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Bulletin

Publicly Funded Forensic Crime Laboratories: Quality Assurance Practices, 2014

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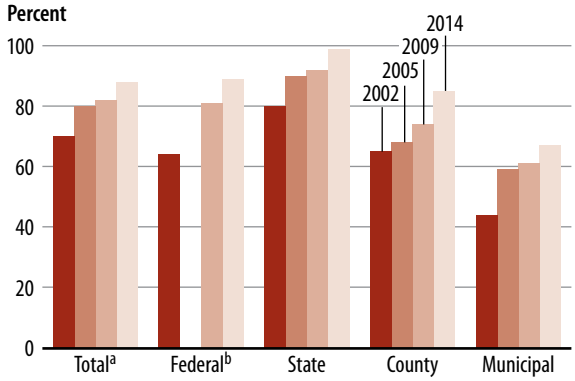
As of December 31, 2014, 88% of the nation's 409 publicly funded forensic crime laboratories were accredited by a professional forensic science organization, compared to 82% in 2009 and 70% in 2002 (figure 1). Similar to previous years, state labs were more likely to be accredited than labs operated by other jurisdictions. Since 2002, the proportion of accredited crime labs increased among all jurisdictions. The most growth occurred among municipal labs, which increased from 44% in 2002 to 67% in 2014.

This report presents data from the Bureau of Justice Statistics' (BJS) 2014 Census of Publicly Funded Forensic Crime Laboratories (CPFFCL) and provides comparisons with data from prior years. The report describes the quality assurance practices of U.S. crime labs, such as accreditation, proficiency testing, written standards for performance expectations, codes of ethics, externally certified personnel, and resources dedicated to research. For information on lab operations, functions, budgets, personnel, workload, and outsourcing, see *Publicly Funded Forensic Crime Laboratories: Resources and Services, 2014* (NCJ 250151, BJS web, November 2016).

FIGURE 1
Percent of publicly funded forensic crime labs accredited by a professional forensic science organization, by type of jurisdiction, 2002, 2005, 2009, and 2014



Note: See appendix table 1 for estimates and standard errors.
[a]Percentage for 2005 includes federal labs.
[b]Percentage not presented for federal labs in 2005 due to low response rate.
Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2005, 2009, and 2014.

HIGHLIGHTS

- In 2014, 88% of the nation's crime labs were accredited by a professional organization, up from 70% in 2002.
- State crime labs were more likely to be accredited than labs operated by other jurisdictions in 2014.
- In 2014, more crime labs held accreditation by the American Society of Crime Lab Directors/ Laboratory Accreditation Board, International (ASCLD/LAB, International) (73%) than any other type of accreditation.
- As in previous years, nearly all (98%) crime labs conducted proficiency testing in 2014.
- Seventy-five percent of crime labs had written standards for employee performance expectations in 2014.
- In 2014, 94% of crime labs maintained a written code of ethics.
- A larger proportion of crime labs employed at least one externally certified analyst in 2014 (72%) than in 2009 (60%).

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Crime labs receive requests from criminal justice agencies to examine and report on physical evidence collected during criminal investigations. In 2014, U.S. crime labs received an estimated 3.8 million requests for forensic services (see *Publicly Funded Forensic Crime Laboratories: Resources and Services, 2014*, NCJ 250151, BJS web, November 2016). Forensic findings and expert opinions are often presented in legal proceedings and play a critical role in the administration of justice. To ensure the accuracy and dependability of their work, crime labs use quality assurance practices. (See *Description of quality assurance practices* text box.)

Nearly all (99%) state crime labs were accredited in 2014

Eighty-eight percent of crime labs were accredited by a professional forensic science organization in 2014 (table 1). During 2014, state crime labs (99%) were more likely than federal (89%), county (85%), and municipal (67%) labs to be accredited by a professional forensic organization.

More than 98% of crime labs employing 25 or more full-time employees were accredited in 2014. In comparison, 90% of crime labs employing between 10 and 24 full-time personnel and 70% of crime labs employing nine or fewer personnel were accredited during the same year.

An estimated 98% of crime labs that performed eight or more forensic functions were accredited in 2014. A larger proportion of single-function (91%) crime labs were accredited than labs performing between two and four forensic functions (81%).

ASCLD/LAB, International was the most common type of accreditation in 2014

Eighty-three percent of crime labs held an international accreditation standard in 2014, with 73% accredited by the American Society of Crime Lab Directors/Laboratory Accreditation Board, International (ASCLD/LAB, International) and 10% accredited by Forensic Quality Services, International (FQS-International).[1] International accreditation programs are based on the International Organization for Standardization (ISO) and have more rigorous requirements than noninternational standards.[2] Both ASCLD/LAB, International and FQS-International require crime labs to comply with the ISO/International Electrotechnical Commission (IEC) 17025 standard, which specifies the requirements for competence to carry out tests and calibrations to produce precise and accurate data.

[1] ANSI-ASQ National Accreditation Board (ANAB) acquired FQS and is in the process of acquiring ASCLD/LAB, International. See http://anab.org/news/latest-news/anab-and-ascldlab-merge-operations/.

[2] ISO develops worldwide standards for a variety of industries to promote quality, safety, and efficiency of products and services. See http://www.iso.org/iso/catalogue_detail.htm?csnumber=39883.

TABLE 1

Percent of publicly funded forensic crime labs with a professional forensic science accreditation, by type of jurisdiction, staff size, and number of forensic functions performed, 2014

	Number of labs	Any accreditation	American Society of Crime Lab Directors/ Laboratory Accreditation Board, Legacy	American Society of Crime Lab Directors/ Laboratory Accreditation Board, International	Forensic Quality Services, International	Other
All labs	409	88%	9%	73%	10%	5%
Type of jurisdiction						
Federal	39	89%	--	65%	9%	22%
State	193	99	8%	90	8	2
County	98	85	10	65	9	7
Municipal	79	67	14	43	15	1
Number of full-time employees*						
100 or more	27	100%	--	77%	31%	12%
50–99	51	100	14%	86	14	--
25–49	90	98	12	83	6	8
10–24	134	90	7	72	11	5
9 or fewer	107	70	8	57	5	2
Number of forensic functions						
8 or more	72	98%	7%	84%	17%	4%
5–7	156	90	12	74	11	2
2–4	132	81	8	64	8	6
1	49	91	4	75	2	14

Note: Detail does not sum to total because a lab could be accredited by more than one organization. The last applications for ASCLD/LAB, Legacy program were accepted on March 31, 2009. Since then, applications for accreditation or re-accreditation must be in the ASCLD/LAB, International program. Due to the 5-year cycle for recertification, all labs were expected to transition from the ASCLD/LAB, Legacy program to ASCLD/LAB, International by 2015. See appendix table 2 for standard errors.

--Less than 0.5%.

*Includes both full-time and part-time employees, with a weight of 0.5 assigned to part-time employees.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

Since 2009, the proportion of crime labs with an ISO-based accreditation standard increased from 27% to 83%.[3] The ASCLD/LAB, International's sunset of the noninternational Legacy Accreditation Program resulted in a significant increase in the proportion of labs with an ISO-based accreditation standard.[4]

[3] See *Census of Publicly Funded Forensic Crime Laboratories, 2009* (NCJ 238252, BJS web, August 2012).

[4] The last applications for ASCLD/LAB, Legacy program were accepted on March 31, 2009. Since then, applications for accreditation or re-accreditation must be in the ASCLD/LAB, International program. Due to the 5-year cycle for recertification, all labs were expected to transition from the ASCLD/LAB, Legacy program to ASCLD/LAB, International by 2015.

In 2014, state crime labs (90%) were more likely than county (65%), federal (65%), and municipal (43%) crime labs to be accredited by an ISO standard through ASCLD/LAB, International. An estimated 15% of municipal crime labs held FQS-International accreditation, compared to 9% of county and 8% of state labs.

A larger proportion of crime labs employing 25 or more full-time employees were accredited by ASCLD/LAB, International than labs with 24 or fewer employees. Labs with 100 or more full-time employees (31%) were most likely to hold FQS-International accreditation. About 75% of single-function crime labs held ASCLD/LAB, International. In comparison, 2% of single-function crime labs were accredited by FQS-International.

Description of quality assurance practices

Quality assurance practices are systems of management procedures that help improve the validity and reliability of findings by establishing standard processes and methods for conducting forensic work. Forensic crime labs develop quality assurance practices and implement them to reduce errors in forensic techniques and analysts' interpretation. These practices also help improve consistency across practitioners. Practices such as obtaining professional accreditation, testing the proficiency of analysts, and external certification of analysts are regarded as benchmarks for measuring compliance to industry-established best practices.

Accreditation is the process in which third-party professional forensic science accreditation bodies assess a crime lab's policies and procedures to evaluate technical competency and ability to generate valid forensic findings and interpret results. The accreditation process includes reviews of the crime lab's management practices, staff competence, training, continuing education, appropriateness of test methods, maintenance of test equipment, testing environment, handling of test items, sampling, documentation, and quality assurance of data. Professional accreditation organizations periodically monitor accredited labs to ensure crime labs maintain the standards required to remain compliant with industry best practices. Although accreditation does not guarantee that a crime lab will not make an error, it does increase confidence in the lab's ability to produce valid results by demonstrating that the lab is complying with standard operating procedures.

Proficiency testing is a quality control tool used to examine the performance of the crime lab personnel and to determine whether personnel are following industry standards. To receive and maintain professional accreditation, a crime lab is required to evaluate the technical competence of analysts, other personnel, and the overall performance of the crime lab through proficiency testing. Proficiency tests are conducted internally or externally using declared tests (an examiner knows the sample to be analyzed is a test sample), random case reanalysis (an examiner's work is randomly selected for reanalysis by another examiner), and blind tests (the examiner or crime lab is not aware of being tested).

Analyst certification is recognition by an external organization that an individual has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to perform duties and produce valid forensic findings. While accreditation is a quality assessment of a crime lab, certification is a quality assessment of an individual. External certification programs may assess analysts though exams, proficiency testing, evaluation of education, training and practical experience, adherence to codes of ethics, and other standards.

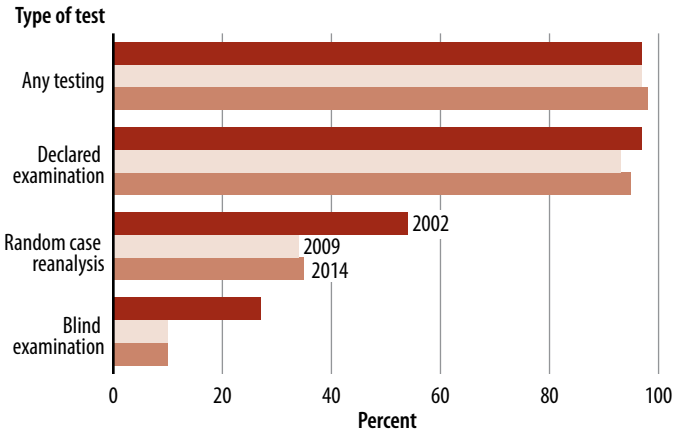
1 in 3 crime labs conducted random case reanalysis in 2014

In 2014, 98% of crime labs conducted proficiency testing, which was similar to 2009 (97%) and 2002 (97%) (figure 2). As in previous years, nearly all (95%) crime labs evaluated the technical competence of employees through declared examinations. The percentage of crime labs that conducted random case reanalysis in 2014 (35%) was similar to that reported in 2009 (34%), but a decrease from 2002 (54%). The proportion of crime labs conducting blind examinations decreased from 27% in 2002 to 10% in both 2009 and 2014.

In 2014, federal crime labs (39%) were more likely than county (8%), state (7%), and municipal (5%) labs to test the proficiency of employees through blind examinations (table 2). In addition, federal crime labs (49%) were also more likely to conduct random case reanalysis than labs operated by other jurisdictions.

FIGURE 2

Percent of publicly funded forensic crime labs that conducted proficiency testing, by type of test, 2002, 2009, and 2014



Note: Detail does not sum to total because a lab could conduct more than one type of proficiency test. In the 2005 census, data were not collected on proficiency tests. Proficiency tests are conducted internally or externally using declared tests (an examiner knows the sample to be analyzed is a test sample), random case reanalysis (an examiner's work is randomly selected for reanalysis by another examiner), and blind tests (the examiner or crime lab is not aware of being tested).See appendix table 3 for estimates and standard errors.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2009, and 2014.

About 1 in 5 (21%) mid-sized crime labs operating with between 25 and 49 full-time employees performed blind proficiency tests. A larger proportion of mid-sized crime labs than labs of other sizes conducted blind proficiency tests. Crime labs with 24 or fewer (5%) full-time employees were less likely than labs with 25 or more full-time employees to conduct blind proficiency tests. A larger proportion of crime labs performing a single forensic function (19%) than labs performing two or more functions conducted blind proficiency tests.

An estimated 61% of crime labs with 100 or more full-time employees performed random case reanalysis tests, compared to less than 30% of crime labs with 24 or fewer full-time employees. An estimated 44% of crime labs performing eight or more forensic functions conducted random case reanalysis tests in 2014, compared to about a third of labs performing between five and seven functions (34%), between two and four functions (32%), and a single function (32%).

TABLE 2

Percent of publicly funded forensic crime labs that conducted proficiency testing, by type of test, jurisdiction, staff size, and number of forensic functions performed, 2014

		Type of proficiency testing	
	Number of labs	Blind	Random case reanalysis
All labs	409	10%	35%
Type of jurisdiction			
Federal	39	39%	49%
State	193	7	35
County	98	8	32
Municipal	79	5	30
Number of full-time employees*			
100 or more	27	11%	61%
50–99	51	13	38
25–49	90	21	45
10–24	134	5	28
9 or fewer	107	4	26
Number of forensic functions			
8 or more	72	11%	44%
5–7	156	8	34
2–4	132	9	32
1	49	19	32

Note: Proficiency tests are conducted internally or externally using random case reanalysis (an examiner's work is randomly selected for reanalysis by another examiner) and blind tests (the examiner or crime lab is not aware of being tested). See appendix table 4 for standard errors.

*Includes both full-time and part-time employees, with a weight of 0.5 assigned to part-time employees.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

Municipal crime labs with written standards for performance increased between 2009 and 2014

In 2014, 75% of crime labs had written standards for performance expectations, up from 72% in 2009 (figure 3). Written standards establish a threshold for employee performance and ensure that performance measures are applied consistently across employees with similar roles.

Federal crime labs (97%) were more likely than state (83%), municipal (75%), and county (51%) labs to have written standards for performance in 2014. Between 2009 and 2014, the most growth in the proportion of labs with written standards for performance expectations occurred in municipal crime labs, increasing from 59% to 75%. The proportion of county crime labs with written standards of performance expectations declined from 59% in 2009 to 51% in 2014.

The majority (94%) of crime labs maintained a written code of ethics in 2014

An estimated 94% of crime labs had a written code of ethics in 2014 (table 3). Labs create or adopt ethical codes to improve the quality of forensic findings. Ethical codes guide behaviors to ensure analysts work within the confines of their expertise, provide objective findings and testimony, avoid conflicts of interest, and avoid susceptibility to outside influences.

State crime labs (98%) were more likely than county (94%), municipal (87%), and federal (85%) crime labs to have a written code of ethics in 2014. The majority (67%) of crime labs adopted one of many existing code of ethics, while 27% of crime labs created and implemented their own written code of ethics.[5] State crime labs (32%) were more likely than county (23%) and federal (14%) crime labs to create their own written code of ethics.

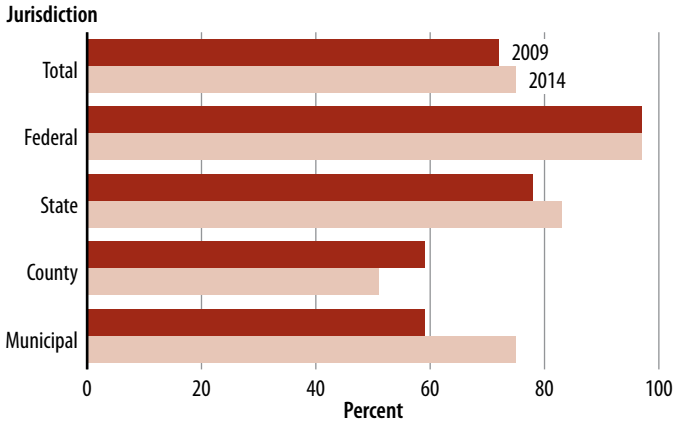
More crime labs employed externally certified analysts in 2014 than in 2009

During 2014, 72% of crime labs employed at least one externally certified analyst (figure 4). The proportion of crime labs employing one or more analysts with external certification increased from 60% in 2009 to 72% in 2014 (up 20%). Seventy-eight percent of municipal crime labs employed one or more externally certified analysts in 2014, compared to 70% of state and 63% of federal crime labs. Between 2009 and 2014, state-operated crime labs experienced the largest increase in the proportion of labs employing one or more externally certified analysts. The decrease from 2009 to 2014 in the proportion of federal crime labs with at least one externally certified analyst was not statistically significant.

[5] See National Academies Press Code of Ethics section at http://www.nap.edu/read/12589/chapter/2?term=code#26.

FIGURE 3

Percent of publicly funded forensic crime labs with written standards for performance expectations, by type of jurisdiction, 2009 and 2014



Note: See appendix table 5 for estimates and standard errors.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2009 and 2014.

TABLE 3

Percent of publicly funded forensic crime labs with written code of ethics, by type of jurisdiction, 2014

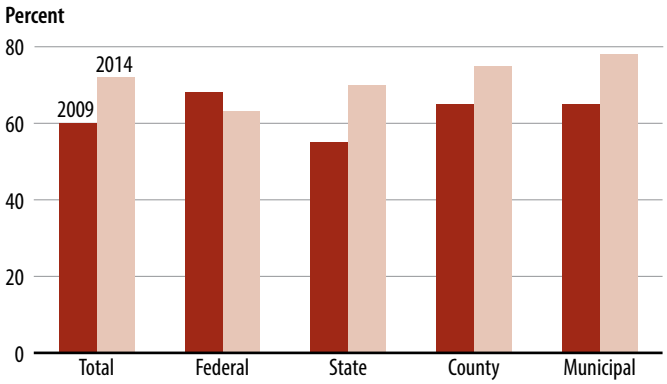
Type of jurisdiction	Total	Created own code	Adopted existing code	Did not have written code
All labs	100%	27%	67%	6%
Federal	100%	14	72	15
State	100%	32	66	2
County	100%	23	71	6
Municipal	100%	27	60	13

Note: See appendix table 6 for standard errors. Details do not sum to total due to rounding.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

FIGURE 4

Percent of publicly funded forensic crime labs with one or more externally certified analysts, 2009 and 2014



Note: See appendix table 7 for estimates and standard errors.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2009 and 2014.

In 2014, about 9 in 10 crime labs with 50 or more full-time personnel employed at least one externally certified analyst (table 4). In comparison, about 45% of labs with nine or fewer full-time employees employed one or more externally certified analysts in 2014. Crime labs that performed eight or more forensic functions (88%) were more likely than crime labs performing fewer functions to employ at least one externally certified analyst. An estimated 24% of crime labs performing a single forensic function employed at least one externally certified analyst in 2014. Crime labs with professional accreditation (74%) were more likely than crime labs without accreditation (57%) to employ at least one externally certified analyst.

More than half (56%) of federal crime labs dedicated resources to research in 2014

An estimated 14% of crime labs devoted staff, time, supplies, or other resources to forensic science research in 2014 (table 5). Forensic science research includes experimentation aimed at the discovery and interpretation of facts, the revision of accepted methods, or practical application of new or revised methods or technologies. The National Institute of Justice (NIJ) provided the most resources dedicated to research. Between 2009 and 2014, NIJ funded nearly $120 million in forensic science research projects.[6] This funding sought to provide new crime-solving techniques and increase the reliability and efficiency of forensic testing.

The proportion of crime labs that dedicated resources to research doubled from 7% in 2009 to 14% in 2014, a proportion similar to 2002 (13%). As in 2009, federal crime labs (56%) were more likely than state (11%), county (11%), and municipal labs (4%) to have resources dedicated to research in 2014. Between 2009 and 2014, federal crime labs had the largest increase in the proportion of crime labs with resources dedicated to research. For all years with available data, larger crime labs were more likely to dedicate resources to research than smaller labs.

[6] See *The Impact of Forensic Science Research and Development*. Washington, D.C.: U.S. Government Printing Office.

TABLE 4

Percent of publicly funded crime labs with one or more externally certified analysts, by staff size, number of forensic functions performed, and accreditation status, 2014

	Number of labs	Percent
All labs	409	72%
Number of full-time employees*		
100 or more	27	92%
50–99	51	92
25–49	90	76
10–24	134	80
9 or fewer	107	45
Number of forensic functions		
8 or more	72	88%
5–7	156	83
2–4	132	69
1	49	24
Accreditation status		
Accredited	362	74%
Not accredited	47	57

Note: See appendix table 8 for standard errors.

*Includes both full-time and part-time employees, with a weight of 0.5 assigned to part-time employees.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

TABLE 5

Percent of publicly funded forensic crime labs with resources dedicated to research, by type of jurisdiction and staff size, 2002, 2009, and 2014

	2002	2009	2014
All labs	13%	7%	14%
Type of jurisdiction			
Federal	51%	30%	56%
State	9	6	11
County	10	5	11
Municipal	8	2	4
Number of full-time employees*			
100 or more	24%	46%	41%
50–99	34	21	29
25–49	13	2	24
10–24	6	4	2
9 or fewer	9	2	7

Note: Data were not collected on research in the 2005 census. See appendix table 9 for standard errors.

*Includes both full-time and part-time employees, with a weight of 0.5 assigned to part-time employees.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2009, and 2014.

Methodology

Overview

The Bureau of Justice Statistics (BJS) periodically conducts the Census of Publicly Funded Forensic Crime Laboratories (CPFFCL) to collect data on crime lab services, budgets, staffing, workload, outsourcing, and quality assurance practices. The data collection is directed to federal, state, county, and municipal crime labs that are funded solely by the government or whose parent organization is a government agency. The CPFFCL includes agencies that employ one or more full-time scientists (1) with a minimum of a bachelor's degree in chemistry, physics, biology, criminalistics, or a closely related forensic science field, and (2) whose principal function is examining physical evidence in criminal matters and providing reports and testimony to courts of law regarding such evidence.

About half of the crime labs included in the CPFFCL were part of a multi-lab system (two or more physically separate facilities that are overseen by a single organization). The CPFFCL attempted to collect information from each lab in multi-lab systems. The CPFFCL did not include operations that engage exclusively in evidence collection and documentation, such as fingerprint recovery and development, crime scene response, and photography. In addition, the census did not collect data on the forensic services performed by police identification units outside of the crime lab and it did not include privately operated crime labs.

Data collection and response rate

BJS conducted its fourth CPFFCL to collect detailed information on the workload and operations of the nation's 409 crime labs during 2014 and to examine changes since the previous censuses conducted in 2002, 2005, and 2009. The CPFFCL population frame and questionnaire were developed by BJS and the Urban Institute with input from the American Society of Crime Laboratory Directors as well as researchers and practitioners in the forensic science field. BJS pretested the CPFFCL questionnaire on a small sample of labs representing facilities of different sizes and governmental affiliations.

In April 2015, the Urban Institute initiated the data collection on behalf of BJS through a web-based data collection interface and mailed questionnaire. Follow-up emails and phone calls were made to nonrespondents and labs that submitted incomplete questionnaires. Of the 409 eligible crime labs that received the questionnaire, 360 (88%) provided responses to at least some of the items (table 6).[7] Of the 360 respondents, 351 (98%) completed the questionnaire through the automated web system. The 2014 CPFFCL response rate ranged from 94% for state labs to 72% for federal labs.

[7]A total of 306 (87%) of the 351 crime labs in 2002 provided responses to the 2002 CPFFCL questionnaire. Of the 389 crime labs in the 2005 CPFFCL, 351 (90%) provided responses to the 2005 questionnaire. Of the 411 crime labs surveyed in the 2009 CPFFCL, 397 (97%) provided responses to that data collection.

TABLE 6
Publicly funded forensic crime laboratories, by type of jurisdiction, 2014

Type of jurisdiction	All labs in CPFFCL	Labs responding to CPFFCL	Response rate
All labs	409	360	88%
Federal	39	28	72
State	193	182	94
County	98	87	89
Municipal	79	63	80

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories (CPFFCL), 2014.

Methods for producing national estimates

To generate national estimates for this report, BJS used imputation methods to account for missing data among labs that did not respond to either the entire CPFFCL questionnaire (unit-level response) or certain questions (item-level response). Because the CPFFCL data collection was a census with no sampling, each crime lab was initially self-representing and had a design weight of 1. BJS developed weighting class adjustments for the 2002, 2005, 2009, and 2014 CPFFCL data to compensate for unit nonresponse and reduce nonresponse bias. Sixteen subpopulations of labs were stratified into groups by crossing four categories of jurisdiction (federal, state, county, and municipal) and four categories of staff size (9 or fewer, 10 to 24, 25 to 49, and 50 or more). A seventeenth stratum was assigned to the FBI crime laboratory, given its unique size of more than 500 employees. Within each of the subgroups, statistical weights were applied to the data from the crime labs that responded to the census to allow their responses to represent the labs that did not respond.

In addition to adjusting for unit nonresponse through the use of weighting class adjustments, BJS also imputed for item nonresponse. BJS measured staff size by full-time equivalent employees and included both full-time and part-time employees with part-time employees weighted by 0.5. For the labs that responded to the CPFFCL but did not report employee data, imputations were made for the count- and percentage-based measures using their employee data reported in the other CPFFCL data collections. If that information was not available, BJS used the median staff size in 2014 among labs of similar jurisdiction. Among the 360 labs that responded to the 2014 CPFFCL, 339 reported their 2014 employee total. For the 22 labs that did not report their 2014 staff total, the previous reported staff total was used. Estimates for the 2002, 2005, and 2009 CPFFCL were generated using similar imputation methods. When employee totals from other CPFFCL data collections were not available to account for item nonresponse, the median staff size of labs of similar jurisdiction was used.

When a respondent was unable to provide some requested items, BJS used sequential hot-deck imputation procedures to impute the missing responses in the 2002, 2005, 2009, and 2014 data. Sequential hot-deck imputation replaces a missing value with a response provided by a crime lab with similar characteristics. BJS grouped both respondents and nonrespondents into the strata described above and then sorted within each stratum by the number of forensic functions each lab performed. Once the list of crime labs were sorted within strata, the respondents provided donor responses for nonrespondents using the nearest neighbor method. This method identifies and replaces a missing value with the response donated from the lab listed immediately prior to the lab with missing data. If the donor listed immediately prior to the lab with missing data also had a missing response, BJS imputed a response from a donor listed immediately after the lab with the missing value. BJS repeated the process of going backwards and forwards to obtain donated responses from neighbors until all missing values were imputed.

Comparability to prior reports

Data on quality assurance practices presented in the 2002, 2005, and 2009 CPFFCL reports were not adjusted for lab nonresponse. Estimates presented in this report may differ from previously presented data because some adjustments for unit or item nonresponse were made. For example, *Census of Publicly Funded Forensic Crime Laboratories, 2009* (NCJ 238252, BJS web, August 2012) reported that 75% of county labs were accredited in 2009. This report indicates that 74% of county labs were accredited in 2009. In the 2009 report, data on accreditation were based on 389 crime labs (or 98% of the 397 labs responding the 2009 census). In this 2014 report, the 2009 data have been adjusted to account for nonresponse crime labs and represent 411 crime labs (or the total number of labs included in the 2009 CPFFCL).

Conducting tests of statistical significance

BJS conducted tests to determine whether differences in the estimates were statistically significant. All differences discussed in this report are statistically significant at or above the 95% confidence interval. Standard errors were generated using SPSS statistical software that estimates variance for complex survey designs. The standard errors for the tables and figures are presented in appendix tables. These standard error estimates may be used to construct confidence intervals around percentages in this report. For example, the 95% confidence interval around the percentage of crime labs accredited in 2014 is 88% ± 1.96 × 0.7% (or approximately 87% to 89%) where 88% is the point estimate in table 1 and 0.7% is the standard error in appendix table 2.

The standard errors may also be used to test the significance of the difference between two statistics by pooling the standard errors of the two estimates. For example, the standard error of the difference between state and federal crime labs accredited in 2014 would be 2.9% (or the square root of the sum of the squared standard errors for each group). The 95% confidence interval around the difference would be 1.96 × 2.92% (or 5.72%). Because the observed difference of 10% (99% minus 89%) is greater than 5.72%, the difference would be considered statistically significant.

APPENDIX TABLE 1

Estimates and standard errors for figure 1: Percent of publicly funded forensic crime labs accredited by a professional forensic science organization, by type of jurisdiction, 2002, 2005, 2009, and 2014

	Estimates					Standard errors				
Year	Total	Federal	State	County	Municipal	Total	Federal	State	County	Municipal
2002	70%	64%	80%	65%	44%	0.9%	5.3%	1.1%	1.7%	1.8%
2005	80	^	90	68	59	0.7	^	0.2	1.1	2.3
2009	82	81	92	74	61	0.3	1.1	0.3	0.7	1.4
2014	88	89	99	85	67	0.7	2.9	0.3	1.2	2.8

^Too few cases to provide a reliable rate.

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2005, 2009, and 2014.

APPENDIX TABLE 2

Standard errors for table 1: Percent of publicly funded forensic crime labs with a professional forensic science accreditation, by type of jurisdiction, staff size, and number of forensic functions performed, 2014

	Any accreditation	American Society of Crime Lab Directors/ Laboratory Accreditation Board, Legacy	American Society of Crime Lab Directors/ Laboratory Accreditation Board, International	Forensic Quality Services, International	Other
All labs	0.7%	0.5%	0.9%	0.6%	0.4%
Type of jurisdiction					
Federal	2.9%	0.0%	4.6%	3.3%	3.1%
State	0.3	0.5	0.6	0.4	0.2
County	1.2	0.9	1.7	1.2	1.1
Municipal	2.8	1.9	2.9	2.0	0.4
Number of full-time employees					
100 or more	0.0%	0.0%	3.6%	3.4%	1.4%
50–99	0.0	0.9	0.9	2.1	0.0
25–49	0.0	0.8	1.3	0.6	1.3
10–24	1.5	1.0	1.8	1.3	0.8
9 or fewer	1.9	1.2	1.8	1.0	0.4
Number of forensic functions					
8 or more	0.4%	0.6%	1.6%	1.8%	0.5%
5–7	1.2	0.8	1.4	1.0	0.5
2–4	1.7	1.1	1.9	1.1	1.0
1	1.1	0.9	1.7	0.5	1.3

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

APPENDIX TABLE 3

Estimates and standard errors for figure 2: Percent of publicly funded forensic crime labs that conducted proficiency testing, by type of test, 2002, 2009, and 2014

	Estimates			Standard errors		
Type of test	2002	2009	2014	2002	2009	2014
Any test	97%	97%	98%	0.4%	0.2%	0.3%
Declared examination	97	93	95	0.4	0.2	0.4
Random case reanalysis	54	34	35	1.0	0.4	0.8
Blind examination	27	10	10	0.9	0.3	0.5

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2009, and 2014.

APPENDIX TABLE 4

Standard errors for table 2: Percent of publicly funded forensic crime labs that conducted proficiency testing, by type of test, jurisdiction, staff size, and number of forensic functions performed, 2014

	Type of proficiency testing	
	Blind	Random reanalysis
All labs	0.5%	0.8%
Type of jurisdiction		
Federal	3.5%	0.8%
State	0.4	1.8
County	1.0	2.6
Municipal	1.5	3.8
Number of full-time employees		
100 or more	1.0%	2.5%
50–99	2.0	2.2
25–49	1.2	1.4
10–24	0.9	1.6
9 or fewer	0.9	1.7
Number of forensic functions		
8 or more	1.5%	1.9%
5–7	0.8	1.3
2–4	1.2	1.8
1	2.2	2.4

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

APPENDIX TABLE 5

Estimates and standard errors for figure 3: Percent of publicly funded forensic crime labs with written standards for performance expectations, by type of jurisdiction, 2009 and 2014

	Estimates		Standard errors	
Type of jurisdiction	2009	2014	2009	2014
All labs	72%	75%	0.4%	0.8%
Federal	97	97	0.8	1.0
State	78	83	0.5	0.7
County	59	51	0.8	1.9
Municipal	59	75	1.4	2.7

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2009 and 2014.

APPENDIX TABLE 6

Standard errors for table 3: Percent of publicly funded forensic crime labs with written code of ethics, by type of jurisdiction, 2014

Type of jurisdiction	Created own code	Adopted existing code	Did not have written code
All labs	0.8%	0.9%	0.5%
Federal	3.5	3.5	1.3
State	0.8	0.9	0.3
County	1.6	1.7	0.9
Municipal	2.8	3.0	2.0

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

APPENDIX TABLE 7

Estimates and standard errors for figure 4: Percent of publicly funded forensic crime labs with one or more externally certified analysts, 2009 and 2014

	Estimates		Standard errors	
Type of jurisdiction	2009	2014	2009	2014
All	60%	72%	0.4%	0.8%
Federal	68	63	1.9	4.4
State	55	70	0.5	0.8
County	65	75	0.8	1.7
Municipal	65	78	1.2	2.1

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2009 and 2014.

APPENDIX TABLE 8

Standard errors for table 4: Percent of publicly funded crime labs with one or more externally certified analysts, by staff size, number of forensic functions performed, and accreditation status, 2014

	Percent
All labs	0.8%
Number of full-time employees	
100 or more	1.4%
50–99	0.7
25–49	1.6
10–24	1.3
9 or fewer	2.1
Number of forensic functions	
8 or more	1.2%
5–7	1.1
2–4	1.7
1	1.8
Accreditation status	
Accredited	0.8%
Not accredited	3.8

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2014.

APPENDIX TABLE 9

Standard errors for table 5: Percent of publicly funded forensic crime labs with resources dedicated to research, by type of jurisdiction and staff size, 2002, 2009, and 2014

	2002	2009	2014
All labs	0.7%	0.2%	0.5%
Type of jurisdiction			
Federal	5.5%	1.7%	4.6%
State	0.7	0.3	0.5
County	1.1	0.3	0.8
Municipal	0.0	0.0	0.5
Number of full-time employees			
100 or more	2.9%	1.9%	2.9%
50–99	2.0	1.2	2.4
25–49	1.3	0.4	1.4
10–24	1.4	0.3	0.2
9 or fewer	1.0	0.1	1.2

Source: Bureau of Justice Statistics, Census of Publicly Funded Forensic Crime Laboratories, 2002, 2009, and 2014.

The Bureau of Justice Statistics of the U.S. Department of Justice is the principal federal agency responsible for measuring crime, criminal victimization, criminal offenders, victims of crime, correlates of crime, and the operation of criminal and civil justice systems at the federal, state, tribal, and local levels. BJS collects, analyzes, and disseminates reliable and valid statistics on crime and justice systems in the United States, supports improvements to state and local criminal justice information systems, and participates with national and international organizations to develop and recommend national standards for justice statistics. Jeri M. Mulrow is acting director.

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