



NIJ

National Institute of Justice

JOURNAL



Missing Persons and Unidentified Remains: The Nation's Silent Mass Disaster

by Nancy Ritter

**Making Every Encounter Count: Building Trust
and Confidence in the Police**

by Jake Horowitz

Sexual Assault in Abusive Relationships

by Lauren R. Taylor with Nicole Gaskin-Laniyan

Online DNA Training Targets Lawyers, Judges

by Glenn R. Schmitt

Identifying Remains: Lessons Learned From 9/11

by Nancy Ritter

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DIRECTOR'S MESSAGE

Making a difference in the lives of individual Americans.

Although this phrase may define the core mission of many governmental agencies, it is used so often that, at times, the meaning can feel hackneyed and diluted. But in this issue of the *Journal*, you will see real examples of how NIJ's work makes a difference in the lives of real people—people like Melody Reilly, who recently sat in a Texas courtroom to watch the sentencing of the men who murdered her brother and dumped his body in a field. The Center for Human Identification, an NIJ-supported forensic laboratory that uses the most advanced DNA technologies to solve missing persons and unidentified human remains cases, was able to identify Shawn Reilly's bones ... and help bring his killers to justice. Learn more about the Center for Human Identification in our lead article, "Missing Persons and Unidentified Remains: The Nation's Silent Mass Disaster," and how the services of this unique DNA laboratory are available to every law enforcement officer, medical examiner, and coroner in the country.

Another example of DNA technology making a difference in individual lives occurred on a tragically grand scale on September 11, 2001. On the 5th anniversary of the terrorist attacks, NIJ published a major report on how DNA was used to identify the victims. But this report is much more than a historical document. It also looks to the future, offering guidance from an NIJ-supported panel of forensic experts on how to prepare for another large-scale DNA identification effort, whether from a terrorist attack, a mass transportation accident, or a natural disaster. Our story "Identifying Remains: Lessons Learned From 9/11" highlights the full report.

Our third DNA-related story is another example of how NIJ makes a difference. "Online DNA Training Targets Lawyers, Judges" showcases one of our most recent (and exciting) tools: online training to help criminal justice practitioners—judges, prosecutors, and criminal defense attorneys—use DNA evidence in the pursuit of truth in the courtroom.

All three of these examples are made possible by funding under the President's DNA Initiative, a 5-year effort to enhance the use of this important tool to solve crimes and protect the innocent. NIJ is privileged to administer the Initiative, *Advancing Justice Through DNA Technology*, on behalf of the Administration and the U.S. Department of Justice.

But this issue of the *Journal* is not just about DNA. In it, you will also find articles about the public's perception of police officers and the correlation between sexual and physical assaults on women in relationships. Both provide important information that practitioners and policymakers should know.

Whether forensics, policing, or violence against women, these—and many other key criminal justice areas—are supported by NIJ's research, development, and evaluation. I hope that the results of our work, highlighted in this and other issues of the *Journal*, will help you in your work to further the cause of justice in America.



Glenn R. Schmitt
Acting Director, National Institute of Justice



BUILDING
KNOWLEDGE TO
MEET THE CHALLENGE OF
CRIME AND JUSTICE

National Institute of Justice

Glenn R. Schmitt
Acting Director

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Missing Persons and Unidentified Remains: The Nation's Silent Mass Disaster

by Nancy Ritter

About the Author

Nancy Ritter is a writer/editor at the National Institute of Justice and Editor of the *NIJ Journal*.

If you ask most Americans about a mass disaster, they're likely to think of the 9/11 attacks on the World Trade Center, Hurricane Katrina, or the Southeast Asian tsunami. Very few people—including law enforcement officials—would think of the number of missing persons and unidentified human remains in our Nation as a crisis. It is, however, what experts call “a mass disaster over time.”

The facts are sobering. On any given day, there are as many as 100,000 active missing persons cases in the United States. Every year, tens of thousands of people vanish under suspicious circumstances. Viewed over a 20-year period, the number of missing persons can be estimated in the hundreds of thousands.

Due in part to sheer volume, missing persons and unidentified human remains cases are

a tremendous challenge to State and local law enforcement agencies. The workload for these agencies is staggering: More than 40,000 sets of human remains that cannot be identified through conventional means are held in the evidence rooms of medical examiners throughout the country.¹ But only 6,000 of these cases—15 percent—have been entered into the FBI's National Crime Information Center (NCIC) database.

Efforts to solve missing persons cases are further hindered because many cities and counties continue to bury unidentified remains without attempting to collect DNA samples. And many labs that are willing to make the effort may not be equipped to perform DNA analysis of human remains, especially when the samples are old or degraded.

Compounding this problem is the fact that many of the Nation's 17,000 law enforcement agencies don't know about their State's missing persons clearinghouse or the four

THE FEDERAL DATABASES AND WHAT THEY DO

- **CODIS(mp)** (Combined DNA Index System for Missing Persons): Also known as the National Missing Person DNA Database (NMPDD), CODIS(mp) is a database specifically designed to assemble data on missing persons and unidentified human remains cases. It was created in 2000 by the FBI using existing portions of the CODIS database. The searchable database includes information on nuclear and mitochondrial DNA obtained from unidentified remains, relatives of missing persons, and personal reference samples. Having both types of DNA profiles maximizes the potential for a successful identification.
- **IAFIS** (Integrated Automated Fingerprint Identification System): Maintained by the FBI's Criminal Justice Information Services Division, this national fingerprint and criminal history database provides automated fingerprint search capabilities, latent search capability, electronic image storage, and electronic exchange of fingerprints and responses. Agencies may submit fingerprints electronically and will receive quick turnaround on analyses.
- **NCIC** (National Crime Information Center): An information system maintained by the FBI and dedicated to serving and supporting Federal, State, and local criminal justice agencies.
- **ViCAP** (Violent Criminal Apprehension Program): This nationwide data center is designed to collect, collate, and analyze information on crimes of violence, such as homicides, sexual assaults, kidnappings, and missing persons cases.

Federal databases—NCIC, National Crime Information Center; CODIS(mp), Combined DNA Index System for Missing Persons; IAFIS, Integrated Automated Fingerprint Identification System; and ViCAP, Violent Criminal Apprehension Program—which can be invaluable tools in a missing person investigation. (See sidebar above, “The Federal Databases and What They Do.”) Even in jurisdictions that are familiar with the State and Federal databases, some officials say they have neither the time nor the resources to enter missing persons and unidentified human remains data into the systems.

Bridging the Gap

To help State and local jurisdictions address the country's “mass disaster over time,” the National Institute of Justice (NIJ) has brought together some of the country's top criminal justice and forensic science experts. As part of the President's multiyear initiative to maximize the use of forensic DNA in solving crime, NIJ is making Federal resources

available to State and local law enforcement officials to identify human remains and help solve missing persons cases.

NIJ's plan is multifaceted. It includes programs aimed at:

- Training medical examiners, law enforcement officers, and victims' families on forensic DNA evidence.
- Providing free testing of unidentified human remains and family reference samples.
- Encouraging States—through proposed model legislation—to collect DNA samples before unidentified remains are disposed of and to analyze degraded and old biological samples.
- Making DNA reference sample collection kits available, free of charge, to any jurisdiction in the country.
- Increasing law enforcement's use of Federal databases to solve missing persons and unidentified human remains cases.

No longer does solving a missing persons or unidentified human remains case have to depend on a break in the investigation because we now have the design and protocol of pure science.

“CSI” Meets the Real World

Many of the people who go missing in the United States are victims of homicide. Although the conventional approach to locating a missing person is to initiate a criminal investigation into the disappearance, in many cases, the investigation begins at a different point—when human remains are found.

This is where the Center for Human Identification (CHI) steps in. Located at the University of North Texas Health Science Center, CHI is one of NIJ’s largest and most exciting DNA projects. At CHI’s laboratory in Ft. Worth, State and local law enforcement agencies can have nuclear and mitochondrial DNA (mtDNA) testing performed on skeletal remains and on missing persons’ family and direct reference samples.² Experts at CHI’s Laboratory for Forensic Anthropology, such as Harrell Gill-King, Ph.D., also perform anthropological examinations on unidentified human remains to determine manner and cause of death. All of this testing is free.

NIJ’s funding of this revolutionary project means that every jurisdiction in the United States has access to one of the few laboratories in the country that can search mtDNA and short tandem repeat (STR)³ profiles in the CODIS(mp) database.

It also means that Dereck Bachmann can finally stop looking for his sister.

Finally, Closure

Marci Bachmann was 16 when she ran away from her Vancouver, Washington home in May 1984. Although her remains were found a few months later—discovered in the woods near Deer Creek in Missoula, Montana—no one knew that the remains were hers.

For nearly two decades, Dereck, Marci’s brother, searched newspapers and missing persons files and even hired a private investigator to find Marci. Finally, in 2004, a series of events brought him and his family the closure they were seeking.

It began when a cold case detective in Missoula heard about CHI. The detective

sent a femur from the Deer Creek remains to the lab. There, scientists ran DNA tests on the bone fragments and uploaded the profile into the CODIS(mp) database. Meanwhile, in King County, Washington, authorities working on an unrelated murder case came across Marci’s missing persons file. Detectives tracked down Marci’s mother, obtained a DNA sample from her, and sent it to the CHI lab. When a database search indicated a potential match with the remains of the victim in the Deer Creek case, officials sent DNA from Marci’s brother and father to CHI for further tests.

On April 6, 2006—more than 21 years after her body was unearthed from a shallow grave—Marci Bachmann was “found.”⁴

Solving Cold Cases

When George Adams, program manager for CHI, is asked about cold hits like the Marci Bachmann case—where the DNA from unidentified remains matches the DNA from reference samples that have been sent to the lab without any apparent connection—he paraphrases Vernon Geberth from *Practical Homicide Investigation: Tactics, Procedures, and Forensic Techniques*. “Solving a cold case like Marci’s is not a matter of chance or luck; it is, quite simply, a matter of design and protocol.”

The “design” Adams refers to is the CODIS(mp) database. The “protocol” works like this: A person goes missing; if he or she is not found within 30 days, a family reference sample is obtained. The sample can take either of two forms—a DNA sample from a close relative (obtained by a simple, noninvasive cheek swab) or from a personal item belonging to the missing person (such as hair from a comb or saliva from a toothbrush). The sample is then sent to the lab, and the DNA is analyzed. The results or “profiles” are then loaded into the database.

Simultaneously, human remains found throughout the country are being sent to CHI’s lab for analysis and uploading into the database. DNA profiles from missing

persons or their families are compared with unidentified human remains in the CODIS(mp) database. "If we already have the family reference sample, we *will* get a match," Adams stated. No longer does solving a missing persons or unidentified human remains case have to depend on a "break in the investigation," he added, "because we now have the design and protocol of pure science."

Populating the Database: Sample Collection Kits

But the database will help solve cases only if profiles from DNA samples and recovered human remains are submitted for analysis and uploaded into the system. "We've seen a tremendous increase in the number of remains samples, but we really need to work on getting family reference samples," said Arthur Eisenberg, Ph.D., director of CHI and a member of NIJ's Missing Persons National Task Force. "If families don't send reference or biological samples—which at this stage must be collected by a law enforcement official—human remains cannot be identified."

To facilitate this process, NIJ has funded CHI's development of two DNA sample collection kits: one for family reference samples and the other for collecting and transporting human remains. Both kits are available free of charge to any police department, medical examiner, or coroner in the United States. As of July 2006, more than 4,000 family reference sample kits had been disseminated.

Getting the Word Out

Spreading the word about this free resource remains a challenge. Last June, the Washington State's Office of the Attorney General issued a bulletin encouraging local jurisdictions to send family reference samples to CHI, making Washington the first State to solicit samples on a statewide basis. Eisenberg said he has no doubt that as word of the CHI analysis and database spreads, it will come to be regarded not as a tool of last resort in missing persons and unidentified human remains cases, but rather as a primary investigative tool.

ONE FACE BEHIND NIJ'S WORK

Melody Reilly's brother, Shawn, was murdered in the summer of 2005. His body was dumped in a field in rural Bastrop County, Texas, and was extremely decomposed when found. A year later, the Center for Human Identification (CHI), at the University of North Texas Health Science Center, identified Shawn's body from his DNA. Here is



Shawn Reilly

the letter that Melody wrote to George Adams, of CHI, after the men who killed her brother were convicted.

Dear Mr. Adams,

I just want to tell you how much your office's work means to me, my sisters, our husbands, children, and extended family. Also on behalf of our parents, who are no longer here; but I am sure they appreciate your efforts, as well.

My sister Michelle and I were in court during the trial last week, and it was so comforting to see the people who worked so hard to identify my brother's remains.

My brother, Shawn, was an amazing and special person who ended up in the company of the wrong, and the worst, people. What our family has gone through is almost the worst you can imagine—wondering where Shawn was, hoping the remains were not his. The only thing worse is the terrible thought of not knowing where my brother is now. I wish he was here next to me, laughing and smiling, but unfortunately that is no longer possible. What your office did to identify my brother and allow us to bring his remains home is something I can never repay or express enough gratitude for. It really scares me to think we could be in a completely different place right now.

We feel badly because we put so much pressure—sometimes daily—on Investigator Yarbrough to give us some answers from August through March, and he tried his best to keep us calm. I didn't realize how much work and time it takes to identify someone, and I am now happy that your office took every day and every minute they needed to get it done properly.

Please pass my thoughts on to those involved and let them know their work is important and invaluable. I am attaching a photo of Shawn so maybe you and they can have a nicer image of him.

Melody Reilly

As of July 2006, CHI had received more than 680 unidentified human remains and more than 1,600 family reference samples. Importantly, the lab is in the final stages of being able to use robots, which will allow the number of DNA analyses to skyrocket: one robot, for example, will be able to analyze 17,800 DNA samples per year.

Five States—California, Kansas, Nevada, New Mexico, and Texas—have laws that focus on locating missing persons and identifying human remains. In 2005, NIJ brought together, Federal, State, and local law enforcement officials, forensic scientists, victims advocates, legislators, and families of missing persons to draft model State legislation on the prompt collection, analysis, and dissemination of evidence to help solve these cases. (See www.ncjrs.gov/pdffiles1/nij/210740v2.pdf.) Seven States (Alabama, Arizona, Hawaii, Illinois, Maryland, Ohio, and Washington) and the District of Columbia have introduced bills that use the proposed legislation as guidance. Also, legislators in Kansas and New Mexico are seeking to amend their existing laws.

Moving to Solve the Problem

In addition to prohibiting the cremation of unidentified remains, the model legislation would require that:

- Law enforcement agencies accept every missing person report and share case information with State and regional authorities.
- DNA samples be taken within 30 days of a missing person report and the individual's profile be added to national, State, and local databases.
- Cases involving high-risk missing persons be assessed immediately (high-risk cases might include, for example, a possible stranger abduction or a person who requires medical attention or is mentally impaired).
- DNA analysis be performed on all unidentified human remains.

Searching the Databases

One of the biggest challenges in missing persons and unidentified human remains cases is searching and correlating case information. The Missing Persons National Task Force is examining ways that Federal databases can share information to help solve these cases.

The challenge is significant. For example, NCIC contains more than 100,000 missing persons cases, but the Integrated Automated Fingerprint Identification System contains only 47. NCIC contains just 15 percent of unidentified human remains cases, in part because it is so labor intensive to enter the data into the system. To encourage State and local law enforcement agencies' use of NCIC, the FBI published an updated version of the Missing Persons and Unidentified Persons data collection guides, which walk users through the process of comparing new and existing data on missing persons and unidentified human remains investigations. Electronic versions of the guides are available to law enforcement officials through the Law Enforcement Online (LEO) intranet.

ViCAP is another valuable tool available to State and local officials. It is also underused for several reasons. Because data entered into NCIC do not automatically populate the ViCAP database (which is also run by the FBI), many jurisdictions choose not to use it. And until recently, most of the Nation's medical examiners and coroners did not have access to ViCAP. This situation is changing, however, as the FBI negotiates memoranda of understanding with local jurisdictions that will give medical examiners and coroners access to the database. The FBI is also developing a DVD for law enforcement that explains how ViCAP works. And with help from the Criminal Justice Information Services (CJIS) Division, ViCAP may soon be Web-enabled. Instead of having to enter case information via a CD-ROM, which is then mailed to CJIS for uploading, users would need only an Internet connection and an LEO account to enter case data directly into ViCAP.

Law Enforcement Training ... and More

In addition to funding CHI's work, NIJ administers a wide range of projects under the President's DNA Initiative. One major effort involves the training of police officers; prosecutors, defense counsel, and judges; forensic and medical specialists; victim service providers; and corrections, probation, and parole officers on the use of forensic DNA evidence. To date, NIJ has held two regional missing persons training conferences, and by the end of 2006, NIJ's missing persons training reached professionals from all 50 States. NIJ is also developing many types of electronic training tools—one recent release is *Principles of Forensic DNA for Officers of the Court*, an interactive, computer-based training program on the use of DNA evidence in the courtroom.

Other NIJ programs seek to eliminate the backlog of biological samples in murder, rape, and kidnapping cases in forensic laboratories across the country. Since 2004, NIJ has provided funding to State and local agencies to reduce casework and convicted offender backlogs. NIJ also supports the development of tools and technology for faster, less costly methods of DNA analysis, including ways to analyze smaller and more degraded biological samples.

And NIJ will continue to fund programs that enhance the use of DNA to solve crimes, protect the innocent, and identify missing persons.

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For More Information

- For DNA sample testing kits and free testing of DNA samples, contact the Center for Human Identification at 1-800-763-3147, or visit www.hscunt.edu/departments/pathology_anatomy/dna/forensic.htm.
- Information on improving the use of forensic DNA evidence throughout the Nation's criminal justice system can be found at www.dna.gov.
- An online training program for prosecutors, defense attorneys, and judges, *Principles*

NIJ has held two regional missing persons training conferences, and by the end of 2006, NIJ's missing persons training reached professionals from all 50 States.

of Forensic DNA for Officers of the Court, can be downloaded at www.dna.gov/training/otc. (See "Online DNA Training Targets Lawyers, Judges" on p.16.)

- An electronic version of the FBI's Missing Persons and Unidentified Persons data collection guide is available to law enforcement officials through the LEO Intranet at <http://home.leo.gov/lesig/cjis/programs/ncic>.

Notes

1. The Bureau of Justice Statistics is finalizing a comprehensive census of the Nation's medical examiners and coroners. This study—expected to be published in early 2007—will examine data from 2,000 medical examiners and coroners and focus on the issue of unidentified human remains.
2. Nuclear DNA is the genetic material inherited from both parents: half from the mother and half from the father. It is found in the nucleus of each cell and is unique to each individual (except in cases of identical twins). Nuclear DNA is a powerful identifier and has been used for forensic purposes for decades. Mitochondrial DNA (mtDNA)—which is found in the mitochondria of a cell, outside the nucleus—is inherited solely from the mother and is not unique. Everyone in the same maternal line, for generations, will have the same mtDNA. Its use as a forensic tool in narrowing the pool of possible donors of a sample is a more recent development.
3. Short tandem repeats (STRs) are short sequences of DNA nucleotides that are repeated numerous times. An individual genetic profile can be created by counting the number of repeats of the DNA sequence at a specific location on a chromosome. This repeat number varies greatly between individuals.
4. According to authorities in Missoula, Marci Bachmann was murdered by Missoula serial killer Wayne Nance.



Making Every Encounter Count: Building Trust and Confidence in the Police

by Jake Horowitz

About the Author

Jake Horowitz is a Senior Associate at The Pew Charitable Trusts.

Several years ago in the Flatbush neighborhood of Brooklyn, New York, police officers responded to a report of youths stealing from a street vendor. When the uniformed officers arrived on the scene, the youths reacted confrontationally: “Why are you harassing me? I’m just on my way home from school. How dare you! You’re just doing this ‘cause I’m black.”¹

A large group of onlookers formed. One of the officers said that he sensed the youths were hoping to “get the crowd working against us ... [so we would] ... just back off.” While the officer was explaining to the crowd why they were there, a woman in the crowd spoke up. “I remember this guy,” she told the others. “I got my purse robbed 2 months ago and he was really good; he treated me well. I think he’s a good cop and I trust him.”

The woman’s unsolicited comments quelled the crowd, which quickly dispersed without incident. The officer later reflected on the encounter. “I never forgot that lesson,” he noted. “You never know when treating people well will pay off—not just in satisfying what you owe to citizens—but in this larger communal sense of gaining allies.”

What Factors Affect Public Satisfaction With the Police?

Satisfaction with the police, while generally high, is unevenly distributed. Understanding why some people harbor negative views about police officers is the first and most important step in building a positive relationship with the community.

NIJ recently funded five studies exploring factors that influence satisfaction with the police. The research suggests that satisfaction is shaped by demographic variables, neighborhood crime conditions, and

experiences with the police—whether first hand or indirect. Race was not found to directly determine level of satisfaction. Instead, researchers concluded that race, due to its correlation with other demographic variables, neighborhood crime rates, and experiences with police, was an indirect influence on the level of satisfaction with the police.

Although community members' views about the police may be stubbornly resistant to change, police officers and policymakers should appreciate that treating individuals respectfully and professionally during each encounter can establish, build, and maintain crucial support for the police within the community.

The Importance of Quality Treatment

When people form opinions of the police based on their interactions, they tend to focus on the process more than the outcome. Impressions of police encounters are influenced by the demeanor as well as the actions of the officer. People pay close attention to the “neutrality of decision making, respectful and polite interpersonal treatment, and ... opportunities for input into decisions,” noted Tom Tyler of New York University.² Researchers often refer to this as a person's sense of “procedural justice.”

People base their impressions of the police on their own personal experiences and on secondhand reports of police encounters. However, because most Americans do not directly interact with the police in any given year, they are forming their opinions on the basis of word-of-mouth accounts from others.

Early studies of satisfaction with police showed that a person's unpleasant experiences had a greater impact than pleasant experiences.³ Newer studies, however, have found that pleasant experiences have a greater influence than researchers originally thought.⁴ As illustrated by the Flatbush officer's experience described at the beginning of this article, positive experiences with the police can have a ripple effect throughout the community.

Every encounter—both pleasant and unpleasant—with the public can greatly affect the community's level of satisfaction with the police.

The implication: Every encounter—both pleasant and unpleasant—with the public can greatly affect the community's level of satisfaction with the police.

It also appears that people bring different expectations to their encounters with the police, depending upon whether those encounters are police- or citizen-initiated. In the past, it was widely assumed that police-initiated encounters had the greatest impact on citizen attitudes.⁵ But NIJ-funded research at the University of Illinois at Chicago contradicts that belief. Instead, researchers found that negative encounters have a greater tendency to erode satisfaction with the police when they are citizen-initiated.⁶ This finding raises the possibility that individuals' unmet expectations of how the police could or should have assisted them during an encounter may be as influential in forming opinions as the experience itself, regardless of whether citizens or police initiate the contact.

Race and the Context of Neighborhoods

Trust and confidence in the police, however, are built on more than police encounters. Recent NIJ studies also explored the role of race in the formation of opinions about the police.

Although the data show that Caucasians hold the police in higher regard than African Americans or Hispanics, race was not found to directly influence how people form opinions about police. In fact, when researchers controlled for factors such as the level of neighborhood crime, the reported quality of police-citizen encounters, and other demographic variables, such as age, income, and education, the effects of race disappeared

The challenge for law enforcement officers is to treat each encounter—whether with a suspect, witness, or complainant—as if it is that person’s first contact with police.

entirely or were substantially reduced. Researchers concluded that race affects satisfaction with the police indirectly and in conjunction with other factors, including the level of crime within one’s neighborhood.⁷

People in low-crime neighborhoods tend to credit police officers with securing and maintaining low crime rates. As a result, perceptions of the police in those neighborhoods are mostly positive. In neighborhoods with higher crime rates—where racial and ethnic minorities are disproportionately represented—the level of community satisfaction with police is substantially lower. These findings illustrate that, in addition to unpleasant police encounters, individuals’ dissatisfaction with crime rates in their community can negatively affect their view of police.⁸

The Impact of Attitudes on Perceptions of Police

Some would argue that satisfaction with law enforcement is a dynamic concept, evolving with each citizen’s interaction with the police. But recent research challenges that contention. Attitudes toward the police appear to be relatively stable, and people’s preexisting views shape their perceptions of future encounters. Researchers at the University of Illinois–Chicago found that residents’ initial attitudes toward the police played a critical role in determining their judgments of subsequent experiences and in the formation of future attitudes toward police.⁹

The challenge for law enforcement officers is to treat each encounter—whether with a suspect, witness, or complainant—as if it is that person’s first contact with police. If he or she believes that the officer was fair and professional, then that person is more likely to have positive impressions of future encounters with police. Making this effort with each and every interaction is an important investment in building goodwill within the community.

Steps to Enhancing a Positive Public Image

Public consent and support of law enforcement are two of the most critical tools on a police officer’s “belt.” People who believe that the police are performing their duties with professionalism and integrity are more likely to obey laws and support the system by acting as witnesses, for example.¹⁰

NIJ’s continuing research into the determinants of satisfaction, trust, and confidence in the police reveals that attitudes toward the police are shaped by a combination of demographic variables, neighborhood conditions, direct and vicarious police citizen encounters, and prior attitudes. The police cannot control some of these factors; others, however, are a direct consequence of an individual officer’s actions and demeanor. Therefore, officers should focus their efforts where they can have the most direct impact: in each day-to-day interaction with the public.

The first step in building good relations with the community is to understand and respond to the expectations of people across a range of possible police encounters. Departments might also consider tracking the level of satisfaction through community surveys. This feedback could be used to design police training and intervention programs. In the end, NIJ’s research illustrates that it behooves our Nation’s police officers to pay close attention to developing what might be called their “bedside manner.”¹¹

For More Information

This article is primarily based on several studies funded by NIJ. The principal investigators published their findings in *Police Quarterly* 8 (3) (September 2005), available at <http://pqx.sagepub.com/content/vol8/issue3>. The articles are:

- Miller, J., R.C. Davis, N.J. Henderson, J. Markovic, and C. Ortiz, "Measuring Influences on Public Opinion of the Police Using Time-Series Data: Results of a Pilot Study."
 - Rosenbaum, D.P., A.M. Schuck, S.K. Costello, D.F. Hawkins, and M.K. Ring, "Attitudes Toward the Police: The Effects of Direct and Vicarious Experience."
 - Skogan, W.G., "Citizen Satisfaction With Police Encounters."
 - Tyler, T.R., "Policing in Black and White: Ethnic Group Differences in Trust and Confidence in the Police."
 - Weitzer, R. and S.A. Tuch, "Determinants of Public Satisfaction With the Police."
2. Tyler, T.R., "Policing in Black and White: Ethnic Group Differences in Trust and Confidence in the Police," *Police Quarterly* 8 (3) (September 2005): 339, available at <http://pqx.sagepub.com/content/vol8/issue3>.
 3. Skogan, W.G., "Asymmetry in the Impact of Encounters With Police," *Policing & Society* 16 (2) (2006): 99.
 4. Rosenbaum, D.P., A.M. Schuck, S.K. Costello, D.F. Hawkins, and M.K. Ring, "Attitudes Toward the Police: The Effects of Direct and Vicarious Experience," *Police Quarterly* 8 (3) (September 2005): 360, available at <http://pqx.sagepub.com/content/vol8/issue3>.
 5. *Ibid.*, 359.
 6. *Ibid.*
 7. Weitzer, R., and S.A. Tuch, "Determinants of Public Satisfaction With the Police," *Police Quarterly* 8 (3) (September 2005): 292; and Skogan, W.G., "Citizen Satisfaction With Police Encounters," *Police Quarterly* 8 (3) (September 2005): 316. Both articles available at <http://pqx.sagepub.com/content/vol8/issue3>.
 8. Weitzer and Tuch, "Determinants of Public Satisfaction," 292.
 9. Rosenbaum et al., "Attitudes Toward the Police," 343.
 10. Tyler, "Policing in Black and White," 333.
 11. Skogan, "Citizen Satisfaction," 310.

Notes

1. Conversation between the author and a New York City police officer assigned to the Flatbush neighborhood, April 2004.



Sexual Assault in Abusive Relationships

by Lauren R. Taylor with Nicole Gaskin-Laniyan

About the Authors

Lauren R. Taylor is a freelance writer. Nicole Gaskin-Laniyan, Ph.D., is a Social Science Analyst in the Violence and Victimization Research Division of the National Institute of Justice.

A recent study funded by NIJ on women who had been physically assaulted by an intimate partner found that two-thirds of the women had also been sexually assaulted by that partner.¹ In addition to a victim's physical and psychological injuries, her older children were found to be at increased risk for depression.

Researchers Judith McFarlane and Anne Malecha from Texas Woman's University collected data from 148 women who sought assistance from the judicial system after being physically assaulted by an intimate partner.² The women, who were interviewed first in 2001, were contacted again in 2003 with questions about forced sex.³ Researchers looked at the incidence and consequences of sexual assault in intimate relationships and compared the findings

with data collected from women who were physically but not sexually assaulted by their partners. The researchers identified risk factors for women in abusive relationships that could be used to develop referral and safety programs for victims and their children.

Impact of Reporting on Revictimization

Most research supports the claim that sexual assault is common in physically abusive relationships. McFarlane and Malecha found that 68 percent of the abused women reported having been sexually assaulted by their intimate partners. Sexual assault occurred repeatedly within these intimate relationships—almost 80 percent of sexually assaulted women reported more than one incident of forced sex.

Most of the women in the study did not report the assault or seek assistance after the first rape—just 6 percent contacted the police after the first rape, and 8 percent applied for a protective order. But women

who did contact law enforcement or seek assistance from the courts were less likely to be revictimized. Specifically, women who contacted the police following the first rape were 59 percent less likely to be raped by an intimate partner again, whether or not the abuser was arrested. Women who applied for a protective order after the first rape were 70 percent less likely to be raped again, whether or not the order was obtained. Most women waited several years after the first sexual assault before applying for a protective order, with Caucasians waiting the longest (on average 8 years), followed by Latina women (5 years), and African American women (3 years).

Physical and Emotional Tolls of Intimate Partner Sexual Abuse

Sexual assault by intimate partners has a profound effect on victims and their children.

Researchers McFarlane and Malecha also found that the sexually assaulted women in the study had worse mental and physical health than women who had been physically but not sexually abused. The women had more post-traumatic stress disorder (PTSD) symptoms, more pregnancies resulting from rape, and more sexually transmitted diseases.⁴ Foreign-born women in the study were found to have a high risk of developing PTSD and also to have fewer social supports. In addition, 27 percent of the women surveyed began or increased their use of alcohol, illicit drugs (usually cocaine), or nicotine after they were sexually assaulted by an intimate partner.

Women who had been sexually assaulted by an intimate partner were also more likely to threaten or attempt suicide than women who were physically but not sexually abused. Twenty-two percent of sexually assaulted women said they had threatened or attempted suicide within 90 days of applying for a protection order, compared with 4 percent of women who were physically abused.

Sexually abused women in the study were also more likely to have had their abusers harass them at work and threaten them with

Older children (aged 12 to 18 years) of sexually abused mothers showed more depression and appreciably more behavioral problems than did children of mothers who had not been sexually assaulted.

murder. Researchers did not find significant differences in these risk factors across ethnicity or race of the women.

What Children Witness

The effect of sexual assault in an abusive relationship permeates a household. Almost 90 percent of children of women in the study who were physically assaulted or both physically and sexually assaulted were exposed to these incidents against their mothers. By the age of 3, 64 percent of the children had witnessed the abuse; 30 percent of them received counseling. Older children (aged 12 to 18 years) of sexually abused mothers showed more depression and had appreciably more behavioral problems than children of mothers who had not been sexually assaulted.

Steps for Change

When a woman is sexually assaulted by an intimate partner, her health—mental and physical—is compromised. Her children's risk for depression is also heightened.

Workers in the justice, health, and social service fields can take steps to help victims of intimate partner sexual assault. The researchers recommend that these professionals:

- Receive training on the frequency and health and safety consequences of intimate partner sexual assault.
- Assess clients for type and frequency of sexual assault.
- Assess victims to determine if they are at risk for PTSD, substance use, and suicide.

- Inform women who have been sexually assaulted by their partner about their higher risk of being murdered by that partner.
- Inform sexually abused immigrant women about their potential increased risk for PTSD.
- Instruct mothers about the potential effects of partner abuse on their children.

This information, delivered with the appropriate referrals and safety planning information, could lead to greater protection for abused women and their children.

NCJ 216525

For More Information

- McFarlane, J., and A. Malecha, *Sexual Assault Among Intimates: Frequency, Consequences, and Treatments*, final report submitted to the National Institute of Justice, 2005 (NCJ 211678), available at www.ncjrs.gov/pdffiles1/nij/grants/211678.pdf.

Notes

1. Sexual assault is defined as forced vaginal, oral, or anal sex.
2. All sought protective orders from the courts. Thirty-three percent were African American, 26 percent were Caucasian, and 41 percent were Latina. Twenty-eight percent were also immigrants. There were no significant demographic differences between the women who had been raped and those who had been physically abused but not raped.
3. Researchers initially interviewed 150 women in 2001. Because 2 of the women died in the interim, only 148 were interviewed in 2003.
4. Twenty percent of the women in the sample had rape-related pregnancies, and 15 percent contracted sexually transmitted diseases.



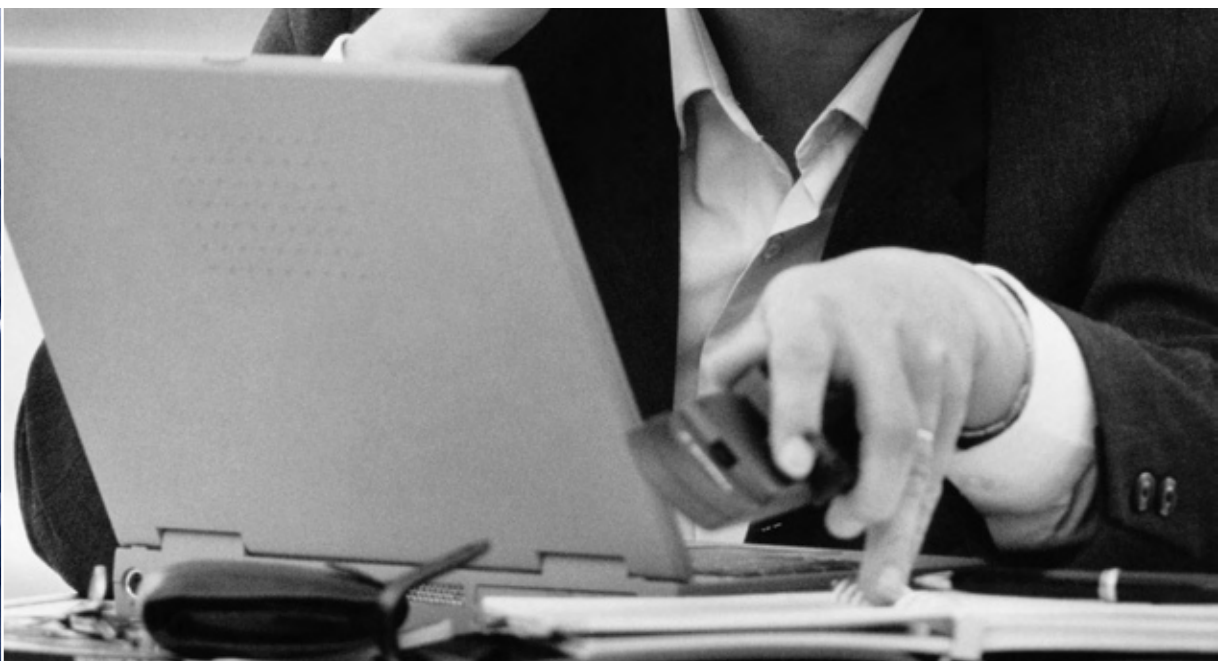
The poster features a dark blue background with a perspective view of classical architectural columns. The text 'The NIJ Conference 2007' is centered in a large, white, sans-serif font. Below this, a horizontal band contains the text 'SAVE THE DATE' in large, bold, white letters, with 'JULY 23-25, 2007' in smaller white text to its right. To the right of the date is a small, square inset image of a human eye with a digital, grid-like pattern overlaid on it. At the bottom of the poster, a dark blue horizontal band contains the text 'TO REGISTER: www.ojp.usdoj.gov/nij' in white.

The NIJ
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Online DNA Training Targets Lawyers, Judges

by Glenn R. Schmitt

About the Author

Glenn R. Schmitt is the Acting Director of the National Institute of Justice.

This article first appeared in the May/June 2006 issue of *The Prosecutor*, a bimonthly publication from the National District Attorneys Association (www.ndaa.org).

In today's criminal justice system, one of the most powerful tools in the search for the truth is DNA evidence. But the complexity of forensic DNA technologies, techniques, and analysis presents new challenges to prosecutors, defense lawyers, and judges.

As new and more complex types of forensic techniques are developed, and as the public becomes aware of them, judges and lawyers are frequently faced with the so-called "CSI Effect"—inflated expectations by jurors of how forensic analysis can be used in criminal investigations. This problem is probably nowhere more pronounced than in the area of forensic DNA analysis. Continuing advances in this field increase jurors'

expectations that science can solve most crimes. The use of forensic DNA analysis is increasing as States continue to pass laws that expand their DNA databases to require all felons and, in some States, even persons arrested for crimes, to provide a DNA sample. The Nation's courts are being called upon to adjudicate an even greater number of cases that involve forensic DNA evidence, and the officers of those courts are being asked to use this type of evidence far more often.

To assist lawyers and judges in the use of DNA analysis in the courtroom, the National Institute of Justice—the research, development and evaluation arm of the U.S. Department of Justice—created an online training program, *Principles of Forensic DNA for Officers of the Court*. NIJ's interactive, computer-based training program discusses DNA evidence from the crime scene to the laboratory, from the courtroom to post-conviction testing, and was funded as part of the President's DNA Initiative, *Advancing*

Justice Through DNA Technology. The DNA Initiative provides operational funding, laboratory capacity-building, training, research and development, and technical assistance to help ensure that forensic DNA technology reaches its full potential to solve crime, protect the innocent, and identify missing persons.

The 15-module *Officers of the Court* program covers a wide-range of topics dealing with forensic DNA analysis, including:

- The biology of DNA and key issues of how DNA is used to solve crime.
- The workings of a forensic laboratory and how to understand a DNA laboratory report.
- Statistics and population genetics.
- DNA analysis, including mitochondrial and short tandem repeat (STR) analysis.
- The collection of DNA from evidence and suspects.
- Victim issues, such as privacy considerations and testing procedures.
- Pretrial evidentiary issues.
- Trial presentation.
- The use of DNA in post-conviction cases.
- Emerging trends in DNA analysis.

Module 13, for example, discusses ways to make DNA evidence more comprehensible to jurors. It offers a video that shows an expert witness presenting her background and qualifications to a jury. There is guidance for formulating questions to a forensic DNA expert, including sample opening questions. There is also a discussion on the use of analogies to help jurors intelligently and fairly evaluate DNA evidence. And the module addresses pretrial preparation between attorney and expert to ensure that jurors receive the appropriate level of technical detail, including testimony on issues such as the significance of testing results and areas of potential cross-examination.

The President's DNA Initiative provides operational funding, laboratory capacity-building, training, and technical assistance to help ensure that forensic DNA technology reaches its full potential to solve crime, protect the innocent, and identify missing persons.

Another module in the training program discusses the framework within which states can conduct post-conviction DNA testing. For example, hair found at a crime scene that previously might have been identified only by microscopic analysis can now be tested using mitochondrial DNA analysis. In addition, recent technological advances now allow testing of smaller, limited, degraded, or mixed biological samples. This module also provides information on the existence, location, and condition of biologic evidence, and offers guidance on some of the legal and procedural issues involved in post-conviction DNA testing.

Looking to the future, module 15 examines emerging trends in DNA analysis and how these may affect the use of biologic evidence in the courtroom. For example, an increasing number of laboratories are automating DNA testing procedures to reduce cost, increase efficiency, and decrease the likelihood of human error.

Why Online Training?

Online tutorials—sometimes called “e-learning”—can decrease training costs for judges and public- and private-sector criminal lawyers. And, as legal professionals gain a greater understanding of DNA analysis—the most rapidly evolving scientific method of identification—plea bargains may

Because the forensic sciences are ever evolving—and particularly because the general public often misunderstands the application and utility of DNA evidence—judges and lawyers must increase their understanding of DNA technology and how it is used to prove guilt or innocence.

increase, leading to administrative cost savings. In fact, efficiencies may be realized beyond the courts, as more coordination occurs among requests for DNA testing, pretrial preparation, and expert testimony requirements.

This training program uses a multimedia approach: text, images, animations, audio, and video. Some of the Nation's top criminal

law, forensic science, and e-learning experts helped develop this training. Although it is designed primarily for prosecutors, defense lawyers, and judges, it is also an outstanding resource for victim advocates, investigators, law students, and other criminal justice professionals interested in this area.

Because the forensic sciences are ever evolving—and particularly because the general public often misunderstands the application and utility of DNA evidence—judges and lawyers must increase their understanding of DNA technology and how it is used to prove guilt or innocence. NIJ is committed to developing tools to help them meet that responsibility.

NCJ 216526

For More Information

- *Principles of Forensic DNA for Officers of the Court*, NCJ 212399, is available online at www.dna.gov/training/otc. A CD-ROM version can be ordered through the National Criminal Justice Reference Service (NCJRS) at www.ncjrs.gov.

Publications of Interest From NIJ

Communications Interoperability: Basics for Practitioners March 2006

This NIJ "In Short" fact sheet summarizes the obstacles public safety agencies face with communications interoperability. The two most common issues are frequency and equipment incompatibilities. It also discusses CommTech's solutions to overcome these problems and available products that can facilitate limited interoperability. This publication is available at www.ncjrs.gov/pdffiles1/nij/212978.pdf.

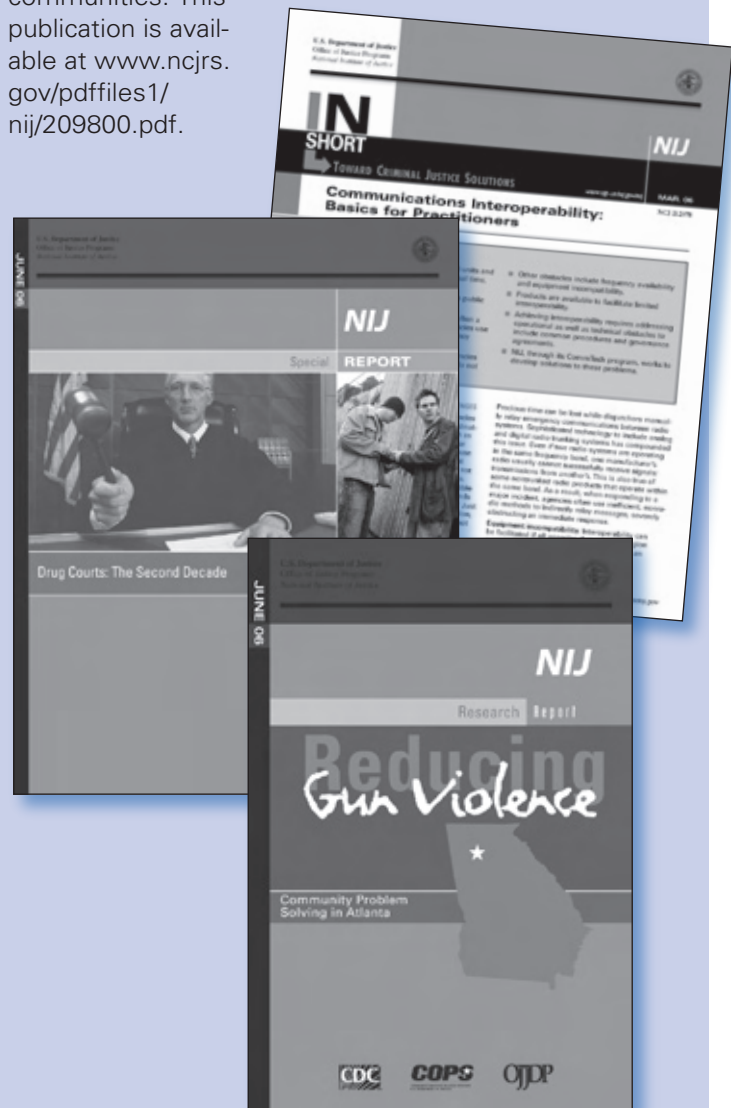
Drug Courts: The Second Decade June 2006

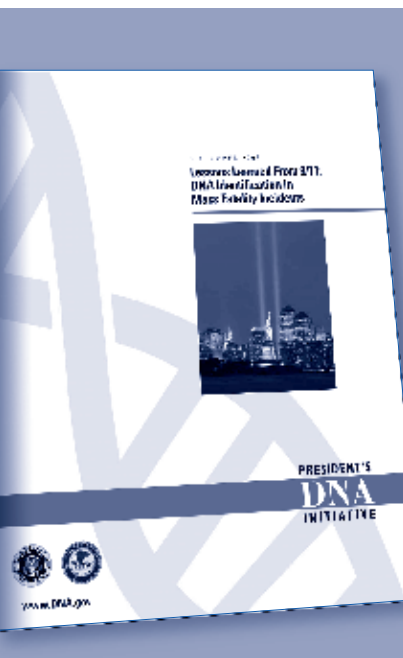
Introduced in the late 1980's, drug courts help reduce substance abuse and criminal behavior and free the court and correctional systems to handle other cases. They offer a structure that links supervision and treatment as an alternative to incarceration. As of December 2005, more than 1,500 drug courts operate in the United States and another 391 are planned. This NIJ Special Report presents findings from several recent studies that focus on the successful components of drug courts, such as how participant attributes affect program outcomes, the judge's role and relationship with participants, treatment issues, interventions for juveniles, and cost-benefit analyses. This publication is available at www.ncjrs.gov/pdffiles1/nij/211081.pdf.

Reducing Gun Violence: Community Problem Solving in Atlanta by Arthur L. Kellermann, Dawna Fuqua-Whitley, and Constance S. Parramore June 2006

The fifth report in NIJ's *Reducing Gun Violence* series examines the lessons learned from Atlanta's ambitious program to reduce juvenile gun violence. In the late 1990's, the

city adopted a problem-solving approach within the national program "Project PACT." Atlanta PACT formed strategic partnerships with Federal, State, and local law enforcement and community-based groups to break the chain of illegal events leading to juvenile gun violence. Some of the partnerships and strategies established endure today within Project Safe Neighborhoods. The report describes the program's methods and lessons for other communities. This publication is available at www.ncjrs.gov/pdffiles1/nij/209800.pdf.





Identifying Remains: Lessons Learned From 9/11

by Nancy Ritter

About the Author

Nancy Ritter is a writer/editor at the National Institute of Justice and Editor of the *NIJ Journal*.

Nothing in the history of mass fatality events prepared America's forensic community for the task of identifying those who died when terrorists attacked the World Trade Center in New York City on September 11, 2001. The number of victims, the condition of their remains, and the duration of the recovery effort made their identification the greatest forensic challenge ever undertaken in this country.

To assist in this monumental effort, NIJ brought together a group of experts to advise and support New York City's Office of the Chief Medical Examiner during the identification effort. The Kinship and Data Analysis Panel (KADAP), made recommendations on forensic technologies, policies, and procedures to help identify victims who perished in the World Trade Center. (See sidebar on p. 21, "What is the KADAP?")

Five years and thousands of man-hours later, NIJ has published the KADAP's report on its recommendations, *Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents*.¹ Although the report is written primarily for laboratory directors, it contains information useful to any official involved in preparing a comprehensive plan to identify victims of a mass fatality incident using forensic DNA analysis. The report includes an indepth look at:

- Assessing the magnitude of a DNA identification effort and acquiring the resources to respond.
- Collecting personal-item reference samples and biological samples from the victims' families.
- Establishing laboratory policies and procedures for DNA extraction, typing, and interpretation, and determining the statistical thresholds to be met for identification of commingled, degraded, or fragmented remains.

- Managing the laboratory's work, including sample tracking and chain-of-custody requirements, data management, technology, and quality assurance.
- Educating and informing victims' families, officials, the media, and the public.

How DNA Is Used to Make Identifications

DNA analysis is the gold standard for identifying human remains and may be the only available method, when other methods, such as birthmarks, dental records, or fingerprints are not

The number of victims of the September 11, 2001, World Trade Center attack, the condition of their remains, and the duration of the recovery effort made their identification the greatest forensic challenge ever undertaken in this country.

available. If sufficient DNA can be recovered, forensic DNA typing can identify biological samples—even when the human remains are fragmented and the DNA is degraded, as with the World Trade Center victims.

WHAT IS THE KADAP?

The idea of creating the Kinship and Data Analysis Panel (KADAP) to advise officials in the New York City medical examiner's office after the 9/11 attacks originated with W. Mark Dale, director of Forensic Services for the New York State Police. When Dale realized that the number of World Trade Center victims and the condition of their remains would require an unprecedented DNA-based identification effort, he asked the National Institute of Justice to create a "brain trust" of independent scientists to offer guidance in this monumental task.

"I knew we were facing enormous management challenges," Dale said. "The notion that we were to reassociate potentially hundreds of thousands of remains—let alone identify them by comparing their profiles to perhaps tens of thousands of kin and effects profiles—was beyond daunting. We needed human geneticists, statisticians, bioethicists, forensic DNA scientists/managers, genetic researchers, information technologists, database managers, and program managers—and we needed them *fast*."

The breadth of the combined experience of the KADAP members is stunning. The

panel was comprised of scientists from the following agencies and universities: the National Institutes of Health Human Genome Research Institute, the FBI, the National Center for Biotechnology Informatics, the National Institute of Standards and Technology, the Armed Forces Institute of Pathology, the New York State Police Department, the New York City Office of the Chief Medical Examiner, the University of Central Florida, Carleton University, Harvard University, Yale University, Indiana University, the University of North Texas, the University of California, Johns Hopkins University, and a number of private DNA laboratories.

Members of the private and public sectors also provided testimony to the panel that guided its recommendations. Early demonstrations of DNA matching software, developed for other mass fatality situations, were an important contribution. Input from the International Commission on Missing Persons in Bosnia, and the Royal Canadian Mounted Police, which shared a special computer program that was used in the World Trade Center identification effort, was also invaluable.

Everyone—the public, policymakers, and laboratory personnel—must understand the answer to the important question: “When are we finished?”

Identifications are made by comparing the DNA profile of reference samples with those from the human remains. The reference samples can be obtained from: (1) personal items used by the victim (a toothbrush, hairbrush, or razor); (2) banked biological samples (sperm or biopsy tissue from the victim); (3) biological relatives of the victim; and (4) human remains previously identified by other methods or other already-DNA-typed fragmented remains.

Often, however, the remains or the reference samples have severe limitations. For example, environmentally harsh conditions, such as those that occurred following the World Trade Center attacks, can limit the quantity and quality of recoverable DNA from the remains. There may also be insufficient personal items to serve as reference samples. For example, airline passengers often travel with their toothbrushes and hairbrushes, and these items can be lost or destroyed in a crash. Because families often travel together, there may also be a limited availability of kinship samples. Kinship samples may also be scarce because the victim has few living biological relatives or the relatives are unable or choose not to participate in the identification effort. The KADAP report discusses these contingencies and offers guidance to laboratories on how to deal with them.

Major Decisions Made Fast

Many critical management decisions are made within the first 48 hours of a mass disaster. To facilitate a plan of action for laboratory directors, the KADAP report contains a checklist of important questions,

such as: Who will the laboratory report to? Who is responsible for funding? How will the samples be collected and tracked? How many family reference collection kits are immediately available? Have procedures been established to handle incomplete data? Is staffing adequate for collection, accessioning, extraction, amplification, analysis, interpretation, reporting, quality control, family relations, and media relations? Can the laboratory handle the accumulation of a normal casework backlog while it works on the mass disaster identification effort? If so, how big can the backlog get?

By addressing many of these major questions, the KADAP report can help the Nation’s laboratories prepare a DNA identification plan. Among the issues to consider:

How important is DNA to the identification effort? The degree to which human remains are fragmented or degraded determines the importance of DNA analysis in a mass fatality identification effort. Intact body parts are often identifiable by less costly methods, such as X-ray, dental examination, or fingerprints. However, DNA analysis is the only viable method for identifying severely fragmented or degraded remains. Even when whole bodies are recovered, DNA analysis is still the best approach when dental records or verified body identification by friends or relatives is not an option.

Will every person or every fragment be identified? The answer to this question frames the scope of the entire identification effort. For example, after the 9/11 attacks, Rudy Giuliani, the mayor of New York City, directed the medical examiner to identify every fragment of human remains. If the goal is to identify all human remains—as opposed to every victim—the identification effort will take longer and be more costly. On the other hand, if the policy is to identify all the victims, the DNA identification effort would stop when the last victim is identified. This could mean that some

SAMPLE TRACKING AND MANAGEMENT

Information technology can be one of the most overlooked aspects of a DNA-based identification effort following a mass disaster. Advance planning for using information technology in sample tracking and management saves time, speeds identification, and improves testing reliability.

Without sophisticated software, the nearly 1,600 identifications made and nearly 20,000 human remains profiled in the World Trade Center identification effort would not have been possible. A laboratory responding to a mass fatality event must be prepared to track the physical location of each sample and the data associated with it through the entire identification process. The KADAP report considers sample accessioning, naming and numbering schemes, and advises how to handle the possibility that remains are commingled. The report also discusses matching and statistics software, and ways to organize, store,

and retrieve data; integrate different software systems; allow technical and administrative review of data; annotate problems and resolutions, report metrics; and track samples among partner laboratories.

Finally, the report explores the difficulties that can arise when working with reference samples, such as toothbrushes, razors, and medical biopsy specimens. A laboratory must keep in mind that bereft loved ones can inadvertently misidentify reference samples and misspell names or nicknames. Family members may also be mistaken in their belief that a missing relative was the only person to use a toothbrush: mixed DNA profiles will eliminate an item as a single-source reference. Other complications include assumed, but incorrect, parentage. The KADAP report discusses chain-of-custody documentation and how essential the managing and tracking of sample collection is to the identification process.

human remains would not be analyzed or returned to the families. Everyone—the public, policymakers, and laboratory personnel—must understand the answer to the important question: *“When are we finished?”*

What is the minimum fragment size that will be identified? The minimum fragment size to be analyzed must also be established at the beginning of the effort. From the laboratory’s perspective, the minimum fragment size (typically 1 to 10 centimeters) should be based on three criteria: (1) maximizing the probability that all victims are identified, (2) recognizing the emotional needs of the victims’ families and friends, and (3) providing forensically relevant information.

Laboratory officials must also establish policies on the number of testing attempts that will be made to identify the remains and the statistical threshold that must be met to report an identification. These decisions are fundamental to a laboratory’s strategic planning.

How long will the recovery effort last? The size and location of a mass fatality disaster also determines how long the DNA identification effort will take. Remains from an airline crash on land, for example, are generally collected in about 2 weeks. In contrast, remains from the World Trade Center were collected over 10 months.

Waiting until all remains and reference samples have been collected is the most effective and efficient approach from the laboratory's perspective. However, when the number of victims or fragmented remains is large, collecting all of samples before the identification process begins is usually not possible. Delaying the identification process may not be acceptable to the victims' families, the public, and officials, who expect the identification effort to begin immediately and proceed rapidly.

What DNA technologies will be used?

The laboratory must make a preliminary decision about what DNA technologies will be used. For example, can all identifications be made with standard forensic short tandem repeat markers²? If the samples are severely compromised, are additional analyses, such as single nucleotide polymorphisms³ or mitochondrial DNA, necessary? Longer recovery efforts usually result in more DNA degradation, which, in turn, affects technology choices.

Can the laboratory do the work?

Ultimately, the question of whether a laboratory has the capability and capacity to perform the identifications must be answered. To help laboratory managers assess this, the KADAP report contains an "Estimated DNA Analysis Workload Worksheet" that can be used to estimate the labor and materials required. The report also includes an extensive discussion on contracting with outside laboratories.

What is the funding source? State or local forensic laboratories are not likely to have sufficient funding for a large DNA identification effort. The KADAP report discusses how the selection of resources can impact the identification effort. For example, the Federal Emergency Management Agency (FEMA) is the primary source of Federal funding in a mass disaster. Although FEMA is generally prepared to support new equipment purchases, if the DNA identification effort is to be funded solely through State or local budgets, there could be limitations on what purchases will be authorized.

These financial considerations, in turn, influence decisions about minimum fragment size and retesting policies. Laboratory managers must make sure the medical examiner understands the fiscal impact on the laboratory's ability to make identifications.

Project Management

Many laboratory directors are seasoned practitioners but lack management experience. Skills in technical troubleshooting, case management, molecular biology, and population statistics are important in the day-to-day running of a forensic laboratory. Managing a mass fatality identification effort, however, requires skills in communications, risk management, and integrating non-DNA disciplines.

The KADAP report examines a laboratory's project management in a mass fatality situation from many perspectives, including sample accessioning, analysis and tracking, quality control, information technology, human resources, media relations, family coordination, and procuring equipment, supplies, and services.

The report also offers guidance on the importance of establishing a procedure for handling requests for special analyses. In the World Trade Center effort, for example, the fire and police departments frequently asked the laboratory to reprioritize the testing of victim remains. Requests for expedited analyses could also occur later in an identification effort if, for example, new remains were recovered or more useful personal items or biological reference samples became available.

A laboratory manager may also encounter tremendous staffing challenges. The World Trade Center effort demonstrates that consultants and outside vendors can be hired to offer special expertise and to increase a laboratory's capacity to handle a large DNA analysis effort. The KADAP report discusses a variety of staffing issues (e.g., working with volunteers, confidentiality

concerns, and mental health and morale) that could arise in a mass disaster identification response.

Managing Expectations

Faced with managing a DNA-based identification effort after a mass fatality disaster, a laboratory is likely to encounter a host of new stakeholders. Although all of them seek the same outcomes—the maximum number of identifications and the most remains possible returned to families—their priorities may not be the same as those of the laboratory. Public officials might be focused on the speed of the process, whereas the laboratory’s primary concern is the quality of the collection and analyses. Although these goals are not mutually exclusive, they can occasionally clash.

“Striking the balance [between speed and accuracy] was one of the greatest challenges in the World Trade Center effort,” said KADAP member Thomas Parsons of the Armed Forces Institute of Pathology. “Pressure to establish working guidelines for the rapid reporting of results, while maintaining a high threshold to reduce the probability of misidentifications, was a constant concern—one that should be paramount throughout any identification effort.”

Laboratory directors should assume that the public—including public officials and the media—knows little about the realities of DNA analysis. To minimize the potential for misunderstandings and even greater emotional upheaval, the report advises that a laboratory director be prepared to answer questions such as:

- How many victims have been identified?
- Have you identified the terrorists?
- How much time until the work is finished? Why is it taking so long?
- Will you be able to identify everyone, and, if not, why not?
- What is the condition of the remains?

“Striking the balance [between speed and accuracy] was one of the greatest challenges in the World Trade Center effort,” said KADAP member Thomas Parsons of the Armed Forces Institute of Pathology.

“Pressure to establish working guidelines for the rapid reporting of results, while maintaining a high threshold to reduce the probability of misidentifications, was a constant concern—one that should be paramount throughout any identification effort.”

- What is the mood in the laboratory? How is your staff holding up under the pressure?

The Family-Laboratory Relationship

Working with the families of victims of a mass fatality incident is likely to be foreign to most laboratory directors. The KADAP report discusses how the formation of family assistance centers and family hotlines can help in this regard.

The report also facilitates one of the most important aspects of a DNA-based identification effort—the collection of reference samples from the victims’ families. Currently, no standards govern the collection of personal items and kinship reference samples. To assist in this effort, the KADAP report includes three sample documents designed by the panel: a “Personal Items Submission Form,” a “Family and/or Donor Reference Collection Form,” and a “Family Tree Form.”

Grieving family members often may not know why they are being asked to provide a personal item that belonged to their loved one, or why the laboratory is requesting a DNA sample. They may not understand, for example, the difference between a biological relative and someone who is called “aunt,” but is not actually related. To help explain the DNA identification process to the general public, the KADAP report contains an NIJ brochure that was distributed to victims’ families after the 9/11 attacks.⁴

Preparing a Plan

For the Nation’s forensic laboratories, the primary lesson of 9/11 is clear: every jurisdiction—large and small, urban and rural—must have a plan for identifying mass disaster victims. Even before this report was published, NIJ was able to use the work of the KADAP to assist officials involved in identifying the victims of the 2004 Southeast Asia tsunami and Hurricane Katrina, a disaster that revealed how any State or municipality can be overwhelmed by the operational requirements of responding to a mass fatality event.

When NIJ released the report, Glenn Schmitt, NIJ’s acting director, encouraged every jurisdiction to carefully consider the guidance in the KADAP report. “The families of the victims of the next mass fatality disaster, indeed, the entire Nation, will need their public officials to be prepared,” he said. “This guide will help us accomplish that mission.”

Notes

1. The report can be downloaded at www.massfatality.dna.gov. To order a hard copy or CD of the report, call 1-800-851-3420 or visit www.massfatality.dna.gov. The KADAP report is designed to augment another NIJ publication, *Mass Fatality Incidents: A Guide for Human Forensic Identification* (www.ojp.usdoj.gov/nij/pubs-sum/199758.htm), which is also contained on the CD.
2. Short tandem repeats—repeating sequences of DNA nucleotides (that is, A, T, C, or G)—are called markers in DNA testing.
3. A single nucleotide polymorphism (SNP) occurs when a single nucleotide—that is, A, T, C, or G—in a DNA sequence differs between individuals or between paired chromosomes in an individual. Because SNPs are inherited and do not change much from generation to generation, they can be used to determine the level of a genetic relationship between individuals.
4. *Identifying Victims Using DNA: A Guide for Families*, is available at www.ncjrs.gov/pdffiles1/nij/209493.pdf and is contained (in English or Spanish) on the CD mentioned in note 1 above.

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