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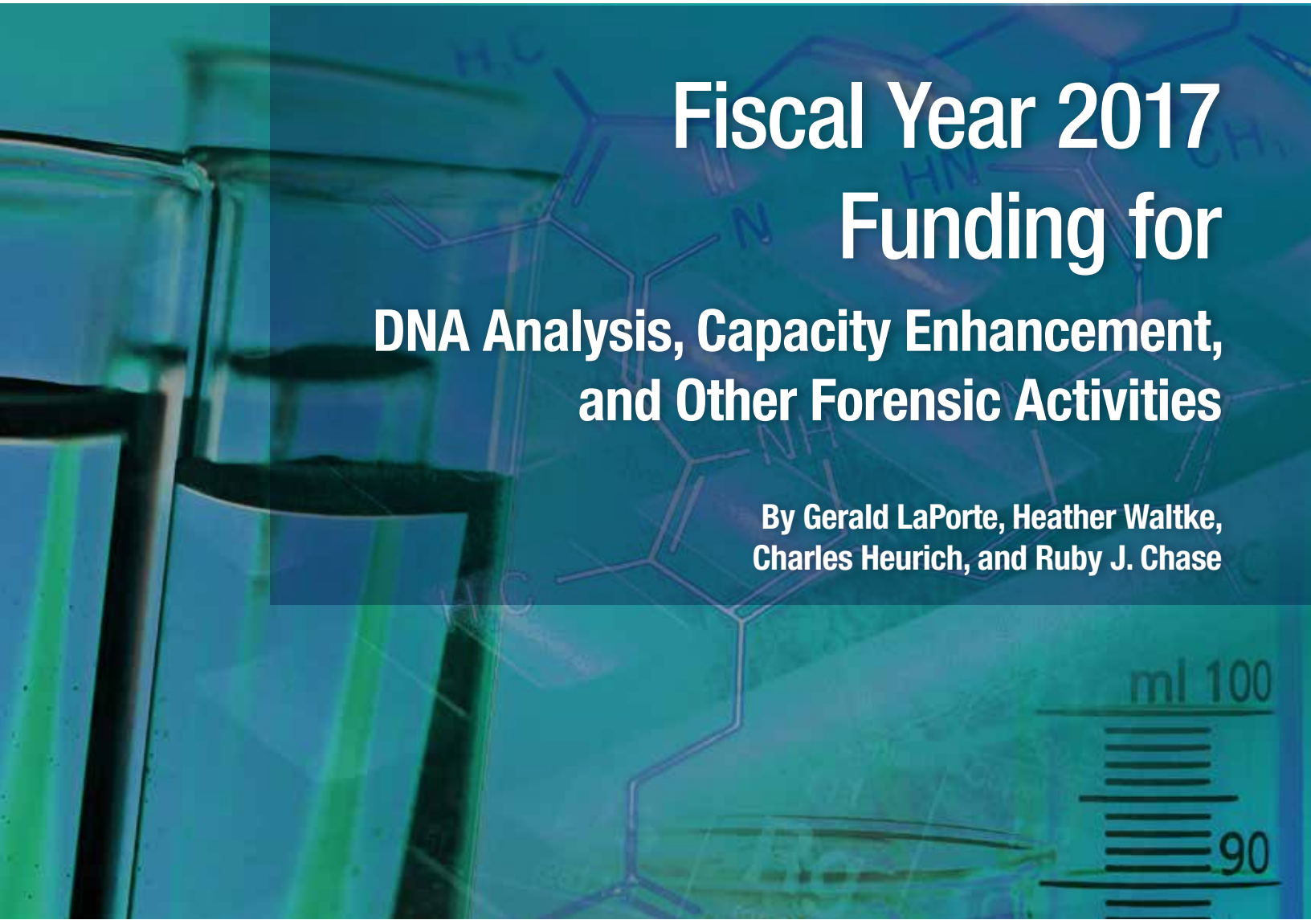
REPORT
FORENSIC SCIENCE



Fiscal Year 2017 Funding for DNA Analysis, Capacity Enhancement, and Other Forensic Activities

By Gerald LaPorte, Heather Waltke, Charles Heurich, and Ruby J. Chase

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Office of Justice Programs

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FISCAL YEAR 2017 FUNDING FOR DNA ANALYSIS, CAPACITY ENHANCEMENT, AND OTHER FORENSIC ACTIVITIES

BY GERALD LAPORTE, HEATHER WALTKE, CHARLES HEURICH, AND RUBY J. CHASE

Overview

The National Institute of Justice (NIJ) — the research, development, and evaluation arm of the U.S. Department of Justice (DOJ) — is the only federal agency supporting forensic science programs dedicated to research, development, and evaluation in conjunction with capacity building, technical assistance, and extramural projects. While the forensic science community ultimately requires long-term national strategies and programs to fully address its needs, there are also immediate needs that must be addressed. These immediate needs arise primarily from state and local forensic laboratories, which face the dual challenges of satisfying the increasing demand for forensic testing while keeping up with the latest advances. In 2011, NIJ established the Office of Investigative and Forensic Sciences (OIFS) as part of its overall strategic plan to support forensic science in the United States.

In 2017, through the Department of Justice Appropriations Act, NIJ received $125 million for the following purpose areas: (a) DNA-related and forensic programs and activities, of which $117 million is for a DNA analysis and capacity enhancement program and for other federal, state, and local forensic activities to address the nation's forensic DNA backlog crisis; (b) $4 million for the purposes described in the Kirk Bloodsworth Post-Conviction DNA Testing Program[1] and (c) $4 million for Sexual Assault Forensic Exam Program grants.[2]

> The programs described in this report are overseen and directed by NIJ's Office of Investigative and Forensic Sciences (OIFS), the federal government's lead office for forensic science research and development and administration of capacity enhancement and technical assistance programs.
>
> OIFS is composed of a team of scientists and has three primary categories of activities: (1) research and development, (2) capacity enhancement, and (3) technical assistance and knowledge transition.

It is important to note that each of these amounts was subject to various mandatory assessments, including 7 percent for Tribal Assessment,[3] 8 percent for Management and Administrative Expenses, and 2 percent for Research and Evaluation activities. As a result, NIJ

received $97,398,644 ($97.4 million) of the $117.0 million to carry out DNA and other forensic program activities. Although NIJ supplements its various forensic activities with other sources — such as funds transferred from federal partners, and funds set aside by the NIJ Director for research, development, and evaluation projects — these amounts vary each year depending on availability. Each year, NIJ considers how to allocate the available funding to support various programs based on factors such as the amount of unspent money remaining in forensic DNA laboratories from previous grant awards; recommendations regarding research and development from NIJ's Forensic Sciences Technology Working Group;[4] and results from studies and new findings. Therefore, the purpose of this report is to show how NIJ invested the $97.4 million in DNA and other forensic activities, and the positive impact these efforts have had on the criminal justice system.

Office of Investigative and Forensic Sciences
Mission: To advance forensic science through research, resources, and innovation to protect the public and ensure justice for all.

NIJ remains committed to a sustained national effort that recognizes research and development as a long-term solution while providing support to forensic laboratories to address the immediate concerns of DNA capacity enhancement and efficiency improvement. These efforts are instrumental in furthering the initiatives of the Attorney General and DOJ to make available "prompt and accurate forensic science analysis to our law enforcement and prosecutors."[5] This statement solidifies NIJ's programmatic goals and objectives as a mechanism for continuing "integrity in law enforcement, reducing crime, and increasing public safety."[6]

The Fiscal Year 2017 Forensic Science Programs

Of the $97.4 million made available to NIJ in FY 2017 for DNA-related and forensic programs and activities, funding can be generally broken down into three broad categories related to NIJ's strategic approach to supporting the forensic community in addition to activities related to dissemination, outreach, and scientific support[7] (see Table 1).

The distribution of funds awarded through NIJ's forensic programs in FY 2017 is shown in Table 1. Seventy percent of the funding went directly to forensic science laboratories and law enforcement agencies to process, record, screen, and analyze forensic DNA and/or DNA database samples; increase the capacity of forensic laboratories; and reduce the backlog of samples awaiting DNA analysis. Sixteen percent was dedicated to projects that include the development of highly discriminating, accurate, reliable, cost-effective, and rapid methods for the identification, analysis, and interpretation of physical evidence. Ten percent of the funding was allocated to technical assistance to enhance the use of DNA and other forensic sciences in the criminal justice system. Four percent went toward scientific support, dissemination, and outreach.

Direct Funding for State and Local Forensic Laboratories

NIJ supports the direct funding of state and local forensic laboratories with three important programs: (1) the DNA Capacity Enhancement and Backlog Reduction (DNA CEBR) program; (2) the DNA Laboratory Efficiency Improvement and Capacity Enhancement (DNA EI&CE) program; and (3) the Sexual Assault Forensic Evidence — Inventory, Tracking, and Reporting (SAFE-ITR) program. All programs have the overarching purpose of assisting recipients with increasing the capacity to perform forensic testing and increasing the quality of the forensic results in their laboratories as well as ensuring accountability and transparency. These programs further the Department's priorities to reduce violent crime, to support prosecutors in their efforts to meet their mission, and to create safer communities.

DNA Capacity Enhancement and Backlog Reduction (DNA CEBR) Program

Grants are issued to the nation's forensic DNA laboratories through the DNA CEBR program using a formula derived from the number of violent crimes, property crimes, and the population of the agency's jurisdiction. The main objectives of the program are to

Table 1: Categories of Support for NIJ's Forensic Programs in FY 2017

Category/Program	DNA Related and Other Forensics Funding Source	Other Funding Sources[8]	Total Funding for the Program	Number of Awards
Direct Funding for State and Local Forensic Laboratories (70%)	**$67.9M***	**$1.8M**	**$69.7M***	**158**
DNA Capacity Enhancement and Backlog Reduction (CEBR) Program	$61.1M		**$61.1M**	131
DNA Laboratory Efficiency Improvement and Capacity Enhancement (EI&CE) Program	$6.6M		**$6.6M**	20
Sexual Assault Forensic Evidence — Inventory, Tracking, and Reporting (SAFE-ITR) Program	$0.1M	$1.8M	**$1.9M**	7
Research, Development, Testing, and Evaluation (16%)	**$16.6M**	**$11.3M**	**$27.9M**	**56**
Research and Development in Forensic Science for Criminal Justice Purposes	$14.4M	$11.3M	**$25.7M**	52
Research and Evaluation on Drugs and Crime	$1.5M		**$1.5M**	2
Reimbursable Interagency Agreements (IAAs) With Federal Partners	$0.7M		**$0.7M**	2
Technical Assistance for Forensic Laboratories and Law Enforcement Agencies (10%)	**$9.7M**	**$3.4M**	**$13.1M**	**16**
National Missing and Unidentified Persons System (NamUs)	$4.1M	$3.4M	**$7.5M**	1
Forensic Technology Center of Excellence (FTCoE)	$3.3M		**$3.3M**	1
Strengthening the Medical Examiner-Coroner System Program	$2.3M		**$2.3M**	14
Contracts for Scientific Support, Dissemination, and Outreach (4%)	**$3.0M**		**$3.0M**	
Printing and distributing forensic reports and handbooks; supporting the National Criminal Justice Reference Service (NCJRS); hosting and maintaining websites; providing assistance to ensure grantee compliance with the National Environmental Policy Act (NEPA); and contracts for scientific support staff at NIJ and the Performance Measure Tool (PMT) to collect performance measures.	$3.0M			
Grand Total	**$97.4M***	**$16.4M***	**$113.6M***	**230**

*Values may not add up due to rounding in the amounts listed for each program.

improve the quality of testing and increase the efficiency of evidence processing in forensic DNA laboratories. Improvements in quality and throughput are achieved through innovations such as more sensitive chemistries, faster technologies, and streamlined workflows. Grant recipients use their own discretion to spend the funding for capacity-building purposes, for the direct analysis of DNA evidence from all types of casework (including sexual assault evidence, database samples from convicted offenders and, in applicable jurisdictions, arrestees), or any combination of the two, based on the recipient's specific needs.

NIJ's efforts to reduce backlogs of biological evidence in laboratories across the country have resulted in significant improvements in the quantity and quality of

PERFORMANCE DATA FROM CEBR GRANTEES

Since FY 2005:

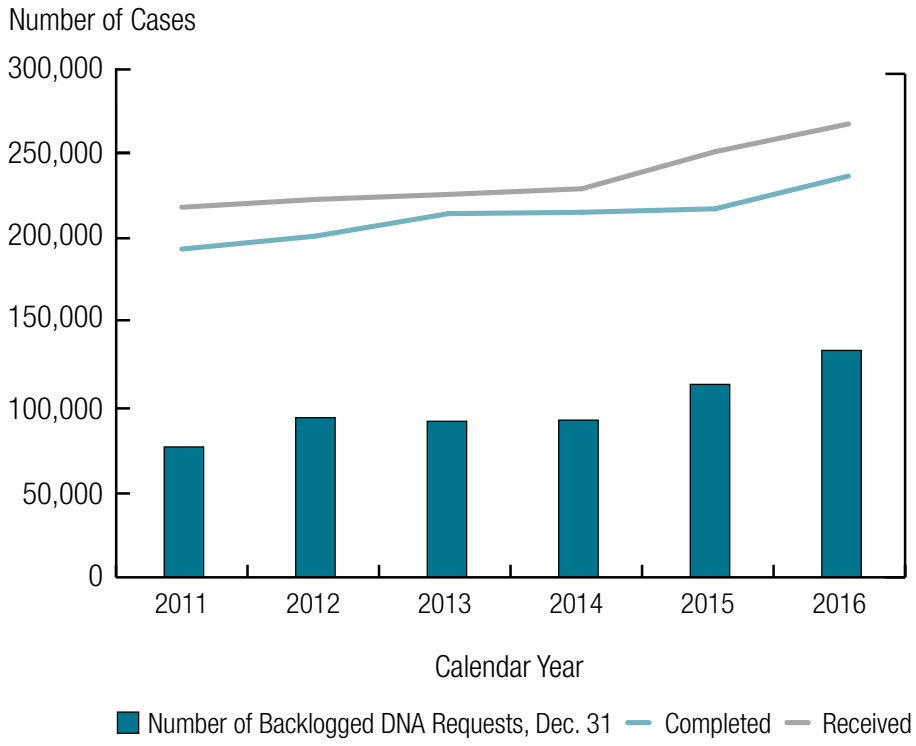
- Over 860,000 cases completed.
- Over 376,000 forensic (crime scene) profiles uploaded to CODIS.
- Over 2.95 million database samples completed.
- Over 2.93 million database profiles uploaded to CODIS.
- Over 192,000 CODIS hits.

DNA testing, but a reduction in the backlog has been tempered by a substantial increase in the demand for testing. The increased demand is due in part to NIJ-supported improvements to DNA evidence analysis: As the technology becomes more helpful to law enforcement, the demand for DNA testing continues to increase.

Preliminary results from the FORESIGHT project[9] — an NIJ-supported, business-guided self-evaluation for forensic science laboratories — show that for every 1-percent improvement in a laboratory's time to process the evidence, there is a subsequent 1.1-percent increase in the demand for analysis. In addition to the mounting requests for DNA testing, laboratories are being inundated with other forensic requests that ultimately slow down processing time.

An examination of the performance data collected from grant recipients shows that NIJ funding has had a positive impact on increasing throughput and capacity. DNA evidence backlogs arise from insufficient supply[10] coupled with an overflowing demand.[11] Figure 1 shows the gap between demand and supply in national laboratories. Although the demand is still outpacing the supply in national laboratories, over the last six years the gap has been closing. From 2011 to 2016, requests increased by 21.9 percent, but the number of cases completed rose by 21.6 percent. This trend was confirmed by the *Publicly Funded Forensic Crime Laboratories: Resources and Services, 2014* report from the Bureau of Justice

Figure 1: Trends in DNA Testing of Forensic Cases

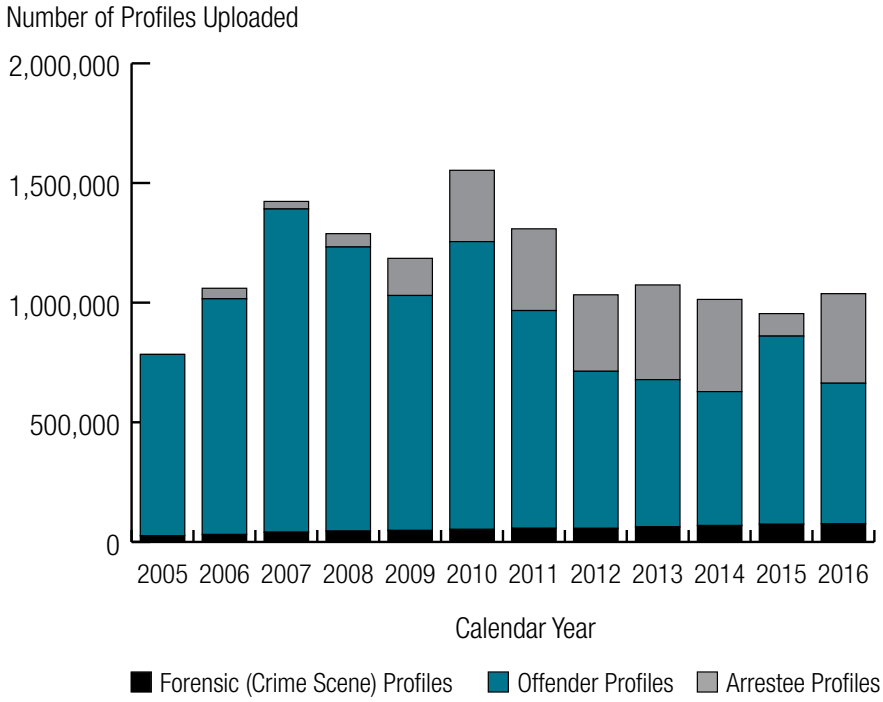


Statistics (BJS): The report showed that, between 2009 and 2014, requests for DNA testing increased 28 percent while tests completed increased 24 percent.[12,13]

The practical impact of funds can be measured by the number of DNA profiles obtained from forensic casework evidence and from convicted offender and arrestee samples uploaded to the FBI's National DNA Index System (NDIS). As DNA technology has advanced and improved, there has been a change in how cases are investigated and how forensic evidence is interpreted, owing to the positive impacts of testing DNA evidence. Advanced technologies in forensic DNA analysis generated from research and development have repeatedly shown the value in testing ***all*** types of evidence from violent crimes, property crimes, unsolved homicides and sexual assaults, potential erroneous convictions, and unidentified human remains. NIJ's research and development efforts have made considerable contributions to the technological advancements adopted by labs in the past few years. For example, more sensitive technologies have allowed a greater number of full DNA profiles to be developed and entered into the FBI's Combined DNA Index System (CODIS) from old, degraded, or otherwise unviable samples — samples that previously yielded a partial profile or no profile at all. This has led to more and more forensic cases being submitted for analysis, and uploads to CODIS have increased more than 190 percent.[14] Increases in CODIS uploads lead to faster identification of violent offenders, many of them repeat property and non-violent crime offenders, thus furthering the mission of the Department to reduce violent crime and increase support for prosecutors. Figure 2 shows the number of profiles uploaded to NDIS for years 2005 through 2016. Forensic profile uploads (samples from crime scenes and other evidence) have been increasing every year.

The size of the national database is an important measure, as the likelihood of identifying a suspect increases with every profile uploaded. Using these metrics, it becomes clear that efforts supported by NIJ are having a sizeable impact. NIJ has played a significant role in achieving the gains demonstrated in this section, but more is needed. Until laboratory capacity outpaces

Figure 2: Number of Profiles Uploaded to NDIS per Calendar Year



the demand for DNA analysis, backlogs will continue to persist. Increased capacity can be achieved many ways, but the CEBR program is only part of the solution. Maintaining investments in research, technology, and innovative solutions is critical to continuing this upward trend for capacity and efficiency.

In FY 2017, NIJ made 131 awards totaling $61.1 million.

- The FY 2017 solicitation for *DNA Capacity Enhancement and Backlog Reduction* (CEBR) program can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-11582.pdf (PDF, 40 pages).
- Information about DNA backlogs, including a list of all awards made under this program, can be found at https://www.NIJ.gov/topics/forensics/lab-operations/evidence-backlogs/pages/backlog-reduction-program.aspx.

DNA Efficiency Improvement and Capacity Enhancement Program (DNA EI&CE)

New in 2017, the central goal of the DNA EI&CE competitive project-based program is to assist eligible crime laboratories in substantially increasing laboratory capacity through a well-defined project and strategy. The DNA EI&CE program was also developed to help prevent backlogs of DNA samples that are associated with other types of forensic evidence. The program is complementary to the DNA CEBR program and allows recipients to fund projects that address specific "stress points" in processing evidence and then informing the forensic science community. Most importantly, grants awarded through this program are used to supplement those laboratories that have identified specific bottlenecks that have not or cannot be addressed through their DNA CEBR grant.

Projects aligned with one of four purpose areas:

1. Multidisciplinary analysis of evidence.
2. Building and improving laboratory infrastructure.
3. Implementation and validation of process efficiency projects.
4. Special projects.

In FY 2017, NIJ made 20 awards totaling $6.6 million: one award was funded under Purpose Area 1, four under Purpose Area 2, six under Purpose Area 3, and nine under Purpose Area 4.

- The FY 2017 solicitation for DNA Laboratory Efficiency Improvement and Capacity Enhancement program can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-11581.pdf (PDF, 44 pages).
- Information about DNA EI&CE, including a list of all awards made under this program, can be found at https://www.NIJ.gov/topics/forensics/lab-operations/evidence-backlogs/Pages/forensic-dna-laboratory-efficiency-improvement-capacity-enhancement-program.aspx.

Sexual Assault Forensic Evidence — Inventory, Tracking, and Reporting (SAFE-ITR) Program

SAFE-ITR was first offered in FY 2016 and created to support the SAFER Act of 2013.[15] The program assists law enforcement agencies in the inventory, tracking, and reporting of all untested and unsubmitted sexual assault kits (SAKs), encouraging accountability and transparency for the collection, processing, and testing of SAKs. The program aligns with DOJ's mission to combat violent crime and improve responses and services to America's crime victims. NIJ requires all award recipients to use their own websites to publicly report information such as the cumulative number of SAKs in their possession, the number of SAKs they have determined will not undergo testing, the number of SAKs that have been submitted to

Sexual Assault Evidence

Evidence from sexual assaults is not limited to a sexual assault kit (SAK). Evidence such as weapons, bedding, clothing, and toxicology samples can be used to corroborate that a crime occurred, identify or eliminate a possible perpetrator, and ascertain through a CODIS search whether a suspect may have been involved in other crimes.

the laboratory, and the number of SAKs that have already been tested. Having this information publicly available will help to ensure accountability and transparency for the processing of SAKs. While all evidence related to sexual assaults is important, this program focuses specifically on the SAKs, which may be stored in many different places, including crime laboratories, police department evidence storage units, hospitals, and clinics.

In August 2017, NIJ published its *National Best Practices for Sexual Assault Kits: A Multidisciplinary Approach,*[16] a comprehensive report that provides 35 recommendations focused on responding to sexual assault cases and better supporting victims throughout the criminal justice process. Part of any successful strategy to deal with sexual assault response is the creation and implementation of an effective strategy to inventory, track, and report SAKs. The program complements the Bureau of Justice Assistance's (BJA's) *Sexual Assault Kit Initiative (SAKI),* which supports a multidisciplinary approach to the issue of unsubmitted SAKs.[17]

In 2017, NIJ made seven awards totaling almost $1.9 million under this program, which includes $1.8 million from the Bureau of Justice Assistance (BJA).

- The FY 2017 Solicitation for the SAFE-ITR program can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-11605.pdf (PDF, 38 pages).

Research, Development, Testing, and Evaluation

NIJ's forensic science research, development, testing, and evaluation program includes the Research and Development (R&D) in Forensic Science for Criminal Justice Purposes program, Research and Evaluation on Drugs and Crime, and agreements with federal partners.

Research and Development in Forensic Science for Criminal Justice Purposes Program

NIJ's Forensic Science R&D program yields benefits beyond advancing knowledge and technology. Through its funding of forensic science research and development, NIJ continues to advance the speed, accuracy, and scope of forensic analysis, which ultimately bolsters the administration of justice. NIJ affirms that scientific advancements and technological breakthroughs are essential to the continued growth and strengthening of the forensic sciences. The program helps DOJ in its priorities to assist law enforcement in solving more crimes as well as support prosecutors in their efforts to meet their mission. R&D can lead to faster or more discriminatory tools and methods to better identify, capture, charge, and sentence true perpetrators of crimes, which minimizes opportunities to commit new crimes, thereby increasing public safety and ensuring the innocent are not wrongly convicted.

The R&D program builds and maintains the forensic science research infrastructure. The National Research Council, in its 2010[18] and 2015[19] reports on the National Institute of Justice, cited building a research infrastructure as central to the mission of NIJ. The R&D program enhances the development of (1) physical capital by supporting the acquisition, maintenance, and development of laboratory instrumentation; (2) intellectual capital by supporting researchers and providing learning and training experiences for scientists at all career stages; and (3) structural capital by funding projects that support databases and add to the scientific literature.

Since 2009, NIJ has supported more than 430 research and development awards related to forensic science, totaling over $206.0 million. In FY 2017, NIJ made 52 awards totaling $25.7 million,[20] many of which include projects that respond directly to the operational needs[21] of forensic biology and DNA laboratories, supporting (1) innovative research focused on improving methods for human identification, (2) novel techniques to detect and isolate sperm-specific DNA from mixtures commonly found in sexual assault evidence, and (3) improvements in data interpretation. These R&D investments will produce new knowledge that will move the field toward solutions to current challenges.

Over $2.6 million of FY 2017 R&D funds support projects focused on improving the analysis of sexual assault evidence, including research related to the development of a method to detect and confirm a victim's exposure to drugs typically used in drug-facilitated crimes such as sexual assault, long after the assault has occurred.

Other FY 2017 R&D investments focus on the operational needs of forensic scientists working in forensic anthropology, pathology, medicolegal death investigation, impression and pattern evidence, trace evidence, forensic toxicology, and controlled substances. While improvements to all forensic science methods through R&D have the potential to increase public safety, some projects specifically promote officer safety. Almost $3 million was dedicated to R&D projects related to forensic toxicology and controlled substances, and although none of these projects were supported under the FY 2017 appropriation for DNA and other forensics, the R&D investments made in these areas are notable for their value in promoting public and officer safety. Projects focused on improving the understanding, characterization, identification, and classification of drugs provide the foundation for better control of their use and an understanding of potential dangers in our communities. Further, the development of portable and non-contact methods for their detection can minimize unnecessary exposure to controlled substances, protecting law enforcement officers from harm.

Several FY 2017 R&D projects continue past efforts and initiatives, some moving a specific technology closer to implementation and others building on already implemented efforts. For instance, NIJ's past investments in R&D have identified and characterized new genetic markers that have been adopted in commercial kits used for DNA sequence analysis. DNA sequence analysis methods have the potential to provide more discriminatory information, mitigate some of the current challenges with complex mixtures, and perhaps even provide phenotype information, such as eye and skin color. FY 2017 projects continue to evaluate massively parallel sequencing (also known as MPS, or next generation sequencing, NGS) platforms and develop software and knowledge needed to interpret the data produced by these sequencing methods. The forensic science laboratory community is also evaluating MPS methods and, if they are adopted, many years of NIJ investment will result in a more informative analysis method to replace or complement the size-based fragment analysis methods that have been used for the past two decades. While this change would be a significant success for the R&D program, NIJ continues to invest in new R&D that would make sequence-based analysis methods more discriminatory and could resolve new technical challenges.

Similarly, NIJ has contributed to R&D efforts that have led to the development of commercially available "rapid DNA" instruments that will be at the forefront of the adoption in the recent Rapid DNA Act legislation.[22] While the implementation of modern rapid DNA instruments is focused on how arrestee samples are processed, this is only one small step towards the ability to use portable devices for forensic applications. NIJ continues to invest in the development of rapid technologies with an eye toward future applications to casework.

Overall, the forensic science R&D program outcomes result in tools and methods with increased sensitivity and specificity, and reduced processing times, thus improving the ability to identify, capture, charge, and sentence perpetrators of crimes. The collection and examination of forensic evidence has been shown to have an impact on case-processing outcomes. Specifically, the collection of crime scene evidence is predictive of arrest, and the examination of evidence is predictive of referral for charges as well as charges being filed, conviction at trial, and sentence length.[23]

In FY 2017, a combination of $14.4 million from the DNA-related and other forensic science activities appropriation and $11.3 million from other sources within NIJ funded 52 R&D projects — investments today that will yield technological innovations in the future of forensic science to bolster the administration of justice. In April 2015, NIJ published *The Impact of Forensic Science Research and Development,*[24] which highlights some of the recent successes of the program.

- The FY 2017 solicitation for *Research and Development in Forensic Science for Criminal Justice Purposes* can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-11080.pdf (PDF, 47 pages).
- Information about forensic science research and development, including a list of all awards made under this program, can be found at https://www.NIJ.gov/topics/forensics/Pages/research-development-projects.aspx.

Research and Evaluation on Drugs and Crime

The use of heroin and other illegal opioids has increased dramatically across the United States and among different age groups, leading to more drug poisonings, overdoses, and drug-related crime. The opioid drug market is supplied with heroin, fentanyl, other pharmaceuticals diverted for nonmedical use, and novel psychoactive substances that are chemically engineered compounds that can be rapidly developed to produce high-potency analogues. Consistent with DOJ's priority to combat the opioid epidemic, the FY 2017 solicitation for Research and Evaluation on Drugs and Crime identified two drug priorities: heroin and other opioids (including diverted prescription drugs), and novel psychoactive substances (also known collectively as synthetic drugs). This solicitation sought proposals to conduct applied research that examines criminal justice tools, protocols, and policies concerning drug trafficking, markets, and use that are applicable to state, local, and tribal jurisdictions. NIJ funded two projects under this solicitation. One project is an evaluation of a "Heroin-Involved Drug Investigation protocol" that guides medical examiners and law enforcement in evidence collection and preservation to improve manslaughter prosecutions of drug dealers. The second project is a data-mining effort that will examine archived toxicology results from suspected drug-related death and drug-impaired driving cases originating from 40 states since January 2016, producing time-course trend reports and geographic distribution heat maps that detect emerging opioids and other drug combinations.

In FY 2017, NIJ funded two awards totaling $1.5 million.

- The solicitation, *Research and Evaluation on Drugs and Crime FY 2017,* can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-12043.pdf (PDF, 41 pages).
- Information about NIJ's drugs and crime research, including a list of all awards made under this program, can be found at https://www.NIJ.gov/topics/drugs/Pages/welcome.aspx.

Federal Partnerships

NIJ identified federal partners to leverage the existing resources of each agency that will benefit state and local forensic laboratories and law enforcement agencies. Currently, NIJ has active agreements with several federal partners, including the FBI, the National Institute for Standards and Technology (NIST), the Defense Forensic Science Center (DFSC), the Armed Forces DNA Identification Laboratory (AFDIL), the Department of Energy (DOE), and the National Science Foundation (NSF). In FY 2017, NIJ funded two agreements for a total of $0.7 million. One new interagency agreement is to convene a working group on Human Factors in DNA Analysis that will conduct a scientific assessment of the effects of human factors on forensic analyses, with the goal of recommending strategies and approaches to improve practice and reduce the likelihood of errors. This project will also involve a review of current practices, processes, and procedures to identify and document where uncertainty and/or variability in practice could occur. Another IAA will convene an Evidence Retention and Preservation committee to develop best practices for the proper preservation of evidence and to strengthen America's criminal justice system. For more information on these IAAs, visit https://www.NIJ.gov/funding/awards/Pages/interagency-agreements.aspx.

FBI/NamUs Partnership

In March 2017, NIJ's NamUs program submitted over 1,500 fingerprint images from unidentified persons to the FBI's Latent Print Support Unit. These images were run through a new technology known as Next Generation Identification.

This technology allows analysis of poor-quality entries in the FBI's fingerprint database, enabling more focused searches and increasing the likelihood of an identification even with prints that have been searched in the past.

Through this partnership, over 200 identifications were made in four months.

For more information: Seth Augenstein, "FBI and NamUs Partnership IDs Victims, Killers, Unknown Nationwide," *Forensic Magazine,* September 5, 2017.

Technical Assistance for Forensic Laboratories and Law Enforcement Agencies

Programs in this category are designed to assist law enforcement agencies and forensic science laboratories; this category includes the National Missing and Unidentified Persons System (NamUs), the Forensic Technology Center of Excellence (FTCoE), and the Strengthening the Medical Examiner-Coroner System Program. These programs ultimately further DOJ's mission by reducing violent crime, assisting prosecutors in their efforts, and helping to reduce the nation's opioid epidemic.

National Missing and Unidentified Persons System

The National Missing and Unidentified Persons System (NamUs) is a national centralized repository and resource center for locating and identifying missing persons and unidentified human remains, and for repatriating unclaimed persons. NamUs is a web-based system provided free of charge to medical examiners, coroners, law enforcement officials, allied forensic professionals, families of lost loved ones, and the general public who are trying to resolve cases. With users in all 50 states, NamUs is a collaborative system that bridges the communication gap among stakeholder communities, fostering enhanced information sharing and case support. NamUs currently has records for 13,509 missing persons and 11,515 unidentified persons. NamUs also has 4,191 cases in the Unclaimed Persons database, who are decedents that have been identified but have yet to be claimed. Since its development in 2007, NamUs has helped to resolve over 1,200 unidentified person and over 1,750 missing person cases. The system is currently undergoing an upgrade that will include significant enhancements to improve the user experience and make searching the data in the system more efficient and effective. A market release date in early 2018 is anticipated. The NamUs program continues to address the Attorney General's directive for "prompt and accurate forensic science analysis to our law enforcement officers and prosecutors" by making forensic services available for these extremely difficult cases at no cost to state and local agencies. These complicated samples, if submitted to local laboratories, would contribute to the backlog of DNA samples because they are complex and require specialized methods not available at many forensic laboratories.

In FY 2017, NIJ continued funding for NamUs by awarding a total of $7.5 million to the University of North Texas Health Science Center. NIJ received a separate appropriation for $2.2 million, but this is insufficient to maintain, operate, and enhance NamUs. This year, NIJ supplemented NamUs with $4.1 million from the DNA-related and other forensic activities appropriation and $1.2 million from the Office of Violence Against Women (OVW) and the Office for Victims of Crime (OVC).

- For more information about NamUs, visit https://namus.gov.

Forensic Technology Center of Excellence

To improve and advance the practice of forensic science, it is imperative that emerging technologies and methodologies be adopted in forensic testing. One strategy NIJ has taken to address this need is through its support of the Forensic Technology Center of Excellence (FTCoE). The FTCoE is charged with facilitating the transfer of technology, methodology, and best practices into forensic laboratories in order to improve the practice of forensic science. NIJ's FTCoE manages the testing and evaluation of emerging technologies applicable to forensic science. By identifying and removing the potential barriers

Webinar Series: Opioid Epidemic

A new webinar series on the opioid epidemic and crisis seeks audiences in law enforcement, the medical professions, laboratories, and legal agencies who are battling unmanageable caseloads of opioid abuse, economic shortfalls, and challenges to safety, analytical preparedness, and basic education and training. This webinar series shows how different criminal justice disciplines are addressing these challenges, sharing their knowledge, and advancing science, technology, and law. The first webinar in this series had 246 people in attendance.

that often derail the implementation and acceptance of new and innovative technologies, the FTCoE places promising technical innovations in the hands of forward-thinking practitioners, stakeholders, and policymakers. NIJ's FTCoE is currently managed through RTI International and its collaborating academic partners — Duquesne University, Virginia Commonwealth University, and the University of North Texas Health Science Center. The FTCoE has also published reports and articles to help transfer knowledge and inform the forensic community on various forensics-related topics, some of which include Breath Alcohol Instrumentation for Law Enforcement and 3D Crime Scene Landscaping Tools. The Breath Alcohol Instrumentation for Law Enforcement report was published as a landscape study in collaboration with key stakeholders and manufacturers to document the concerns over reliability and defensibility of data acquired using portable breath alcohol instruments, cited as the primary barrier to implementation. This study (1) compiles performance statistics of available portable instruments approved for evidential data collection, (2) summarizes variables for these devices (price, features, and accessories), (3) identifies any procedures and best practices from agencies currently using portable instruments, and (4) provides feedback regarding ease of use in the field. The 3D Crime Scene Landscaping Tools report provides readers with a basic understanding of 3D laser scanning instruments and their use, benefits, and limitations. It discusses forensic applications associated with 3D laser scanner technology and provides the forensic community with an impartial resource that compares the features and capabilities of the available 3D laser scanning instruments.

In addition to landscape studies, reports, and live webinar events, the FTCoE hosts Technology Transition Workshops that allow for hands-on work in various technologies and processes in the forensic field. For example, the FTCoE hosted "Courtroom Knowledge of Forensic Technology and the Impact of *Frye* and *Daubert* Standards," which targeted the following audience: legal professionals, including criminal court judges, prosecuting and defense attorneys, and legal academicians. The workshop focused on introducing and enhancing the knowledge of innovative forensic technologies to legal professionals.

In FY 2017, NIJ continued funding for the FTCoE by awarding $3.3 million to RTI International.

- A comprehensive collection of FTCoE activities — including associated reports, evaluations, workshops, databases, archived events, and other educational opportunities — can be found at www.forensiccoe.org.

Strengthening the Medical Examiner-Coroner Program

The National Science and Technology Council's Fast-Track Action Committee on Strengthening the Medicolegal-Death-Investigation System's (FTAC-SMDIS) report, titled *Strengthening the Medicolegal-Death-Investigation*

ONLINE TRAINING

Live webinars serve as knowledge transfer events to educate the forensic science community.

Since 2011, the FTCoE has used online training events to train forensic science professionals, law enforcement, researchers, lawyers, sexual assault nurse examiners, and policy-related professionals:

- Over 120,000 hours of training.
- 458 online events, both live and on demand.
- Over 71,000 attendees from 176 countries, including 57,000 attendees from the United States.

Rapid DNA Webinar Series
A webinar series on the topic of Rapid DNA was co-hosted by the American Society of Crime Lab Directors (ASCLD) and was designed to investigate the validation, current use, and future implementation of Rapid DNA. Presentations outlined the FBI's concept for integration of Rapid DNA machines within booking stations, fingerprint instruments, and state criminal history records, appealing to the law enforcement community.

System: Improving Data Systems, notes that death investigations performed by medical examiner-coroner (ME/C) offices are vital to criminal justice by investigating violent deaths. Of the estimated 2.6 million deaths annually, ME/C offices investigate nearly 500,000 cases in approximately 2,400 jurisdictions. FTAC-SMDIS found that the ME/C community lacks adequate personnel and resources to address the country's medicolegal death investigation (MDI) needs. In addition, FTAC-SMDIS reports that there are systemic issues with death investigation data quality and infrastructure, inadequate facilities, and inconsistent expertise levels.[25] Other reports, such as the 2009 National Academy of Sciences report, *Strengthening Forensic Science in the United States: A Path Forward,* have also stated that "funding should be available to support pathologists seeking forensic fellowships" and asserted the need to "modernize and improve the medicolegal death investigation system" by way of addressing deficient facilities, equipment, staffing, education, and training for MDI.[26]

In support of the Medical Examiner-Coroner system program, NIJ introduced a new solicitation for FY 2017: Strengthening the Medical Examiner-Coroner System (ME/C) program. The ME/C program is competitive and designed to support the enhancement of MDI services and increase the supply of forensic pathologists nationwide. NIJ accepted proposals in two purpose areas:

- Purpose Area 1: Forensic Pathology Fellowships
- Purpose Area 2: Medical Examiner-Coroner Office Accreditation

Medical examiners and coroners (ME/C) are responsible for investigating deaths and injuries that occur under unusual or suspicious circumstances, performing post-mortem examinations to determine the cause and manner of death, and recovering any evidence that may be used to solve crimes. ME/C also serve as public health officers; as such, they "surveil for index cases of infection or toxicity that may herald biological or chemical terrorism, identify diseases with epidemic potential, and document injury trends." This program will increase the number of board-certified forensic pathologists and support an independent measure of quality assurance to produce a forensically documented, accurate, and credible death investigation product by providing resources for agency accreditation. This program furthers the priorities of DOJ by helping reduce violent crime, supporting prosecutors in their efforts, and supporting new technologies and strategies to address the opioid epidemic.

In 2017, NIJ made 14 awards totaling $2.3 million under this program. Seven awards under Purpose Area 1 resulted in the funding of eight fellows, and seven awards were made under Purpose Area 2.

- The FY 2017 Solicitation for the Strengthening the Medical Examiner-Coroner System program can be found at https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2017-11566.pdf (PDF, 43 pages).

ONGOING EFFORTS: FBI/NIJ SAK PARTNERSHIP

Under an IAA, NIJ and the FBI partnered in 2014 to create a program by which state and local law enforcement agencies can send their SAKs to be analyzed for free. The program, using previous years' funding, yielded these results as of October 31, 2017:

- Over 2,800 SAKs processed.
- Over 1,300 CODIS entries.
- Over 520 investigative leads (hits).
- *National Best Practices for Sexual Assault Kits: A Multidisciplinary Approach* publication includes information learned from this program.

For more information: https://www.NIJ.gov/topics/law enforcement/investigations/sexual-assault/Pages/nij fbi sak initiative.aspx

Summary

This report summarizes the continuing impact that NIJ's programs are having on the criminal justice community. In FY 2017, NIJ continued its commitment to a strategy that couples rigorous research and development with capacity enhancement and technical assistance to not only serve the needs of law enforcement and forensic science communities but also to further the priorities of DOJ by helping to reduce violent crime, supporting prosecutors in their efforts, and supporting new technologies and strategies to address the opioid epidemic. For research and development, capacity enhancement, and technical assistance in forensic science, NIJ made 359 awards in FY 2017 for a total of $135.3 million, which includes the programs and categories of funding discussed in this report, as well as NIJ's appropriations for the Paul Coverdell Forensic Science Improvement Grants program, the Kirk Bloodsworth Post-Conviction DNA Testing Grant program, the Sexual Assault Forensic Exam program, and general research efforts to strengthen forensic science. The need for this assistance has never been greater; our nation's forensic science laboratories continue to be overwhelmed with increasing demands to process and test all types of evidence. Through capacity building, technical assistance, research, development, evaluation, and dissemination, NIJ is working to address the challenges experienced by forensic laboratories. Thanks to its efforts, the capacity in forensic science laboratories is continuing to increase; innovative technologies are allowing the community to solve cold cases, reunite missing persons with their families, identify previously unidentified decedents, and help exonerate the innocent; and advancements in research and development are leading to more cost-efficient, accurate, and reliable techniques. This strategy promotes the long-term success of the criminal justice system, ultimately improving public safety.

Endnotes

1. H.R. 244, *Consolidated Appropriations Act, 2017,* p. 70: https://www.congress.gov/115/bills/hr244/BILLS-115hr244enr.pdf.
2. Ibid.
3. SEC. 213. At the discretion of the Attorney General, and in addition to any amounts that otherwise may be available (or authorized to be made available) by law, up to 7 percent of funds made available for grant or reimbursement programs — (1) under the heading ''State and Local Law Enforcement Assistance'' (except for funds made available under paragraphs (1), (2), and (16) under such heading); and (2) under the headings ''Juvenile Justice Programs'' (except for funds made available under paragraph (5) under such heading) and ''Community Oriented Policing Services Programs,'' to be transferred to and merged with funds made available under the heading ''State and Local Law Enforcement Assistance,'' shall be available for tribal criminal justice assistance without regard to the authorizations for such grant or reimbursement programs.
4. Learn more about NIJ Technology Working Groups at NIJ.ojp.gov, keyword: Forensic Science Technology Working Group.
5. "Attorney General Jeff Sessions Announces New Initiatives to Advance Forensic Science and Help Counter the Rise in Violent Crime," Press Release, Office of Public Affairs, U.S. Department of Justice, updated April 10, 2017, https://www.justice.gov/opa/pr/attorney-general-jeff-sessions-announces-new-initiatives-advance-forensic-science-and-help.
6. Ibid.
7. The total amount available to NIJ for obligation for programs was reduced by assessments for management and administration and for costs such as peer review of grant applications.

8. Other funding sources include transfers from the Bureau of Justice Assistance (BJA), the Office of Violence Against Women (OVW), and the Office for Victims of Crime (OVC); funding from a set-aside by the Director of NIJ; funding from the Sexual Assault Forensic Exam program; and carryover funding from FY 2016.

9. "FORESIGHT Overview." West Virginia University College of Business and Economics.

10. Supply includes accredited laboratories, trained analysts, operational instrumentation, validated methods, and laboratory supplies.

11. Demand is defined as the requests for DNA evidence testing in an accredited laboratory.

12. https://www.bjs.gov/content/pub/pdf/pffclrs14.pdf.

13. This survey included federal laboratories.

14. Data are from FBI's NDIS Statistics webpage, https://www.fbi.gov/services/laboratory/biometric-analysis/codis/ndis-statistics, coupled with NIJ staff calculations.

15. https://www.congress.gov/113/plaws/publ4/PLAW-113publ4.pdf, Title X, 127 Stat. 127.

16. https://www.NIJ.gov/topics/law-enforcement/investigations/sexual-assault/Pages/national-best-practices-for-sexual-assault-kits.aspx.

17. https://www.NIJ.gov/funding/Documents/solicitations/NIJ-2016-10020.pdf.

18. National Research Council, *Strengthening the National Institute of Justice* (Washington, DC: The National Academies Press, 2010), doi:10.17226/12929.

19. National Academies of Sciences, Engineering, and Medicine, *Support for Forensic Science Research: Improving the Scientific Role of the National Institute of Justice* (Washington, DC: The National Academies Press, 2015), doi:10.17226/21772.

20. Funding for research and development was supplemented from other NIJ resources in addition to the appropriation for DNA and other forensics mentioned earlier in this report.

21. The most recent list of needs and requirements was based on discussions at the 2016 Forensic Science Technology Working Group meeting held on December 13-14, 2016. Lists are posted on NIJ's website at https://www.NIJ.gov/topics/forensics/pages/forensic-operational-requirements.aspx.

22. Public Law No. 115-50, https://www.congress.gov/115/plaws/publ50/PLAW-115publ50.pdf.

23. Peterson, Joseph L., Matthew J. Hickman, Kevin J. Strom, and Donald J. Johnson, "Effect of Forensic Evidence on Criminal Justice Case Processing." *Journal of Forensic Sciences* 58 no. S1 (January 2013): S78-S90.

24. https://www.ncjrs.gov/pdffiles1/nij/248572.pdf.

25. White House National Science and Technology Council, "Strengthening the Medicolegal-Death-Investigation System: Improving Data Systems," White Paper, September 2016, https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/strengthening_the_medicolegal_death_investigation_system_final.pdf.

26. National Research Council, Committee on Identifying the Needs of the Forensic Sciences Community, "Strengthening Forensic Science in the United States: A Path Forward," Final report to the National Institute of Justice, August 2009, grant number 2006-DN-BX-0001, NCJ 228091, https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf.

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