CONNECTING THE DOTS: DATA ANALYSIS IDENTIFIES SERIAL KILLINGS IN FBI COMPUTER FILES

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CONNECTING THE DOTS:
Shoe Leather, Data Analysis help Scripps Howard Team Identify Possible Serial Killings

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ABSTRACT
Journalists at Scripps Howard News Service based in Washington, DC, developed a computer algorithm that can identify clusters of serial murders within the FBI's Supplementary Homicide Report, an open source database of U.S. homicides. Officials in two police jurisdictions opened new inquiries in "cold case" homicides as a result of the findings of the algorithm.

INTRODUCTION
America does a poor job tracking murder victims or finding their killers.

In many parts of the United States, it is statistically unlikely for killers to be caught. And those retail practitioners of the homicidal art – serial killers – often go undetected among the 6,000 unsolved murders each year.

And yet, Scripps Howard News Service proved it's possible for journalists and amateur detectives to spot likely victims of serial murder amid police computer files.

Editors at Scripps Howard News Service based in Washington, D.C., committed to conduct a yearlong investigation into unsolved murders. The project was inspired when bureau reporters began playing with a copy of the FBI's annual Supplementary Homicide Report (SHR) available at IRE's online database library. For years, we wondered if it was possible to identify serial murders among FBI computer files.

Officials at the FBI's Criminal Justice Information Service Division in Clarksburg, W. Va., agreed to provide complete copies of the "Return A" of the Uniform Crime Report going back to 1965. This report gives the monthly number of homicides investigated and homicide arrests made by each police department. The FBI also agreed to give a complete copy of the SHR back to 1980, providing valuable information on victims' age, race, sex, method of killing and circumstances surrounding the murder. Demographic information on the killers, when known, is also provided.

What we found was alarming.

According to official Justice Department estimates, slightly more than 565,000 Americans were murdered from Jan. 1, 1980 through Dec. 31, 2008. But only 510,000 murders are recorded in the FBI's completely voluntary SHR program. Scripps Howard tried to close that gap through use of local Freedom of Information laws. We successfully obtained records of 15,300 unreported murders from Florida and the District of Columbia. But other departments, including the state of Illinois, refused our FOIA requests on the grounds that the information we sought does not exist or would be too laborious to assemble.

Despite our failures, we improved the SHR reporting rate from about 90 percent to 93 percent. (Go to www.scrippsnews.com/projects/serial-killers to download either SPSS or tab-delimited formats of our enhanced dataset. Cases obtained through Scripps Howard's FOIA requests are clearly labeled.)

When we began to publish results in May 2010, we focused on the erratic rate at which homicides are solved. The clearance rate varies dramatically both by time and by geography. Despite what we see on television crime dramas, homicides have become much less likely to be solved in recent years than they were in the 1960s. Back in the day, police reported making an arrest in 90 percent of their killings. More recently, clearance rates have hovered in the mid 60 percent range.

Even more dramatic are the geographic differences. In 2008, police solved only 35 percent of killings in Chicago, 22 percent in New Orleans and 21 percent in Detroit. Yet authorities reported making arrests in 75 percent of the killings in Philadelphia, 92 percent in Denver and 94 percent in San Diego.

Scripps Howard decided to study the rate of change within police departments over time, thus sidestepping Justice Department warnings against intra-department rankings because of varying procedures and crime conditions. We constructed a nine-year clearance average for homicides committed from 2000 onward, and a 10-year average for the 1990s.
The police departments with the greatest improvement in their clearance rates were: Durham, N.C., Polk County, Fla., and Santa Ana, Calif. The chiefs of police or sheriff in each jurisdiction were happy to provide interesting narratives to how they reversed dismal clearance rates into stellar performances.

"This doesn't happen in a vacuum," said Durham Police Chief Jose Lopez, where clearance rates rose from an average of 39 percent in the 1990s to 78 percent since 2000 – the biggest improvement in the nation.

Durham generally follows most of the "best practices" guidelines proposed by Justice Department studies. But the city also has developed a unique "Community Response" program to overcome reluctant witnesses in high-crime neighborhoods.

"We will canvass door-to-door to see what information we can get. If necessary, we'll get up to 100 officers knocking on doors. It's civilians, police, even elected officials who come out so we can get more witnesses – witnesses we otherwise would never have gotten. And that builds more trust throughout the neighborhoods."

Sadly, departments like Durham's are the exception.

The homicide clearance rate fell in 63 of the nation's 100 largest departments, according of the Scripps Howard study. The worst suffered more than a 30-percentage point tumble in Dayton, Ohio, and Flint, Mich. Both cities experienced severe cutbacks in sworn police officers, reductions necessitated by declining tax revenue bases in the heart of America's industrially eroding rustbelt.

"Witnesses don't want to cooperate with police," complained Flint Police Chief Alvern Lock. "If I had a magic wand, I'd ask for more money so I could hire more officers. We just need more of everything."

The conclusion we drew from the initial Scripps Howard study was that failures in homicide solution rates are ultimately a failure of political will by mayors and police chiefs. When murder is made a priority, the clearance rates improve. The most spectacular example of that was in Philadelphia, where Mayor Michael Nutter declared a "crime emergency" in 2006 after homicide clearance rates had fallen to an anemic 56 percent. He hired former Washington, D.C., Chief Charles Ramsey as police commissioner,

who established results-based oversight of homicide cases. The murder clearance rate rose to 75 percent the next year and has held at that level.

The Scripps study found that since 1980, nearly 185,000 murders went unsolved. These killings have become growing mountains of cold cases that bewilder many major police departments. "I'm sure there are serial killers in that pile," concluded Sgt. Larry Lewis of the Dallas Cold Case Homicide Unit. "But I'm trying to figure out a way to find them."

So can journalists use FBI computer files to identify likely serial killings?

Scripps Howard reporters decided to use well-documented cases of serial murder to test this question. Probably the worst serial killer active in the United States since 1980 was "Green River Killer" Gary Leon Ridgway, who strangled 48 young women and teenage girls in the greater Seattle area. We tagged those killings in our database and began experimenting with methods to identify them statistically.

Scripps Howard concentrated on female victims because the FBI, at the wire service's request, released information from its Violent Criminal Apprehension Program database of 60,000 homicides that showed more than 70 percent of known serial murders were of women.

The University of Missouri's Journalism School offered Scripps Howard a graduate student intern, a talented computer researcher named Elizabeth Lucas. She was quickly pulled into the project, laboriously producing more than 100 spreadsheets calculating female homicide solution rates by state, county and metropolitan areas. She documented dozens of methods that were only moderately successful in flagging the victims of Ridgway and other known serial killers.

A process dangerously close to trial-and-error produced a method that correctly flagged 32 of Ridgway's known 48 victims. Homicide victims were assembled into clusters according to their sex, age group and method of killing. Using SPSS, we aggregated these clusters, calculated the rate of clearance for each group, then outputted the summaries into an Excel spreadsheet.

What we got back was amazing. We found 161 clusters in which 75 percent or more of the murders of women were unsolved at the time they were reported to the FBI. We sorted according to the number of cases, and then selected 10 cities that appeared to have large numbers of unsolved murders of women of similar age who were killed through similar methods.

"Your method is fine, but it certainly underestimates the true number of serial killings," said criminologist Jack Levin, co-director of the Brudnick Center on Violence and Conflict at Northeastern University and a nationally prominent scholar of serial and mass murder.

We spent nearly three months negotiating, cajoling and outright pleading with police in 10 major cities to review their records against the possibility that we'd found specific cases of serial murder. Scripps Howard wrote letters to authorities, even naming names of victims when we were able to identify them from published newspaper accounts. (The SHR does not gather victim's names, but provides enough information to make solid identification fairly easy.)

"We've determined that Gary, Indiana, has an elevated number of unsolved murders of women who were strangled in recent years," we wrote to Indiana authorities. "Broadly, we see two possible patterns. In recent years, several women have been strangled in their homes. In at least two cases, a fire was set after the women were killed. Also, starting in the 1990s, we've seen several women who were found strangled in or near abandoned buildings."

The Gary Police Department, to this day, has refused to speak to us about these cases. But the letter produced an immediate response from the Lake County, Ind., Coroner's Office.

"I remember we had three of them, all women, who were strangled," said Deputy Coroner Jackie DeChantal. "We couldn't get anyone else to say that they were connected."

The coroner ordered an investigation and added three more suspicious cases to the 14 identified by Scripps Howard. The letters also brought an immediate response from Youngstown, Ohio, officials who conceded their investigators believed in the 1990s that they were hunting a serial killer who was never disclosed to the public.

"We thought we had a serial murderer running around. Yes, we definitely thought we had one," said homicide Capt. Rod Foley.
Foley renewed the investigation, trying to obtain DNA from aging rape kits on evidence shelves in Youngstown and neighboring departments. Both investigations in Indiana and Ohio are ongoing.

Police confirmed in seven of the 10 cities that Scripps Howard's statistical method had correctly identified serial murder victims in their community. (The SPSS syntax command file used in this study also is available online at our website.)

Scripps Howard also found that it's common for police to stay mum about suspected serial murders. Although the FBI recommends disclosure – especially if the killer has a clear pattern of preference for victims – it always defers to local police to decide whether to "go public" with serial killings.

Our reporters concluded it's a wise policy for television and newspaper police reporters to regularly ask local authorities if they have active investigations into likely serial murder.

Scripps Howard has produced two online databases for this project. The first, at www.scrippsnews.com/projects/murdermysteries, allows users to track murder solution rates in every county and at every police department. The other site, www.scrippsnews.come/projects/serial-killers, allows users to look for elevated rates of unsolved murder according to victimology. We've posted the raw SHR data at this second site.

A team of researchers from the University of Tennessee – under the supervision of computer science professor David Icove, a former member of the FBI's Behavioral Analysis Unit – asked for and was given complete copies of all datasets Scripps Howard assembled and the methods we used to identify potential serial murders. The team will seek to replicate and evaluate the methods.

"It is a fine example of how analysis of open source information can produce significant leads in cold cases," Icove said. "We will be putting together a team to look at these data and will report back as to our results."

(Reporter Thomas Hargrove is willing to answer questions about this project, the online databases or the FBI datasets. He can be reached at hargrovet@shns.com or 202-408-2703.)