



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

by Nancy Ritter

About the Author

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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.

NCJ 216523

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.hsc.unt.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*

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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.