employed nearly a quarter (24%) of all FTE personnel.

Most of the labs (58%) served State or regional jurisdictions (table 2). Twenty percent served county-level jurisdictions, and 15% municipal jurisdictions. Eight percent served Federal or national jurisdictions.

State or regional laboratories employed 4,797 FTEs, or about half (51%) of all FTE personnel. County and municipal labs accounted for 1,760 (19%) and 1,746 (19%), respectively. Federal or national labs employed 1,095 FTEs, or about 12% of the total.

Overall, publicly funded crime labs in 2002 were authorized for a total of 9,798 FTEs and actually employed 9,397 FTEs, or 96% of the authorized total.

Type of jurisdiction	Authorized FTEs	Percent employed
All laboratories	9,798	96%
State/regional	5,031	95%
County	1,816	97
Municipal	1,779	98
Federal/national	1,173	93

Analysts or examiners - persons who typically prepare evidence, conduct tests, interpret results, sign laboratory reports, and testify in court - comprised 60% of all crime lab FTEs in 2002 (table 3). Technical support personnel, who typically assist analysts or examiners in preparing evidence and conducting tests, accounted for 12% of all FTEs. Twelve percent of FTEs were managerial personnel, 9% were in clerical positions, and 6% in miscellaneous categories.

Analysts or examiners comprise between 55% and 64% of all FTEs across laboratory size categories. Likewise, technical support personnel range from 9% to 15% of FTEs, managerial personnel range from 10% to 16% of FTEs, and clerical support personnel range from 8% to 13% of FTEs.

Similar ranges in the distribution of personnel are evident among labs by type of jurisdiction served (table 4).

A typical laboratory operation has about 18 FTE employees, including 2 managers, 2 secretaries/clerks, 12 analysts, and 2 technicians (table 5). Among the largest labs – those having 100 or more FTEs – a typical operation has 135 FTEs, including 17 managers, 14 secretaries/clerks, 76 analysts, and 16 technicians.

Among the smallest labs – those having fewer than 10 FTEs – a typical operation has 6 FTEs, including 1 manager, 1 secretary/clerk, and 3 analysts.

Laboratories serving Federal or national jurisdictions tend to be larger than labs serving other types of jurisdictions, typically employing about 45 FTEs, including 5 managers, 4 secretaries/clerks, 29 analysts, and 6 technicians (table 6).

Table 3. Employment by publicly funded forensic crime laboratories in the United States, by size of laboratory, 2002

Number of FTE employees	FTE employees in listed categories –				
	Analyst / examiner	Technical support	Managerial	Clerical support	Other
All laboratories	5,651	1,162	1,133	843	573
100 or more	1,251	264	308	215	233
50 to 99	1,828	463	307	256	179
25 to 49	1,333	211	267	175	108
10 to 24	933	179	169	128	38
Fewer than 10	306	46	82	69	15

Note: Personnel data for some labs are imputed. See *Methodology* section, page 15, for greater detail. Detail may not sum to total due to rounding of fractional FTEs.

Table 4. Employment by publicly funded forensic crime laboratories in the United States, by type of jurisdiction served, 2002

Type of jurisdiction	FTE employees in listed categories –				
	Analyst / examiner	Technical support	Managerial	Clerical support	Other
All laboratories	5,651	1,162	1,133	843	573
State/regional	2,959	580	556	462	225
County	1,046	232	229	167	84
Municipal	953	237	204	104	244
Federal/national	693	114	145	111	20

Note: Personnel data for some labs are imputed. See *Methodology* section, page 15, for greater detail. Detail may not sum to total due to rounding of fractional FTEs.

Table 5. Median number of FTEs in different employment categories, by size of laboratory, 2002

Number of FTE employees	Median FTE employees	Median number of FTE employees in listed categories –				
		Analyst/ examiner	Technical support	Managerial	Clerical support	Other
All laboratories	18	12	2	2	2	0
100 or more	135	76	16	17	14	14
50 to 99	61	37	8	6	5	1
25 to 49	35	21	3	4	3	1
10 to 24	16	10	1	2	1	0
Fewer than 10	6	3	0	1	1	0

Note: Median values are rounded to nearest whole value.

Table 6. Median number of FTEs in different employment categories, by type of jurisdiction served, 2002

Type of jurisdiction	Median FTE employees	Median number of FTE employees in listed categories –				
		Analyst/ examiner	Technical support	Managerial	Clerical support	Other
All laboratories	18	12	2	2	2	0
State/regional	16	10	1	1	2	0
County	17	11	2	2	2	0
Municipal	19	14	2	2	1	0
Federal/national	45	29	6	5	4	0

Note: Median values are rounded to nearest whole value.

Laboratory functions

About 90% of laboratories reported they examined controlled substances (figure 1). About two-thirds of laboratories examined firearms and toolmarks (63%), performed the screening of biological samples (usually in preparation for DNA analysis on selected exhibits) (65%), and examined latent prints (61%).

Examiners in 62% of laboratories engaged directly in crime scene investigations; however, most forensic examiners did not visit crime scenes. When asked who in their jurisdiction performs most major crime scene investigations, a quarter of the labs indicated that laboratory scientists doubled as crime scene investigators.

The majority (62%) of laboratories reported that agencies or persons separate from the lab handled most major investigations. These typically include a police unit having specialized evidence technicians or crime scene search officers who go to such scenes, take photographs, and locate, preserve, label and gather the physical evidence.

A much smaller percentage (14%) of laboratories reported that crime scene investigators operated from their laboratory and have primary responsibility for processing major crime scene investigations. Most of these are city or municipal laboratories.

Fifty-nine percent of laboratories examined one or more forms of trace evidence (such as hairs, fibers, glass, or paint) that may associate offenders and victims with one another and/or offenders with crime scenes.

Forensic crime laboratory functions, 2002

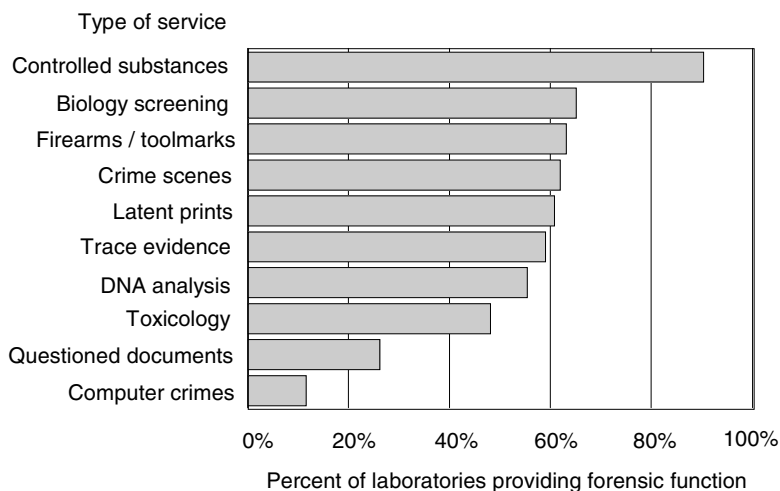


Figure 1

Less common functions were the examination of questioned documents (26% of laboratories), and computer crime investigations (11%).

Larger labs are generally able to handle a broader range of functions. Across all labs, the median number of forensic functions performed was 6, ranging from 3 functions among the smallest labs – those having fewer than 10 FTEs – to 8 functions among the largest labs – those having 50 or more FTEs.

Number of FTE employees	Median number of forensic functions
All laboratories	6
100 or more	8
50 to 99	8
25 to 49	7
10 to 24	6
Fewer than 10	3

A majority of larger labs were performing each of the listed functions. Among the smallest labs, a majority performed two of the listed functions: controlled substances (84%) and crime scene processing (57%).

Labs serving Federal or national jurisdictions were more specialized, typically performing three forensic functions, while labs serving other types of jurisdictions typically perform six or seven functions.

Type of jurisdiction	Median number of forensic functions
All laboratories	6
State/regional	6
County	7
Municipal	6
Federal/national	3

About three-quarters of labs serving Federal or national jurisdictions processed controlled substances (78%) and latent prints (74%) (table 8).

Table 7. Forensic crime laboratory functions, by size of laboratory, 2002

Number of FTE employees	Percent of laboratories performing listed forensic functions									
	Controlled substances	Biology screening	Firearms/ toolmarks	Crime scenes	Latent prints	Trace evidence	DNA analysis	Toxicology	Questioned documents	Computer crimes
All laboratories	90%	65%	63%	62%	61%	59%	55%	48%	26%	11%
100 or more	100%	93%	93%	57%	80%	100%	93%	67%	80%	14%
50 to 99	96	80	80	74	86	77	77	48	46	27
25 to 49	97	83	86	66	75	79	81	53	44	14
10 to 24	88	67	66	58	56	57	55	52	14	9
Fewer than 10	84	39	31	57	39	32	21	36	7	3

Note: Table does not include "other" category.

Table 8. Forensic crime laboratory functions, by type of jurisdiction served, 2002

Type of jurisdiction	Percent of laboratories performing listed forensic functions									
	Controlled substances	Biology screening	Firearms/toolmarks	Crime scenes	Latent prints	Trace evidence	DNA analysis	Toxicology	Questioned documents	Computer crimes
All laboratories	90%	65%	63%	62%	61%	59%	55%	48%	26%	11%
State/regional	91%	68%	64%	59%	55%	58%	57%	55%	21%	7%
County	93	75	67	63	58	73	70	51	31	14
Municipal	88	67	72	82	76	50	48	36	33	16
Federal/national	74	14	27	39	78	41	14	5	38	26

Note: Table does not include "other" category.

Workload

Management information systems

Laboratory Information Management Systems (LIMS) manage cases and/or evidence. These computer-based systems enable the laboratories to track the thousands of cases and items of evidence that they process. A single case may result in different forms of evidence undergoing analysis in various sections of a crime laboratory.

Three-quarters of laboratories had LIMS. Labs serving municipal jurisdictions were less likely to have LIMS (29%), compared to 88% of labs serving State or regional jurisdictions, 74% of Federal/national labs, and 69% of county labs.

Type of jurisdiction	Percent of labs with LIMS
All laboratories	75%
State/regional	88%
County	69
Municipal	29
Federal/national	74

Evidence processing

Publicly funded crime laboratories in 2002 received 2,695,269 new cases – evidence submitted from a single criminal investigation that may include multiple requests for forensic services – and ended the year with a backlog of 262,637 cases (table 9).

Overall, labs received a median 4,429 cases in 2002 and ended the year with a median backlog of 370 cases. Larger labs typically handled more cases; those having 100 or more FTEs received a median 31,388 cases and ended the year with a median backlog of 3,190 cases.

In contrast, the smallest labs – those having fewer than 10 FTEs – received a median 1,997 cases and ended the year with a median backlog of 101 cases.

Labs serving State or regional jurisdictions received about 1.1 million cases in 2002 (or 42% of all cases) (table 10). The median number of cases received by these labs was about 4,000 cases. These labs ended the year with a backlog of about 145,000 cases – 55% of the total backlog – and the median backlog was about 472 cases.

Labs serving county jurisdictions received about 791,000 cases in 2002, or 29% of the total. The median number of cases received in these labs was about 5,756 cases. These labs ended the year with nearly 59,000 backlogged cases – 22% of the total –

and the median backlog was about 520 cases.

Labs serving municipal jurisdictions received about 684,000 cases in 2002 (a quarter of all cases), and had the highest median (about 5,933 cases). These labs had a yearend backlog of about 53,075 cases – or 19% of the total – and had a median backlog of about 153 cases.

Labs serving Federal or national jurisdictions received about 86,160 cases in 2002, or about 3% of the total, and had the lowest median (about 1,296 cases). These labs ended the year with nearly 8,776 backlogged cases – 3% of the total – and had a median backlog of about 136 cases.

Table 9. Cases received and yearend case backlog, by size of laboratory, 2002

Number of FTE employees	Cases received during 2002		Cases backlogged at yearend	
	Total	Median	Total	Median
All laboratories	2,695,269	4,429	262,637	370
100 or more	567,725	31,388	53,883	3,190
50 to 99	692,067	11,983	74,445	1,100
25 to 49	640,145	7,102	63,459	784
10 to 24	581,036	4,590	53,075	347
Fewer than 10	214,296	1,997	17,775	101

Note: Case data for some labs are imputed. See *Methodology* section, page 15, for detail.

Table 10. Cases received and yearend case backlog, by type of jurisdiction served, 2002

Type of jurisdiction	Cases received during 2002		Cases backlogged at yearend	
	Total	Median	Total	Median
All laboratories	2,695,269	4,429	262,637	370
State/regional	1,133,702	4,092	145,167	472
County	791,310	5,756	58,804	521
Municipal	684,097	5,933	49,890	153
Federal/national	86,160	1,296	8,776	136

Note: Case data for some labs are imputed. See *Methodology* section, page 15, for detail.

Publicly funded crime laboratories began 2002 with a backlog of about 290,000 requests for forensic services (table 11). These labs received an additional 2.7 million requests during 2002 and completed nearly 2.5 million requests.

A typical lab in 2002 had a backlog of about 390 requests, received 4,900 new requests, completed 4,600 requests, and finished the year with a backlog of about 650 requests (median values).

The total estimated backlog at yearend – about 501,000 requests – represents an increase of 211,000 requests, or 73%, from the backlog at the beginning of the year. Overall, for every five requests completed by publicly funded crime laboratories in 2002, one request was outstanding at yearend.

Seventy-three percent of the total backlogged requests at yearend 2002 were attributable to controlled substances (46%), latent prints (17%), and DNA analysis (10%).

Controlled substances

Almost half of all new requests (about 1.3 million requests, or 48%) for analysis were for controlled substances, in

the form of pills, powders, vegetable matter (for example, marijuana), and other residues.

A typical lab performing analyses of controlled substances received about 3,000 such requests during 2002.

Labs performing controlled substances analysis processed a total of nearly 1.2 million requests during 2002, with a typical lab completing about 2,800 requests. These labs ended the year with about 233,000 backlogged requests, or about 290 requests per lab on average.

Overall, for every five controlled substance requests completed in 2002, about one request was outstanding at yearend.

Latent prints

About 274,000 new requests (or 10% of all new requests) were for analysis of latent prints. A typical lab performing latent prints analysis received about 860 such requests during 2002.

Labs performing latent prints analysis processed about 238,000 requests during 2002, with a typical lab completing about 790 requests. These labs ended the year with about 86,000

backlogged requests, or about 140 requests per lab on average.

For every three latent print requests completed in 2002, approximately one request was outstanding at yearend.

DNA analysis

Just 2% of all new requests – about 61,000 requests – were in the area of DNA analysis. A typical lab performing DNA analysis received about 250 such requests during 2002.

Labs performing DNA analysis processed nearly 42,000 requests, with a typical lab completing about 170 requests. These labs ended the year with about 49,000 backlogged requests, or about 130 requests on average.

For every five DNA analysis requests completed in 2002, approximately six requests remained outstanding at yearend.

As would be expected, larger labs processed a greater volume of requests than smaller labs during 2002 (table 12). Although the overall median backlog at the beginning of the year was about 390 requests, the median ranged from 70 requests among the

Table 11. Requests for forensic services and estimated yearend backlog in the Nation's publicly funded forensic crime laboratories, by type of function, 2002

Type of function	Backlogged requests as of January 1, 2002		New requests received during 2002		Requests completed in 2002		Estimated backlogged requests at yearend	
	Total	Median	Total	Median	Total	Median	Total	Median
Total	289,938	394	2,706,785	4,892	2,495,313	4,559	501,410	646
Controlled substances	95,404	171	1,291,488	3,045	1,154,221	2,822	232,671	294
Biology screening	18,456	66	88,857	381	76,332	332	30,981	102
Firearms/toolmarks	22,636	43	104,068	290	88,997	240	37,707	65
Crime scene	1,579	0	166,588	65	165,461	53	2,706	1
Latent prints	50,245	119	274,225	860	238,135	786	86,335	140
Trace	9,997	30	41,531	132	36,878	124	14,650	40
DNA analysis	29,516	72	60,887	246	41,592	172	48,811	131
Toxicology	17,523	30	467,752	1,541	455,624	1,457	29,651	51
Questioned documents	3,391	23	16,683	131	15,562	123	4,512	27
Computer crimes	952	20	2,839	49	2,757	45	1,034	34
Other functions	40,239	12	191,867	165	219,754	107	12,352	21

Note: Examples of forensic services listed by labs in 'other functions' category include fire debris, polygraph, shoe/tire print, and digital imaging. Backlog data should be interpreted with caution for a variety of reasons. First, some laboratories may not have included pending requests that had been logged in December of the year prior to the reference period, but were not yet 30 days old. As such, backlogged requests may represent a subset of total pending requests for some laboratories. Second, in State laboratory systems requests may occasionally be moved between laboratories, with the initial request being logged at one laboratory and the completion at another laboratory. Third, some complex cases may start with an initial request and evolve into multiple requests. The additional work may be completed without logging additional requests. Finally, data were imputed for labs that did not provide complete forensic request processing information. See *Methodology* section, page 15, for greater detail. Collectively, these concerns suggest that the backlog estimates are conservative and that the actual backlog may be greater than estimated.

smallest labs to nearly 5,200 requests among the largest.

Likewise, the median number of new requests ranged from about 1,700 among the smallest labs to over 35,000 among the largest; median completed requests ranged from about 1,600 to over 37,000; and median yearend backlog ranged from about 70 to nearly 3,700 requests.

Labs serving county jurisdictions had the lowest median backlog at the beginning of the year, about 360 requests (table 13). These labs received a median 5,300 requests during 2002, completed about 4,900 requests, and finished the year with a backlog of about 690 requests.

Municipal labs had a median backlog of about 390 requests at the beginning of the year. These labs received a median 5,400 requests during 2002 and completed about 5,000. Municipal labs had the lowest median yearend backlog – about 400 requests.

State or regional labs had a median backlog of about 400 requests at the beginning of the year. These labs received a median 4,400 requests during 2002, completed about 4,200, and finished the year with a backlog of about 650 requests.

Labs serving Federal or national jurisdictions had the highest median backlog at the beginning of the year, about 430 requests. These labs received a median 5,500 requests, completed about 4,900 requests, and finished the year with the highest median backlog – about 860 requests.

Standard protocols

Standard protocols are an important consideration in explaining resource needs because the complexity of a protocol will affect the speed with which exams can be completed and the volume of requests that can be processed on an annual basis. A protocol that requires an analyst to follow prescribed steps, while enhancing completeness and reliability, may slow the speed with which samples are processed.

Table 12. Median number of requests for forensic services and estimated yearend backlog in the Nation's publicly funded forensic crime laboratories, by size of laboratory, 2002

Number of FTE employees	Median number of –			
	Backlogged requests as of January 1, 2002	New requests received	Requests completed	Backlogged requests at yearend
All laboratories	394	4,892	4,559	646
100 or more	5,164	35,146	37,201	3,682
50 to 99	1,343	12,949	11,854	1,816
25 to 49	678	6,963	6,458	1,426
10 to 24	373	4,776	4,335	520
Fewer than 10	70	1,705	1,610	72

Table 13. Median number of requests for forensic services and estimated yearend backlog in the Nation's publicly funded forensic crime laboratories, by type of jurisdiction served, 2002

Number of FTE employees	Median number of –			
	Backlogged requests as of January 1, 2002	New requests received	Requests completed	Backlogged requests at yearend
All laboratories	394	4,892	4,559	646
State/regional	404	4,412	4,234	651
County	362	5,347	4,926	694
Municipal	387	5,447	4,966	403
Federal/national	434	5,460	4,944	858

Procedures included in standard protocols for latent prints, 2002

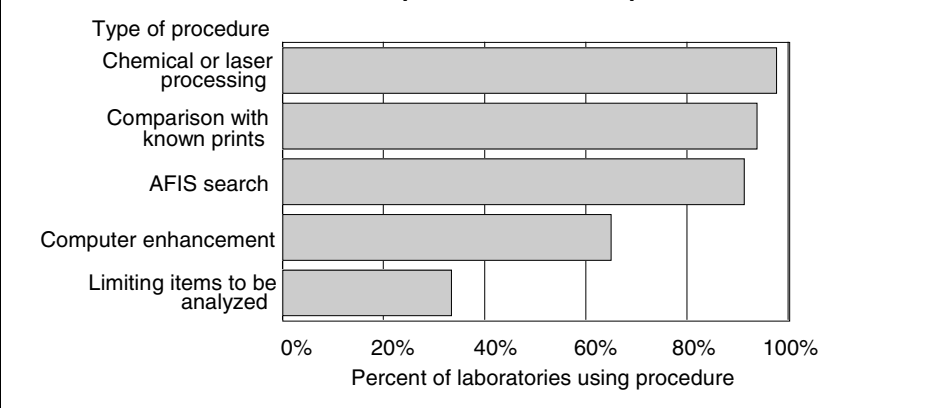


Figure 2

Fingerprint examination

Fingerprint examination is one of the oldest specialty areas within the forensic sciences, and one that has resisted firm standards for how to examine a print and the criteria to be used in making an identification. Fingerprint examination is also an area in which the experience of the examiner and individual judgment are considered paramount.

Ninety-seven percent of labs conducting fingerprint examination reported they have a standard protocol for fingerprint examination. Of these labs, more than 90% report they *process* them (that is, chemically or via laser examination), *compare* them with known prints, and use an AFIS (Automated Fingerprint Identification System) to search a database (figure 2). AFIS enables investigators to consult large local, State, and national databases to determine the identity of prints of unknown origin found at crime

scenes. Two-thirds of laboratories reported they regularly enhance latent prints using computer techniques. A third of labs report they routinely limit the number of items examined; crime scenes may yield many latent prints and the majority of labs report they examine all that are recovered.

Controlled substances

Almost all laboratories (98%) that examine controlled substances have standard protocols. This is to be expected because the field as a whole has agreed to the minimum wet chemical and instrumental means needed to identify a particular controlled substance.

Most labs (71%) attempt to limit the drugs they seek to identify (figure 3). This is not unexpected given the large drug-related caseloads, and many labs examine only a representative sample of the total drug seizure and/or conclude their testing once they identify a controlled substance that supports the state's prosecution.

Drug seizures are commonly composed of "cutting agents" that dilute the purity of the sample and may also be used to determine the point or manufacturer of origin. Unlike other forms of evidence, however, examiners do not usually attempt to determine a drug's manufacturer or point of origin. About a quarter of the labs report they identify adulterants and/or diluents in the samples and issue preliminary findings based on these analyses.

More laboratories are experimenting with managerial and technical steps to reduce their caseloads and the time for analyses and giving testimony in court. Whereas labs once proceeded with a complete analysis when a suspected controlled substance was submitted – regardless of input from any other criminal justice agency – more laboratories today are requiring proof from the police and/or prosecutor that the case will proceed (that is, be prosecuted) before continuing with a complete analysis.

Procedures included in standard protocols for controlled substances, 2002

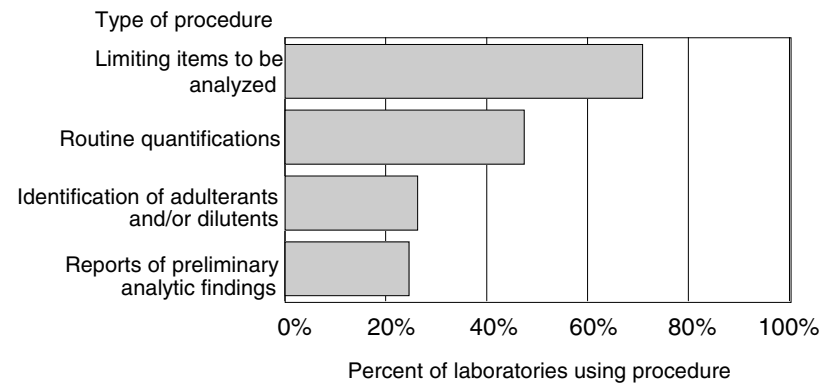


Figure 3

Procedures included in standard protocols for DNA analysis, 2002

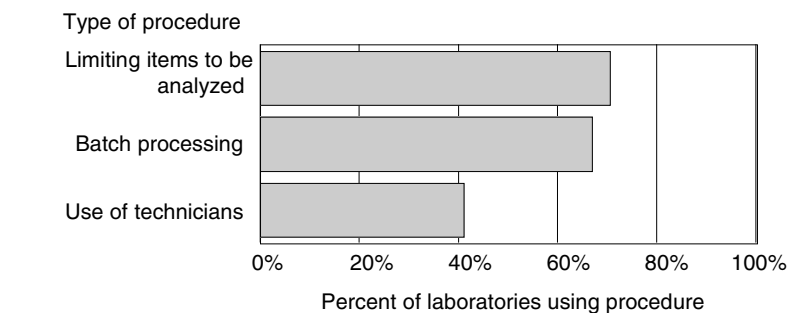


Figure 4

DNA testing

Almost all laboratories (98%) that perform DNA analysis follow a standard protocol for DNA testing. DNA testing has been the subject of great scientific and legal scrutiny, and, as a result, forensic DNA analysts have adopted protocols acceptable to both legal and scientific communities.

In addition to requiring an accepted laboratory protocol, specific steps included limiting the number of items examined (70%), by asking investigators/prosecutors to be explicit in what questions they expect the DNA tests to answer, and handling the samples via batch processing (66%) (figure 4). Both steps enable laboratories to focus on particular stains and save the laboratory time and expense.

Forty-one percent of the laboratories indicated they use technicians in DNA testing, a step that calls for personnel with less training and experience to examine garments and to select stains

that will likely yield scientific results that may help to resolve a critical question in the case.

Performance expectations

Performance expectations of examiners vary depending on the complexity of examinations in different evidence areas. Analysts are expected to perform large numbers of controlled substance and toxicology examinations annually, given that the purpose of the exam is to identify the substance in question. For most other examination areas, examiners compare evidence of unknown origin with standards of known origin, to determine whether the evidence and standard originated from the same source. These latter types of examinations typically require a longer period for analysis.

Crime laboratory directors in 2002 expected their controlled substances analysts to process nearly 900 requests per FTE examiner (table 14). Likewise, the median expectation for toxicology analysts was nearly 500 requests per FTE examiner. The next highest category was latent prints, where the median expectation was 264 requests per FTE examiner.

Expected performance was much lower in all other categories, where examiners typically attempt not only to identify the evidence, but to associate that evidence with a suspect, weapon, or some other instrument of the crime. Expectations for computer investigations and DNA analysis – 2 areas where procedures may be very time consuming and interpretations complex – were the lowest of the 10 categories.

Overall, examiners in the Nation's crime laboratories processed requests at or above 90% of the expected averages in 8 of the 10 listed categories, and exceeded expected performance in two of these areas – latent prints and toxicology. Analysts processed requests in the remaining two categories, firearms/toolmarks and computer crimes, at about 80% of the expected average.

Human resource needs

Overall, publicly funded laboratories estimated that an additional 1,917

FTEs would be needed in order to achieve a 30-day turnaround on all requests for forensic services received in 2002 (table 15). The estimated total cost of the additional FTEs exceeds \$70.2 million, with a median per lab cost of \$161,000.

Over half (54%) of the needed FTEs were in three areas: DNA analysis (19%); controlled substances (19%); and latent prints (16%).

DNA analysis

Labs performing DNA analysis estimated that about 370 additional FTEs would have been needed to achieve a 30-day turnaround on all DNA analysis requests received during 2002, given current laboratory conditions and analysis tools. These additional FTEs represent a 79% increase in FTEs currently performing DNA analysis. The estimated cost of these additional FTEs exceeds \$14.4 million, with a median per lab cost of \$82,100.

Controlled substances

Labs performing analysis of controlled substances estimated that 355 additional FTEs would have been needed to achieve a 30-day turnaround on all such requests received during 2002. These additional FTEs represent a 16% increase in FTEs currently performing controlled substance

Table 14. Expected and actual requests completed per examiner FTE, by type of function, 2002

Type of function	Median requests	
	Expected	Actual
Controlled substances	892	810
Biology screening	159	153
Firearms/toolmarks	142	115
Crime scene	96	86
Latent prints	264	286
Trace	100	93
DNA analysis	74	67
Toxicology	490	614
Questioned documents	100	98
Computer crimes	60	46

Note: Table includes labs that reported both expected and actual performance data in listed categories.

analysis. The estimated cost of additional FTEs needed for analysis of controlled substances exceeds \$11.2 million, with a median per lab cost of \$50,300.

Latent prints

Labs performing latent print analysis estimated that about 300 additional FTEs would have been needed to achieve a 30-day turnaround on all such requests received during 2002. These additional FTEs represent a 51% increase in FTEs that were currently performing latent print services. The estimated cost of these additional FTEs exceeds \$10.4 million, with a median cost of \$69,400 per lab.

Table 15. Estimated additional personnel needs in order to achieve a 30-day turnaround on all requests for forensic services received, by type of function, 2002

Type of function	Number of FTEs currently performing function		Number of additional FTEs needed to achieve 30-day turnaround		Estimated cost of additional FTEs	
	Total	Median per lab	Total	Median per lab	Total	Median per lab
Total	5,813	9	1,917	2	\$70,208,000	\$161,000
Controlled substances	2,232	4	355	1	\$11,253,000	\$50,300
Firearms/toolmarks	448	2	196	1	7,238,000	40,700
Biology screening	347	2	165	1	6,053,000	50,200
DNA analysis	465	3	369	2	14,421,000	82,100
Latent prints	582	3	298	1	10,488,000	69,400
Trace	322	2	150	1	\$5,733,000	\$49,200
Crime scene	564	4	75	0	2,753,000	73,700
Toxicology	466	2	145	1	5,359,000	50,000
Questioned documents	119	2	56	0	2,405,000	38,400
Computer crimes	82	2	63	1	3,304,000	56,000
Other functions	162	1	31	0	\$1,149,000	\$39,300

Note: Estimated cost is based on starting salaries of analysts or examiners, and does not include benefits or other personnel costs. Some labs did not provide information for this table. Detail may not sum to total due to rounding.

Outsourcing laboratory services

Crime laboratories address the problem of rising caseloads by outsourcing various types of analyses. DNA analysis is an area where demand has increased in recent years as laboratories try to keep up with expanding casework as well as examining samples to enter into convicted offender computerized databases that belong to the Combined DNA Index System (CODIS).

DNA analysis is one area in which many private laboratories are equipped to perform forensic casework. Fewer private laboratories engage in more traditional forensic work such as firearms and trace analysis. Publicly funded labs have elected to divert cases to such facilities to partially relieve caseload pressure. Once private labs satisfy accreditation standards set by the field, public crime labs will use them to handle routine cases.

Forty-one percent of publicly funded laboratories reported outsourcing one or more types of forensic services in 2002 (table 16). Outsourcing was more common among larger labs, with 71% of the largest labs – those having 100 or more FTEs – reporting some type of outsourcing. About a quarter of the smallest labs reported some type of outsourcing.

Nearly two-thirds of labs serving municipal jurisdictions reported outsourcing some requests for forensic services in 2002 (table 17). Forty-two percent outsourced DNA casework, and 26% outsourced toxicology requests.

Fifty-seven percent of labs serving county jurisdictions outsourced requests in 2002. Thirty-two percent outsourced toxicology requests, and 28% outsourced DNA casework.

About a third of labs serving State or regional jurisdictions outsourced requests in 2002. Thirteen percent outsourced CODIS samples, and 12% outsourced DNA casework.

Table 16. Outsourcing of requests for forensic services, by size of laboratory, 2002

Number of FTE employees	Any outsourcing	Percent of labs outsourcing --			
		DNA analysis	Toxicology	CODIS samples	Controlled substances
All laboratories	41%	19%	14%	9%	5%
100 or more	71%	43%	21%	21%	0%
50 to 99	64	28	17	19	3
25 to 49	42	22	11	13	4
10 to 24	42	17	18	7	6
Fewer than 10	24	10	10	1	5

Table 17. Outsourcing of requests for forensic services, by type of jurisdiction served, 2002

Type of jurisdiction	Any outsourcing	Percent of labs outsourcing --			
		DNA analysis	Toxicology	CODIS samples	Controlled substances
All laboratories	41%	19%	14%	9%	5%
State/regional	34%	12%	7%	13%	11%
County	57	28	32	6	4
Municipal	63	42	26	3	4
Federal/national	11	0	0	0	0

Eleven percent of labs serving Federal or national jurisdictions reported outsourcing requests in 2002. These requests were in the area of digital evidence (computer crimes) and other unspecified areas.

Overall, labs outsourced nearly 240,000 requests for forensic services in 2002. The majority of these requests (91%) were DNA-related. These included nearly 13,000 casework requests and 205,000 CODIS samples.

Labs outsourcing DNA-related requests spent nearly \$4.4 million on casework requests and \$5.9 on CODIS samples. The median cost per outsourced request was nearly \$1,200 for casework, and just \$30 for CODIS samples.

In addition to DNA-related requests, about 14,300 toxicology and 6,000 controlled substances requests were outsourced in 2002. Labs outsourcing in these areas spent \$990,000 on toxicology requests and \$450,000 on controlled substances requests. The median cost per outsourced toxicology request was \$138. For controlled substances, the median cost was \$88 per outsourced request.

Quality, training, and research

Accreditation

Seventy-one percent of publicly funded laboratories in 2002 were accredited by some type of professional organization. Larger labs were more likely to be accredited, including more than 80% of labs having 25 or more FTEs and more than 70% of labs having 10 to 24 FTEs (table 18). About half (51%) of the smallest labs were accredited.

Labs serving a State or regional jurisdiction were most likely to be accredited (79%), and labs serving a municipal jurisdiction, the least (47%) (table 19).

Table 18. Publicly funded labs accredited by professional organizations, by size of laboratory, 2002

Number of FTE employees	Percent of labs accredited by --	
	ASCLD-LAB	Other organization
All laboratories	61%	10%
100 or more	73%	13%
50 to 99	71	15
25 to 49	75	9
10 to 24	58	15
Fewer than 10	46	5

Table 19. Publicly funded labs accredited by professional organizations, by jurisdiction served, 2002

Type of jurisdiction	Percent of labs accredited by --	
	ASCLD-LAB	Other organization
All laboratories	61%	10%
State/regional	71%	8%
County	50	16
Municipal	37	10
Federal/national	54	13

Sixty-one percent of labs were accredited by the American Society of Crime Laboratory Directors Lab Accreditation Board (ASCLD-LAB). This includes more than 70% of labs having 25 or more FTE employees, and about 60% of those having 10 to 24 FTEs. Less than half of the smallest labs were accredited by ASCLD-LAB.

Labs having a State or regional jurisdiction were the most likely to be ASCLD-LAB accredited (71%), and labs with municipal jurisdictions were least likely (37%).

Proficiency testing

Ninety-seven percent of publicly funded laboratories in 2002 were engaged in proficiency testing, a procedure that has become an essential quality assurance practice over the past 30 years. Proficiency testing was slightly less common among smaller labs (those having fewer than 10 FTEs) and among labs serving municipal jurisdictions, although a strong majority of labs in both categories did engage in such testing.

	Percent of labs engaged in proficiency testing, 2002
Number of FTE employees	
All laboratories	97%
100 or more	100%
50 to 99	100
25 to 49	100
10 to 24	99
Fewer than 10	92
Type of jurisdiction	
All laboratories	97%
State/regional	99%
County	94
Municipal	90
Federal/national	100

Types of proficiency tests used for analysts/examiners, 2002

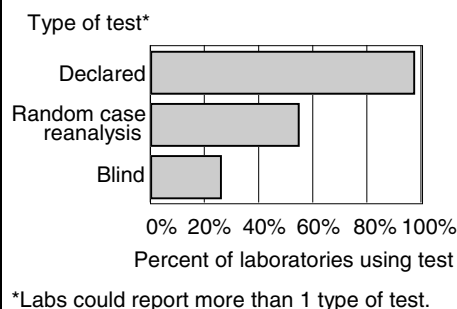


Figure 5

Among the labs engaged in proficiency testing, almost all (97%) use *declared tests*, a type of test in which the examiner knows he/she is being tested (figure 5).

Another testing process that has gained favor over the past several years is *random case reanalysis*, where examiners' completed prior casework is randomly selected for

reanalysis by a supervisor or another examiner. A little over half (54%) of laboratories engaged in proficiency testing use this type of test. Twenty-six percent of the labs engaged in proficiency testing use *blind tests*, a type of test in which the examiner doesn't know the sample being analyzed is a test sample.

Almost all (98%) of laboratories engaged in proficiency testing used tests that were generated externally (not shown in a table). External tests allow the laboratory to compare its results against other laboratories engaged in similar testing.

In addition to external tests, 74% of laboratories engaged in proficiency testing used internally generated tests. For example, a laboratory director or supervisor or a quality control unit may create test samples. Externally generated proficiency tests are generally deemed a more objective measure of a laboratory's performance.

The Federal Bureau of Investigation (FBI) Laboratory

The FBI Laboratory Division is the largest publicly funded forensic crime laboratory in the United States, with 585 FTE employees as of January 2004. The FBI lab is more than twice as large as the next largest publicly funded crime lab.

The FBI lab provides a full range of forensic services, including all of those catalogued by the BJS census of forensic crime labs.

The FBI's fiscal budget for laboratory operations is about \$172.2 million, nearly 8 times greater than the operating budget of the next largest publicly funded crime lab. The total budget includes about \$31.5 million (or 18% of the total) for research and development.

The FBI lab began 2003 with an estimated backlog of 3,062 requests for forensic services. About two-thirds of the backlog was attributable to latent prints requests.

During 2003, the FBI lab received 6,994 new requests and completed 7,403 requests. The estimated yearend backlog was 2,653 requests, a 13% reduction in total backlog from the beginning of the year. Latent print requests comprised half of the yearend 2003 backlog.

By the end of the first quarter of 2004, the FBI lab reported a total backlog of 2,585 requests. This included 1,216 latent print requests, or 47% of the total.

The FBI laboratory reported a need for additional equipment and 249 additional FTEs in order to have achieved a 30-day turnaround on all 2003 requests. The cost of the additional equipment was estimated to be \$40 million. Based on starting salaries for analyst/examiners, the estimated cost of the additional FTE's exceeds \$17.5 million.

Training and research

About half (52%) of publicly funded laboratories in 2002 dedicated resources to *training*, defined as ‘a structured interaction process with the function of teaching the history, theories, and/or the application of those scientific techniques and methods that are utilized within the crime laboratory.’

Nearly 80% of labs having 50 to 99 FTEs and nearly 60% of those having 100 or more FTEs reported having resources dedicated to training. Slightly less than half of labs having 10 to 49 FTEs dedicated resources to training.

Number of FTE employees	Percent of labs with resources dedicated to training, 2002
All laboratories	52%
100 or more	57%
50 to 99	78
25 to 49	44
10 to 24	44
Fewer than 10	54

By type of jurisdiction served, 74% of labs having federal or national jurisdictions and 63% of labs having municipal jurisdictions reported having resources dedicated to training. Less than half of labs serving State or regional jurisdictions had resources dedicated to training.

Type of jurisdiction	Percent of labs with resources dedicated to training, 2002
All laboratories	52%
State/regional	47%
County	54
Municipal	63
Federal/national	74

Twelve percent of laboratories dedicate resources to *research*, defined as ‘experimentation aimed at the discovery and interpretation of facts, the revision of accepted theories, or practical application of such new or revised theories or technologies.’

Number of FTE employees	Percent of labs with resources dedicated to research, 2002
All laboratories	12%
100 or more	21%
50 to 99	32
25 to 49	13
10 to 24	6
Fewer than 10	7

Larger labs were more likely to have resources dedicated to research. Thirty-two percent of labs having 50 to 99 FTEs and 21% of those with 100 or more FTEs had resources dedicated to research. Less than 10% of labs having fewer than 25 FTEs had resources dedicated to research.

Type of jurisdiction	Percent of labs with resources dedicated to research, 2002
All laboratories	12%
State/regional	8%
County	12
Municipal	11
Federal/national	53

More than half (53%) of labs serving Federal or national jurisdictions had resources dedicated to research, while about 10% of labs serving other types of jurisdictions had such resources.

Budget and pay

Operating budgets

Obtaining information on budgets is difficult because some laboratories are units of larger scientific and/or law enforcement systems that do not have accurate figures on an individual lab’s expenditures. For example, personnel expenditures, facility leases, and

equipment contracts might be covered by a centralized unit. Because of these difficulties, budget figures should be considered with care.

Publicly funded crime labs in 2002 had estimated total annual budgets exceeding \$750 million (table 20). The median annual budget per laboratory was \$1.3 million, ranging from \$359,000 among the smallest labs to \$8.7 million among the largest.

On a per employee basis, the median operating budget was \$125,600 per analyst/examiner and \$74,200 per FTE employee. Medium-sized labs – those having 25 to 49 FTEs – had the highest median operating budgets on a per employee basis – \$155,500 per analyst/examiner and \$89,800 per FTE.

Laboratories serving State or regional jurisdictions accounted for about \$400 million, or 53% of the total (table 21). County labs accounted for \$155 million (21%) and municipal labs, \$100 million (13%). Labs serving Federal or national jurisdictions accounted for \$96 million, or about 13% of the total.

On a per laboratory basis, those serving Federal or national jurisdictions had the highest median budgets at nearly \$2.6 million. Median budgets in labs serving other types of jurisdictions ranged from \$1.2 million (State or regional) to \$1.6 million (municipal).

Labs serving Federal or national jurisdictions had the highest median operating budgets on a per employee basis – \$163,500 per analyst/examiner

Table 20. Operating budget of publicly funded laboratories, by size of laboratory, 2002

Number of FTE employees	Total operating budget, 2002	Median operating budget per --		
		Laboratory	Analyst / examiner	FTE employee
All sizes	\$752,139,000	\$1,346,000	\$125,600	\$74,200
100 or more	\$160,981,000	\$8,700,000	\$116,600	\$68,200
50 to 99	222,021,000	4,447,000	117,300	64,900
25 to 49	197,099,000	3,070,000	155,500	89,800
10 to 24	130,138,000	1,152,000	123,700	74,500
Fewer than 10	41,900,000	359,000	125,900	67,800

Note: Total and per agency figures are rounded to the nearest \$1,000; per analyst/examiner and per employee figures, to the nearest \$100. Budget data for some labs are imputed. See *Methodology* section for greater detail.

Table 21. Operating budget of publicly funded laboratories, by type of jurisdiction served, 2002

Type of jurisdiction	Total operating budget, 2002	Median operating budget per –		
		Laboratory	Analyst / examiner	FTE employee
All sizes	\$752,139,000	\$1,346,000	\$125,600	\$74,200
State/regional	\$401,189,000	\$1,165,000	\$120,200	\$74,000
County	154,712,000	1,488,000	140,800	87,600
Municipal	100,369,000	1,557,000	123,200	61,100
Federal/national	95,868,000	2,588,000	163,500	105,000

Note: Total and per agency figures are rounded to the nearest \$1,000; per analyst/examiner and per employee figures, to the nearest \$100. Budget data for some labs are imputed. (See *Methodology* section for greater detail.)

Table 22. Laboratories receiving at least some funding from various sources, by size of laboratory, 2002

Number of FTE employees	Percent of labs receiving funding from –				
	State government	Local government	Federal Government	Grants	Fees
All laboratories	67%	41%	21%	55%	29%
100 or more	73%	36%	36%	82%	18%
50 to 99	63	47	23	77	37
25 to 49	76	45	26	57	33
10 to 24	61	44	18	56	25
Fewer than 10	69	34	18	40	28

Note: Labs serving Federal/national jurisdictions are excluded from this table.

Table 23. Laboratories receiving at least some funding from various sources, by type of jurisdiction served, 2002

Type of jurisdiction	Percent of labs receiving funding from –				
	State government	Local government	Federal Government	Grants	Fees
All laboratories	67%	41%	21%	55%	29%
State/regional	96%	9%	29%	53%	31%
County	28	91	7	61	30
Municipal	14	97	9	53	16

Note: Labs serving Federal/national jurisdictions are excluded from this table.

and \$105,000 per FTE. Labs serving State or regional jurisdictions had the lowest - \$120,200 per analyst/examiner and \$74,200 per FTE.

Budget categories

The largest operating budget category was personnel, typically accounting for nearly 80% of labs' total operating budgets. About 15% of laboratory budgets were typically devoted to supplies (7%), equipment (5%), and services (3%). Facilities and travel each accounted for about 1% of labs' operating budgets.

Budget category	Median percentage of total operating budgets, 2002
Personnel	79%
Supplies	7
Equipment	5
Services	3
Facilities	1
Travel	1
Training	--
Quality assurance	--

Note: Table does not include 'other' costs.
--Less than 0.5%.

While most laboratories are engaged in quality assurance programs like proficiency testing, accreditation, and methods validation, only a small proportion of laboratory operating budgets (typically less than 1%) is devoted to training or quality assurance.

Funding sources

Excluding labs having Federal or national jurisdictions, for which all funding was derived from Federal sources, 67% of labs reported receiving at least some funding from State sources (table 22). Forty-one percent of laboratories reported receiving at least some funding from local sources.

Twenty-one percent of laboratories reported receiving at least some funding from Federal sources. Federal funding was more likely among larger labs, including 36% of those having 100 or more FTEs. In contrast, about 18% of labs having less than 25 FTEs reported receiving Federal funding.

Over half (55%) of labs reported receiving at least some funding from grants. Grant funding was more likely among larger labs, including 82% of those having 100 or more FTEs. Forty percent of the smallest labs received grant funding.

About 3 in 10 labs reported receiving fees for services.

Labs receiving State funding included 96% of those serving State or regional jurisdictions, 28% of county labs, and 14% of municipal labs (table 23). Recipients of local governmental funding included 97% of labs serving municipal jurisdictions, 91% of county labs, and 9% of State or regional labs. Federal funding was reported by 29% of labs serving State or regional jurisdictions, 9% of municipal labs, and 7% of county labs.

Labs receiving grant funding included 61% of those serving county jurisdictions, and 53% of those serving municipal, State or regional jurisdictions. About 3 in 10 county, State, and regional labs received fees for services. Sixteen percent of municipal labs received such fees.

Average proportion of laboratory budgets from Federal, State, and local sources, by type of jurisdiction served, 2002

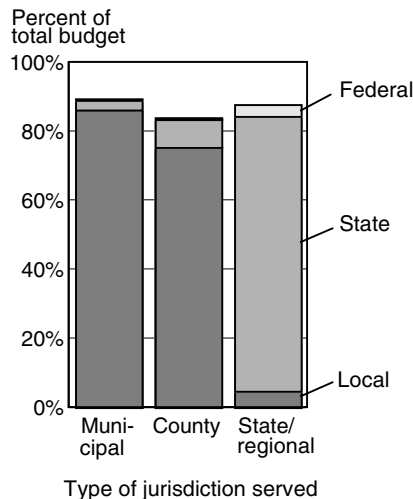


Figure 6

Among labs serving municipal jurisdictions, the greatest share of laboratory budgets was funding from local governments. Local funding comprised 86% of municipal laboratory budgets on average (figure 6). Three percent was from State governments,

and less than half of 1% was from the Federal Government.

Similarly, funding from local governments comprised 75% of county laboratory budgets on average. Eight percent was from State governments, and less than half of 1% was from the Federal Government.

Labs serving State or regional jurisdictions received 5% of their total budgets from local governments, on average. The greatest share of State or regional laboratory budgets came from State governments, about 80% on average. Three percent was from Federal Government.

Grants and fees contribute significantly to laboratory operating budgets. On average, the percentage of total budgets attributable to grant funds is 10% among labs serving county jurisdictions, 8% among municipal labs, and 5% among State or regional laboratories.

The average percentage of total budgets attributable to fees is 7% among labs serving State or regional

jurisdictions, 4% among county labs, and half of 1% among municipal laboratories.

Salaries

Overall, median salaries for laboratory directors ranged from \$65,000 to \$89,200 annually; for mid-level supervisors, the range was \$49,800 to \$75,600; for analyst/examiners, \$35,400 to \$63,000; and for technicians, \$26,400 to \$40,200 (table 24).

In general, salary ranges were higher among larger labs, and lower among smaller labs. For example, median salaries for laboratory directors ranged from \$78,800 to \$110,900 among labs with 100 or more FTEs, and from \$55,700 to \$79,700 among labs with fewer than 10 FTEs.

Median salaries for supervisors ranged from \$61,000 to \$80,800 among labs with 100 or more FTEs, and from \$47,100 to \$65,000 among labs with fewer than 10 FTEs. Analyst or examiner salaries ranged from \$36,200 to \$77,000 among the largest labs, and from \$34,100 to \$57,500 among the

Table 24. Median base annual salary for selected positions in publicly funded laboratories, by size of laboratory, 2002

Number of FTE employees	Median base annual salary, 2002							
	Technical support		Analyst/examiner		Supervisor		Director	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
All laboratories	\$26,400	\$40,200	\$35,400	\$63,000	\$49,800	\$75,600	\$65,000	\$89,200
100 or more	\$29,000	\$42,800	\$36,200	\$77,000	\$61,000	\$80,800	\$78,800	\$110,900
50 to 99	27,000	42,700	36,000	67,000	49,700	80,100	66,000	95,400
25 to 49	26,500	42,700	36,300	67,500	54,000	77,600	69,800	95,800
10 to 24	25,800	38,400	35,000	62,000	49,800	74,200	61,000	83,800
Fewer than 10	25,900	35,000	34,100	57,500	47,100	65,000	55,700	79,700

Note: Salary figures have been rounded to the nearest \$100.

Table 25. Median base annual salary for selected positions in publicly funded laboratories, by type of jurisdiction served, 2002

Type of jurisdiction	Median base annual salary, 2002							
	Technical support		Analyst / examiner		Supervisor		Director	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
All laboratories	\$26,400	\$40,200	\$35,400	\$63,000	\$49,800	\$75,600	\$65,000	\$89,200
State/regional	\$25,000	\$39,600	\$33,200	\$59,800	\$47,800	\$74,500	\$59,000	\$83,800
County	26,600	39,900	40,100	66,500	55,600	75,400	68,200	93,500
Municipal	30,100	42,700	38,600	62,300	49,800	77,200	65,000	89,000
Federal/national	27,500	52,800	35,100	93,000	80,000	109,300	96,000	124,800

Note: Salary figures have been rounded to the nearest \$100.

smallest. Salaries for technical support personnel ranged from \$29,000 to \$42,800 among the largest labs and from \$25,900 to \$35,000 among the smallest.

Median salary ranges were also generally higher among labs serving Federal or national jurisdictions, and lower among those serving State or regional jurisdictions (table 25). For example, median salaries ranged from \$96,000 to \$124,800 for directors of Federal or national labs, and from \$59,000 to \$83,800 for directors of State or regional labs.

Salary ranges for supervisors ranged from \$80,000 to \$109,300 among Federal or national labs, and from \$47,800 to \$74,500 among State or regional labs. Analyst or examiner salaries ranged from \$35,100 to \$93,000 among Federal or national labs and from \$33,200 to \$59,800 among State or regional labs. Salaries for technical support personnel ranged from \$27,500 to \$52,800 among federal or national labs and from \$25,000 to \$39,600 among State or regional labs.

Methodology

The Bureau of Justice Statistics (BJS) awarded grant no. 2002-BJ-CX-K011 to the University of Illinois at Chicago (UIC) to undertake the 2002 Census of Publicly Funded Forensic Crime Laboratories. UIC partnered with the American Society of Crime Laboratory Directors (ASCLD) and the UIC Survey Research Laboratory (SRL) to administer the census.

The survey instrument was designed by project staff with input from BJS staff and the ASCLD advisory committee. The survey was pre-tested with 10 laboratories representing different sized facilities (by number of FTE scientists) and governmental affiliations (Federal, State, and local).

ASCLD provided UIC with a mailing list of 469 facilities that self-identified as crime laboratories, and which ASCLD used for membership purposes. Advance letters were mailed to all laboratories followed by telephone screening. A total of 39 laboratories

Appendix table. Laboratory response rates, by type of jurisdiction

Type of jurisdiction	All laboratories		Responding laboratories		Response rate
	Number	Percent	Number	Percent	
All laboratories	351	100%	306	100%	87%
State/regional	203	58%	176	58%	87%
County	65	19	60	20	92
Municipal	50	14	45	15	90
Federal/national	33	9	25	8	76

were removed from the list because callers either determined the facility was not a crime laboratory, was a duplicate listing, or contained faulty contact information.

Following the initial mailing of 430 surveys and a second round, 218 facilities completed the survey. Twelve labs were determined to be ineligible. This resulted in an initial response rate of 52% (218/418).

Following extensive follow-up efforts, it was discovered that the list contained many facilities that did not meet the project definition of a crime laboratory:

A laboratory which employs one or more full time scientists whose principal function is the examination of physical evidence for law enforcement agencies and that provides reports and testimony to courts of law with respect to such evidence.

A number of police agency units on the list investigated crime scenes, searched for and gathered evidence, and took photographs, but did not employ full-time scientists to examine the evidence collected. The list contained names and addresses of police "identification units" that typically investigated crime scenes for fingerprints, and processed and examined those fingerprints, but were not laboratories and did not employ at least one scientist who examined and interpreted the physical evidence.

The population subsequently dropped to 351 eligible laboratories. Completed surveys were obtained from 281 laboratories, for a response rate of 80%. In a final effort to improve response, UIC and BJS developed a reduced length survey instrument that collected basic information about laboratory operations. In conjunction with additional telephone calls and

e-mails, another 25 laboratories responded to the shorter survey, for an overall response rate of 87% (306/351).

The Federal Bureau of Investigation (FBI) laboratory division provided data for 2003. This report presents the FBI data separately.

Among the 45 non-responding laboratories are 27 State or regional labs, 5 county labs, 5 municipal labs, and 8 Federal labs. This results in response rates of 87%, 92%, 90%, and 76%, respectively (appendix table).

Among responding laboratories, missing data imputations were made for personnel, budgets, and evidence processing data.

Missing actual FTE data were imputed by multiplying authorized FTE by the mean percentage of authorized FTEs actually employed among labs of similar type and size. Total FTEs in specific categories of employment were imputed by multiplying total actual FTE by the median percentage of total FTEs employed in specific categories for labs of similar type and size.

Missing annual budget data were imputed as follows: for labs reporting a combined budget figure as part of a laboratory system, the combined budget was split proportionately, based on a given labs' share of total FTE for the laboratory system. For other labs, total FTE was multiplied by the median ratio of expenditures per FTE for similar labs by size and type. If the lab was part of a State system in which other labs reported individual budgets, the median ratio method was used within that system. Among labs serving Federal jurisdictions, the median ratio method was used for labs within the same service.

Missing case processing data (cases received and backlogged) were imputed by multiplying total FTE by the median ratio of cases per FTE for similar labs by size and type.

Labs which did not provide complete request processing data (initial backlog, new requests, and completions) received imputed values within each category of forensic service they perform based on median requests per FTE for similar labs by size. Total FTE was multiplied by the median ratio for labs of similar size for each type of request.

Bureau of Justice Statistics reports and questionnaires are available on the BJS website <<http://www.ojp.usdoj.gov/bjs>>. Files of the original data may be obtained from the BJS/NIJ archive at the University of Michigan: National Archive of Criminal Justice Data (NACJD) <<http://www.icpsr.umich.edu/NACJD/index.html>>.

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

Joseph L. Peterson, Professor and Acting Head of the Department of Criminal Justice, University of Illinois at Chicago (UIC) and Matthew J. Hickman, BJS Statistician, collaborated on this report. Steven K. Smith reviewed the report. Tom Hester edited the report.

The 2002 census was directed by Joseph L. Peterson and Sandra K. Costello, Associate Director of the UIC Center for Research in Law and Justice (CRLJ). CRLJ project staff included Laura Kunard, Andrew Krzak, Cosmina Menghes, and Tiffany Vasquez.

Kevin Lothridge, Fellow of the National Institute of Justice, and representatives of the American Society of Crime Laboratory Directors (ASCLD) served as subject matter experts and consultants to this

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ASCLD representatives included the following: Elizabeth Carpenter, Director of the Portland (OR) State Police Forensic Laboratory; Roger Kahn, Deputy Superintendent of Laboratories of the Ohio Bureau of Criminal Identification and Investigation; Susan Johns, Bureau Chief of the Illinois State Police Division of Forensic Services; David Petersen, Assistant Director of the Minnesota State Forensic Science Laboratory; and the late Jan Bashinski, Chief of the Bureau of Forensic Services (retired), California Department of Justice.

The UIC Survey Research Laboratory (SRL) produced and administered the final census instrument.

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