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The Missing Missing

Toward a Quantification of Serial Murder Victimization in the United States

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Although early attempts to estimate the number of serial murder victims in the United States varied greatly and were exaggerated, current estimates may actually underestimate the number of serial murder victims. This study provides extrapolation from existing databases including missing persons, unidentified dead, and misidentified dead to estimate uncounted serial murder victims. In addition to providing lower and upper estimates of possible victims from these sources, this article also provides a methodology for counting “the missing missing”—missing persons who were never reported as missing and some of whom may be serial murder victims. By counting various sources of possible hidden serial murder victims, the addition of a lower estimate of 182 and an upper estimate of 1,832 additional annual serial murder victims in the United States is suggested.

Keywords: *serial homicide victims; missing missing; unidentified dead; missing persons; extrapolation*

Early attempts to estimate the annual number of serial murder victims in the United States greatly varied (Fox & Levin, 1985; Holmes & DeBurger, 1988; Kiger, 1990). Kiger (1990) noted that the most extreme estimates of the number of serial murder victims were as high as 6,000 victims a year with claims of as many as 500 active annual killers during the mid to late 1980s. By 1990, scholars suggested that the incidence of serial murder was overestimated and that the United States was spending an extraordinary amount of money and attention on what may have constituted as little as 1% of total annual homicides (Kiger, 1990).

Jenkins (2005) suggested the exaggerated magnitude of serial murders in the United States resulted from several factors. When apprehended, serial killers (e.g., Henry Lee Lucas) claimed to have hundreds of victims when in fact they had far fewer (Egger, 2002; Fox & Levin, 2005).¹ There was also confusion about differences between stranger homicides where the identity of the killer was known to have been a stranger to the victim and unknown homicides where the identity of the

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offender, and thus the relationship with the victim, was unknown (Kiger, 1990). It was believed that most stranger homicides were committed by serial murderers and that many, if not most, of the unknown offender homicides might be serial murders. There was no evidence to suggest that either was the case (Kiger, 1990). Political agendas also may have influenced the exaggeration of serial murder. The FBI wanted its Behavioral Science Unit to have authority over serial murders and wanted to expand federal authority to other serial crimes such as arson and rape; feminists drew on serial murder to highlight the victimization of women; get-tough-on-crime and death-penalty advocates used the heinous nature of serial murder to call for stricter sentences; religious groups used serial homicides as a warning about the evils of Satanism; and all forms of media made money from the public's interest in the crime (Jenkins, 2005).

More recent research suggests far fewer serial murder offenders and victims. Hickey (2004) suggested that there may be 30 to 40 active and unapprehended serial killers at any given time (though it is unclear whether this estimate includes cases carried over from previous years or only newly discovered cases). Although exaggerated estimates from the 1980s have tempered, there is still variation in estimated annual numbers of offenders and victims. Some of the divergence reflects a lack of clarity regarding whether estimates refer to apprehended killers, known but unapprehended killers, or suspected but unapprehended serial killers. The discovery of serial killers who have been active over a number of years does not typically result in additions to Uniform Crime Reports or Supplementary Homicide Reports from years or decades past (see Kiger, 1990). The detection of a nurse who has murdered a patient generally does not result in a review of the hundreds of past patient deaths under her care. In addition, how do we count an unidentified dead body whose cause of death may be homicide? How do we categorize a missing person whose disappearance is likely attributed to foul play? The true number of serial murder victims in the United States is a function of what we know—apprehended killers and strongly suspected serial murder cases—as well as what we do not know—serial murder cases that for one reason or another are off the radar of police, coroners, medical examiners, and other officials. The exaggeration and hype of the 1980s have been replaced by more reasonable estimates, but we may yet be undercounting the number of serial murder victims in the United States by discounting what we do not know. Virtually all estimates neglect the types of killers and victims that are always partially discounted; the serial killer who murders victims who have never been reported missing; the serial killer who disposes of bodies in such a way that when discovered the cause of death and victim identity are unknown; and killers who choose marginal victim populations such as illegal aliens, prostitutes, and the homeless (populations known as the *less-dead*; see Egger, 2002). Estimates also neglect deaths we do not realize are homicides, much less part of a series.

As Ritter (2002) reminded us, it is important to establish the number of active serial killers and their victims so that we do not just publish the estimates, have the debate about how many exist, and walk away. Our primary goal in quantifying this

phenomenon should be to aid the police in prevention and intervention. Improved surveillance of a phenomenon is one of the first steps toward effective public policy. By neglecting certain types of homicides (and other deaths) and ignoring some victim pools, this article argues that we may be underestimating the number of serial murder victims in the United States and masking an even darker figure of serial murder. The argument is not that the phenomenon of serial murder is increasing, rather, it is that we have always missed some victims in our counts.

The present investigation will review previous estimates of the number of serial murder victims in the United States; analyze missing persons, unidentified dead, and misidentified dead data for possible serial murder victims; and provide a methodology for creating a more valid estimate of the number of serial murder victims in the United States, paying particular attention to overlooked, special populations. The purpose of this endeavor is to examine the various sources of data where serial murder victims may be concealed and provide estimates of the annual numbers of possible uncounted victims. Careful examination of these populations suggests that there may be hundreds of uncounted serial murder victims each year in the United States. Some of the assumptions and extrapolations that constitute the contribution of this article may be subject to debate, but the intent of the article is to spur expanded research on the number of serial murder victims in the United States.

Doing the Math

To establish a reliable number of annual serial murder victims in the United States, some scholars have attempted to establish the average active period for a serial killer and how many victims they have in a year, a month, or a week. Hickey (2004) suggested the average contemporary female serial killer kills for 9 years and averages 7 to 9 total victims. However, the variation in the length of the active period is significant. For example, Hickey described one female who killed for 34 years and others who were active for only a few months. Male serial killers averaged 6 to 11 victims over a similar period (9 years). Based on Hickey's (2004) estimates, 40 active killers per year averaging less than 1 victim a year would generate a victim count of less than 40 victims a year, and this is used as Hickey's lower estimate with 63 victims a year (based on 1975 to 2004 known serial murder offenders) as the upper estimate of the number of serial murder victims a year. Using the FBI serial killer database covering the years 1977 to 1992, Egger (2003) found an average of 13 known serial killers a year and an average of 67 victims a year. Fox and Levin (2005) counted the number of killers by decade, and for the 1980s they counted 150 serial killers with 1,100 to 1,700 total victims for an average of about 120 to 180 known serial murder victims in the United States each year.

The variation in victim counts is significant and given the relatively small base numbers of 40 or even 180 victims a year, missing cases with large victim counts

could have a significant proportionate impact. Contrary to Hickey (2004), several cases illustrate a significant trend toward more than 1 victim annually. From 1979 to 1981, Wayne Williams, who was active approximately 22 months, likely had as many as 30 victims, or 1.4 victims, a month; Eileen Wuornos was active a little over a year and had 7 victims, or 1 victim approximately every 2 months; and Orville Lynn Majors was active approximately 24 months and had a minimum of 70 victims and possibly as many as 160 victims (3 to 7 victims a month).² John Wayne Gacy killed 33 victims in 6 years, approximately 5 victims annually. Guillen (2007) noted that, at his peak, Gary Ridgway, the Green River Killer, was killing 4 to 5 women a month. Moreover, recent research suggests that many United States medical murderers average 2 victims a month (Fox, Levin, & Quinet, 2005). Recent lists of United States serial killers find that as many as 17% are nurses (Stark, Paterson, Henderson, Kidd, & Godwin, 1997). In contrast to male killers, Hickey noted that approximately one third of female killers are place-specific.³ Given the discovery of significant medical victim counts it is possible we are underestimating the occurrence of place-specific, institutional killers. In addition, focusing heavily on serial homicides known to have large counts of certain types of victims such as prostitutes creates an overemphasis on the male sexual serial killer—not the female serial killers who choose victims less likely to be detected as homicides (children, spouses, and patients) or the serial killer, male or female, who chooses victims that are never found, never missed, or never recognized as homicide victims.

The number of active killers is, in part, a function of the average length of activity up to detection (i.e., finding the body). But what if you never find the body? And what if no one is looking because no one has ever reported the victim missing? What if we find bodies in clusters that may have been put there over a long period of time (e.g., Gary Ridgway, the Green River Killer)? Do we attribute all of those homicides to the year of body discovery? Recent media coverage about serial murder cases involving significant numbers of missing persons and unidentified dead, the detection of killers who were active for decades, and Ritter's (2002) challenge to conduct policy-relevant research suggest that we should revisit current estimates to more accurately estimate the annual numbers of serial homicide victims and offenders. Although early myths contributed to exaggerations of the risk of being a victim of serial murder, more recent myths may contribute to an underestimate of the risk for certain populations. To accurately reevaluate annual serial homicide numbers, we must first look for the hidden victims.

Missing Persons as Uncounted Serial Murder Victims

The important link between missing persons and serial murder victimization can be illustrated by a number of cases. Herbert Baumeister of Indiana killed at least 16 victims in 16 years. Most of his victims were reported as missing. Although this case

was eventually solved by police diligence, there was an initial reticence to create a task force and declare a possible serial killer at large. This was in part because missing victims were gay males, many of whom were known hustlers (and consequently more transient). The delay was not because these victims were any less of a priority but rather because of the impression that “these guys come up missing all of the time . . . same as with prostitutes” (Indianapolis Police Department [IPD], interviews of missing persons detectives, personal communication, June 2005). Research suggests that, indeed, prostitutes are a more transient population. A survey of prostitutes found that many prostitutes do not have households; 34% to 46% of prostitutes surveyed did not live in a household but rather stayed in hotels, motels, halfway houses, and homeless shelters (Potterat et al., 2004). Police who work missing persons cases suggest the reasons for the transient lifestyle of prostitutes and hustlers are numerous—eluding pimps and court dates, time in jail, and multiple-city work circuits (e.g., Indianapolis prostitutes will also work in Cincinnati and Louisville; IPD, 2005).

Potterat and colleagues (2004) noted that the leading cause of death for prostitutes is homicide with a homicide rate for prostitutes at 229 per 100,000. Most prostitute murders (64%) were committed by clients, as illustrated by the cases of some serial killers such as Gary Ridgway, Robert Pickton, and Robert Lee Yates. They demonstrate that one client can kill many women, thereby accounting for a significant portion of the homicides in a cohort. Depending on the cohort and decade, murder accounted for 29% to 100% of all prostitute deaths (Potterat et al., 2004). Although most prostitute homicides are not serial killer homicides, there are many serial murder cases documented in the literature with prostitute victims. Egger (2003) suggested that as many as 78% of all female serial murder victims are prostitutes. Although Egger documented several active serial murder cases with prostitute victims, there are no other claims in the serial murder research that three fourths of female victims are prostitutes. Until there is replication of this finding, it should be treated with some caution.⁴

A recent interview of serial killer Keith Hunter Jespersen, the Happy Face Killer, suggested that it is not only a transient victim pool that makes these murders difficult to trace. “I had a transient lifestyle—they were victimized because they were in my lifestyle” (Kamb, 2003). Jespersen, a long-haul truck driver, provided great detail about the extent to which he selected certain types of victims and hid their bodies in remote places so as to remain undetected—he understood the nature of missing persons and unidentified dead investigations, and took pride in the fact that he had been killing for a year before any of his bodies were discovered. Jespersen claimed to have 160 victims in multiple states and was legally tied to eight murders in five states (Kamb, 2003). Part of the risk for transient populations such as prostitutes, hustlers, runaways, and the homeless is their exposure to transient lifestyles.

In addition to the evidence that certain populations of people are more transient and therefore less likely to be missed, interviews with police and recent research indicate several reasons for reluctance to initiate missing persons cases (IPD, 2005). First, a missing person case is not a criminal case (Olsen & Kamb, 2003). Because

the majority of missing person investigations are eventually resolved (e.g., the missing person comes home or is found), these cases may not be viewed as important assignments for police officers. Solving runaway cases is not the trajectory to promotion in a police department. The politics of missing person investigations also affect their likelihood of investigation. Several cases illustrate a difference in the amount of time it takes to get a missing person investigation initiated although, in most jurisdictions, it is no longer true that you must wait 24 hours to file a missing adult report. In addition to delays in the initiation of missing person (who are presumed to still be alive) investigations, jurisdictions are slow to initiate serial murder investigations, even when there are bodies discovered that should serve as catalysts. However, some serial killers are adept at hiding their victims—Gary Ridgway had clusters of victims in burial sites holding as many as six victims (Guillen, 2007). Most of Ridgway's known victims (more than 60 women) were killed in and around Auburn, Washington, from 1983 to 2003 (Guillen, 2007; Rule, 2004). Many of these victims were not reported as missing in a timely fashion or reported missing at all.

Quantifying the Missing

How many missing persons are there? The answer depends on our definition of missing. Missing persons includes a number of different categories including family abducted, stranger abducted, throwaway, kidnapped, voluntarily missing, involuntarily missing, and short- and long-term missing.

According to the FBI, all categories combined, there were 840,279 adult and child missing person reports filed in 2004. Of these cases, 85% to 90% were missing juveniles, and most cases were eventually resolved (National Crime Information Center [NCIC], 2005). Although in excess of 800,000 missing persons reports will be filed each year, only a subset of those are active cases at any given time. According to NCIC statistics, there are currently 106,097 (juvenile and adult) active (unresolved) missing persons cases in the United States (T. Matthews, personal communication, October 21, 2005). Of the 106,097 active missing persons cases, 47,633 (45%) are adults. Of these, 3,598 (8%) were missing less than 30 days, 2,850 (6%) were missing from 30 to 60 days, 1,850 (4%) were missing 61 to 90 days, 8,743 (18%) were missing 91 to 364 days, and 30,622 (64%) adults were missing for 1 year or more (NCIC, 2004). Thus, the majority of active adult missing persons have been missing for more than 1 year.

The gender breakdown of missing persons statistics is also noteworthy—it looks more like the gender ratio of serial murder victims (65% female) as described by Egger (2003) rather than of overall homicide victims. Current statistics suggest an overall United States homicide victim gender split of 25% female and 75% male (Fox, 2004). The gender split for missing adults is nearly 50-50. Missing persons records for the state of Washington (long considered a model state for tracking unidentified dead and missing persons) were carefully scrutinized and analyzed by the

Seattle Post-Intelligencer and showed a gender split of 40% male and 60% female (Olsen, 2003). Of the 47,633 missing adults in the NCIC database, 25,322 or 53% are males, and 22,338 or 47% are females. The NCIC gender ratio changes depending on the age group. Of missing adults ages 18 to 21, only 35% are male; for ages 22 to 29, 45% are male; for ages 30 to 39, 56% are male; and this trend continues as the older the age group, the more likely that the missing are males (NCIC, 2004). The overrepresentation of females as missing persons is in the age categories most associated with prostitution (Potterat, Woodhouse, Muth, & Muth, 1990). If long-term missing persons are a potential pool of serial murder victims and the missing are 47% to 60% female, then the "real" homicide victim gender ratio might not be 3 to 1.

There is much less detail available on the characteristics of missing juveniles in the United States. Of the 106,097 missing persons in the United States, 55,988 (53%) are juveniles, 60% of whom are female, similar to the adult gender ratio. Eighty-nine percent of the missing juveniles are 13 to 17 years of age (NCIC, 2004).

In the recent Washington State analysis of missing persons statistics, 130 (20%) of the 600 missing persons were presumed victims of homicide/foul play. Of the 130 suspected homicide/foul play cases, as many as 20 (15%) were suspected serial murder victims (Olsen & Kamb, 2003). Applying the Washington formula to national NCIC missing statistics, 20,000 (20%) of the 100,000 missing persons in the United States could actually be homicide victims yet to be found, with as many as 3,000 (15%) of those being serial homicide victims.⁵ More conservatively, if even 5% of the missing persons who may in fact be homicide victims are victims of serial murderers, this pool alone would generate an additional 100 to 200 serial murder victims each year. Table 1 presents reworked estimates using data transformations from various sources including missing persons.

Much has been written about the state of missing persons recordkeeping (Olsen & Kamb, 2003). Records are incomplete, closed without cause, and not closed when the person is found. Although Washington's (and most other states') law requires a dental records search if the person is missing for 30 days, there is a 60%-plus rate of non-compliance with this law. Many missing persons cases are not entered into any database and most cases are cleared within a month. Some of these clearances are not because of face-to-face contact with the missing, but rather public records, credit card use, or sightings by someone. The Washington investigation revealed that, over time, 1 in 10 cases is lost or destroyed (and 100 of the 700 cases still active with state police could not be accounted for in any local agency), suggesting that the numbers of the long-term missing may be underestimated by at least 10% (Olsen & Kamb, 2003). If all of these problems exist in a state recognized for its progressive missing persons system, one can only speculate about the condition of missing persons records in other states.

Given the number of high-profile, long-term serial murder cases (e.g., the Green River Killer) in the state of Washington, some suggest that these state records may actually be some of the best in the United States. Using the state of Washington missing persons findings as the best available model for extrapolating to the United States may be a problem if there is something different about the number and type

Table 1
Annual Estimates of Uncounted Serial Murder Victims in the United States:
Reworked Estimates From Data Transformations

Data Source	Lower Estimate	Upper Estimate	Formula—Sources of Data Transformations
Missing persons	100-200	300-600	Application of the Washington findings—20% of missing as homicide victims, 15% of those as serial murder victims (5% for lower estimate) divided by 5-year and 10-year accumulations
Missing missing persons	6 (Hickman, Hughes, Strom, and Roper-Miller 2007) 11 (NCIC, 2005)	19-29 (Fox & Levin, 2005)	Extrapolating from known victim counts for female prostitutes only
Missing foster children	14	23	Application of Washington findings (70 by 3- and 5-year divisions)
Unidentified dead ^a			Washington formula applied to
NCIC	12	18	NCIC (2006) and BJS survey figures
BJS	27	40	(Hickman et al., 2007) and NCIC
Matthews	24-36	120-180	extrapolations from Matthews (2006), by 10-year and 15-year divisions
Misidentified dead			
Medical murder	50-100	500-1,000	500-1,000 from Fox, Levin, and Quinet (2005), 10% (50-100) as very low lower estimate
Total	182-361	860-1,832	

Note: NCIC = National Crime Information Center; BJS = Bureau of Justice Statistics.

^aOnly one of these figures should be used in the total as either the NCIC, BJS, or Matthews number is the most accurate.

of missing persons in Washington as opposed to other states. Although each state's distribution of missing persons is likely a function of the race, gender, and age distribution of the population of that state, there is no evidence to suggest that the patterns of serial murder vary by state. Hickey (2004) found the likelihood of serial murder to be a function primarily of that state's population, and other research finds that, although there may be a Western effect in the distribution of serial homicide (with those states having more cases than would be expected as a function of the population), there is nothing unique about the Northwest (Rossmo, 2004). So despite the Green River Killer, Ted Bundy, and other high-profile cases, no research thus far finds any unique properties in the state of Washington. Hickey ranked states according to the number of serial murder cases from 1800 to 2004 and found that the state of Washington had 6 to 19 cases of serial murder (as did 11 other states). California had 60 known cases during the same time period; a second tier of states—Florida, Illinois, New York, and Texas—had 20 to 30 cases. Thus it appears that the number of serial murder cases

in the state of Washington falls somewhere in the median range and, thus, this state may provide a reasonable source from which to extrapolate conservatively.

The Missing Missing

The most successful serial killers know to select the unmissed as victims if they intend to kill for an extended period of time. How many people are missing but have never been reported as missing? One way to get at this number may be to do an analysis of serial murder cases to determine how many of the victims were missing persons never reported as missing, or were reported as missing with the case having been prematurely or incorrectly closed or purged.

The case of the Green River serial killer in Washington is a suitable case example for analysis because the victims were female prostitutes who went missing. Of the 48 known victims, 4 women were reported as missing but were deleted from missing persons records by police personnel because of false rumors of sightings and another 4 cases were purged by accident from the missing persons database.⁶ Additionally, after the identification of remains, it was discovered that 2 victims were never reported as missing, and 1 other was reported but not until 5 years after disappearing. Five of the victims are still unidentified (Guillen, 2007; Rule, 2004). In the Green River Killer case, 23% (11 of the 48, not including unidentified dead) of victims were missing missing—victims for whom there was no active missing person case. Had many of the bodies not been dumped together in clusters, many of the victims may not have been discovered at all. Unless the bodies are found, the missing missing do not exist. Moreover approximately 10% (5 victims) in the Green River Killer case were unidentified dead. If these unidentified dead are also counted among the missing missing, the possible total of missing missing in just one case of a serial killer who preys on prostitutes would be 33%.

Applying Egger's (2003) claim that 65% of all serial murder victims are female and approximately 75% of known female serial murder victims are prostitutes to Hickey's (2004) lower estimate of 40 serial killer victims a year, 26 would be female and 20 of those would be prostitutes. Extrapolating from the Green River Killer case, if we assume that this figure (20 prostitute serial killer victims a year) is underestimated by 33% because of missing missing victims, approximately 6 additional victims would be added to lower estimates of the number of female victims per year (see Table 1, lower estimate missing missing). Applying Egger's claim to Fox and Levin's upper estimates of 120 to 180 serial killer victims a year, 78 to 117 victims would be female and 59 to 88 of those would be prostitutes. If we have a missing missing pattern similar to the Green River case (33%), there could be an additional 19 to 29 annual female prostitute serial murder victims that are never discovered (see Table 1, upper estimate missing missing).⁷

Foster children are another source of missing missing. Children in foster care in the United States are protected by confidentiality laws; their identity and the fact that

they are in the foster care system is strictly private information. In most states, when foster children go missing their name is not publicly released. With a few exceptions, there is no Amber Alert, no milk carton, no organized community search, and child protective services representatives will not speak to the public about these missing kids. In fact, in some states, biological parents are not even allowed to go to the media if their child who has been placed in foster care goes missing (“Few Looking for Missing,” 2002).

Of the 585,000 foster children in the United States, 20% (117,000) are missing at any given time, with 98% of those thought to be runaways (suggesting they are voluntarily missing) and 2% (2,340 children) unaccounted for (Peterson, 2002). Applying the Washington formula, 468 of the 2,340 unaccounted for missing children could be additional homicide victims with 70 of those being additional serial murder victims. Dividing this total across 5 years would add an additional 14 annual serial murder victims, and dividing across 3 years would add an additional 23 victims (see Table 1, missing foster children).

These revised estimates do not take into account possible murder victims among another pool of missing missing kids—the throwaways. Throwaways are children who are forced out by their parents. Rarely do parents call police to report that they forced their child out—there are virtually no statistics about this group. Even recent statistics from the National Incidence Studies of Missing, Abducted, Runaway, and Thrownaway Children do not specifically estimate the number of throwaway kids each year in the United States. Instead they include this estimate within the runaway category (Sedlak, Finkelhor, & Schultz, 2002). One organization, Families of Missing Loved Ones, suggests there may be as many as 127,000 throwaway children at any given time in the United States (Families of Missing Loved Ones, 2002). This group of children would be particularly vulnerable to predators—by definition no one cares enough about them to report them as missing, and no one knows where they are. Estimates of the number of throwaway children come from only one source and are not included in the estimates in Table 1.

Further case studies of serial killers and their victims are needed to establish the number of victims, once discovered, who were never reported as missing. Unless the bodies are found, the missing missing do not exist.

Unidentified Dead

The unidentified dead are made up of persons who died from any number of causes, including natural deaths, although the cause of death is unknown. For this analysis, the concern is the extent to which those unidentified dead are victims of homicide and, more specifically, serial homicide. It should be noted that some of the persons listed as missing persons also may be entered into unidentified dead databases so there may be some double counting when using both of these sources. Thus, lower, more conservative estimates are provided for extrapolations presented here.

Identifying the unidentified dead is not an easy process, particularly if the individual had spent a lifetime trying to hide his or her identity—a reasonable assumption for drifters, prostitutes, and other transient populations. Davis (1996) described a California case of an unidentified man killed in a stolen car in an accident. As the search for his identity unfolded, it turned out he had 25 different aliases, three social security numbers, and five different birthdates (all in different years). This man had not had any contact with family members for months, but had never been reported as missing. Clearly, unidentified dead can be very challenging cases for law enforcement. Identification is even more remote when all that is discovered is a few bones. Many jurisdictions across the United States only keep unidentified remains for a year, and then they are either buried in unmarked graves, or as is the case in San Francisco, once a month, the unidentified dead are incinerated and the ashes taken out to sea (Davis, 1996). Clearly the likelihood of ever tying most of the unidentified remains across the United States to a single serial killer under these conditions is unlikely.

According to the NCIC, there are currently 6,036 unidentified dead cases in their records (NCIC, 2006). Once a case is entered into NCIC (and it can only be entered by law enforcement), it has to be renewed annually by the originating agency to avoid having the records purged (Olsen & Kamb, 2003). Twenty-five percent of the unidentified dead in the NCIC system are female, and 71% are male (the gender of the remaining 4% is unknown; T. Matthews, personal communication, October 21, 2005). Findings for the state of Washington are similar—of their unidentified dead approximately 60% are male, 25% females, and 15% unknown. The proportion of NCIC unidentified dead who are female is similar to the proportion of female homicide victims in the United States.

A June 2007 Bureau of Justice Statistics (BJS) survey of medical examiners and coroners offices across the United States finds the NCIC statistics on unidentified dead to be significantly lacking (Hickman, Hughes, Strom, & Roper-Miller, 2007). The total number of unidentified human remains reported in the BJS survey (13,486) is 2 times that of the NCIC figure of 6,036. The nation's medical examiners and coroners report approximately 4,400 new unidentified human remains each year, and 1,000 of those cases remained cold/unidentified after a year. Only half of those offices surveyed reported having a policy for retaining records on unidentified remains (e.g., dental, DNA, fingerprints; Hickman et al., 2007). The BJS director, Jeffrey Sedgwick, suggested that a large number of the nearly 14,000 unidentified dead were likely homicide victims, and that the true number of remains is likely even much higher than 14,000 (Willing, 2007).

Another source of unidentified dead statistics, The Doe Network, is a volunteer organization that works with law enforcement and medical examiners to solve missing persons and unidentified dead cases. The Doe Network maintains its own database/Web site of unidentified dead cases and devotes significant energies toward finding matches between missing persons and unidentified dead records (Doe, 2006). Of the 1,112 unidentified dead cases in the Doe database, there are 11 cases from 1800 to 1969 (bodies discovered during this time period), 50 cases from 1970 to 1979, 251

cases from 1980 to 1989, 469 cases from 1990 to 1999, and 331 cases from 2000 through July of 2006 (Doe, 2006). If Doe patterns prevail, the 6,036 unidentified dead tracked by NCIC have accumulated primarily since 1970 with as many as 70% having accumulated since 1990 and more than 50% since 1996.

No public information is available at the national level through NCIC to indicate a typical cause of death for the thousands of unidentified bodies in morgues and other storage facilities, but we can look to other sources that track unidentified dead across the United States. The Network of Medico Legal Investigative Systems (NOMIS) is a death investigation Web-based program for agency use. As of January 2004, NOMIS differs from NCIC as cases may be entered by medical examiners and coroners, not just law enforcement. Of the approximately 473 unidentified dead entered into the NOMIS system, 36 died of homicide (8%), and an additional 41 died of undetermined (9%) causes (NOMIS, 2006). However, because NOMIS has been up and running for only 2 years and is used by only a limited number of agencies across the United States, it will not be used for establishing lower and upper estimates in this article.

As previously indicated, Washington state data contain 97 unidentified dead, 19 of which (20%) were homicides, with 3 (15%) of those likely serial homicides. Even in this model state, journalists for the *Seattle Post-Intelligencer* during a county-level investigation in Washington found another 21 cases of unidentified dead who had never been entered into the FBI-NCIC database (Olsen, 2003). Using the Washington unidentified dead findings to calculate likely causes of death for NCIC unidentified dead, 1,200 (20%) of the 6,000 NCIC unidentified dead would be homicide victims, and 15% of those (180) could be serial murder victims. If these 180 victims were the result of 10 years of accumulation (as are more than 50% of the Doe unidentified dead), then the annual number of unidentified dead that are likely serial murder victims is approximately 18. If they accumulated over a 15-year period (as did more than 70% of the Doe listings), then the annual number of serial murder victims would be 12 (see Table 1, NCIC). Using the BJS estimates from the 2004 survey of coroners and medical examiners would suggest as many as 2,697 (20%) of the 13,486 unidentified dead could be homicide victims, and 405 of those (15%) could be serial murder victims. If these unidentified remains accumulated over 10 years, we would have an additional 40 annual serial murder victims. If they accumulated over a period of 15 years, then the annual number of serial murder victims in the BJS unidentified dead would be 27 (see Table 1, BJS).

Some experts feel that the NCIC unidentified dead number, 6,036, reflects as little as 10% and only as much as 50% of actual unidentified dead numbers, because many law enforcement agencies do not report to NCIC and coroners cannot use NCIC (Matthews, 2006). Hypothetically, this could mean that there are as many as 12,000 to 60,000 unidentified dead in the United States (Matthews, 2006). If Matthews is correct, and there are 12,000 to 60,000 unidentified dead in the United States, then extrapolation from Washington State data suggests that 2,400 to 12,000 (20%) could

be homicide victims with 360 to 1,800 (15%) of those being serial murder victims. Dividing this range (360 to 1,800) across 10 and 15 years of accumulation would generate the lower range estimate of 24 to 36 and the upper range estimate of 120 to 180 in Table 1 (Matthews, 2006).

One would hope for a match/identification when information from missing persons and unidentified dead databases converge, but we know from recent research that if very specific information on a missing person is entered into NCIC and the same specific information on an unidentified dead person (the same missing person) is entered by another jurisdiction, there may be no match made. Haglund (1993) reported on a search in NCIC that included an exact dental match between an unidentified dead and a missing person but because of the weight of matching requirements, the NCIC system did not find the match. Bell's (1993) critique of the NCIC missing and unidentified dead matching program described the problem of inaccurate data input from the law enforcement agency. Haglund also noted extremely low national compliance (maybe as little as 2% for dental records entries), a lack of access by medical examiners and coroners, forms that need to be refined, and old cases that need to be updated or verified.

Misidentified and Elsewhere Classified Dead

The misidentified dead are comprised of deaths with unknown causes or deaths that are wrongly categorized as suicides, accidents, or natural causes, when in fact they are the result of homicide.

Each year in the United States, approximately 2.5 million people die. For the National Vital Statistics System (NVSS) to classify a death as a homicide, it must be certified by a coroner, medical examiner, or prosecutor acting as coroner, and (almost always) autopsied. In most states, all homicides require an autopsy, but because they are often not affordable, potential homicides may be coded as a natural, accidental, or suicide deaths to avoid incurring the costs of an autopsy (L. Smit, deputy coroner, Kitsap County, Washington, personal communication, November 4, 2005). In many jurisdictions accidental deaths and suicides are also certified and require autopsies if there are questions or pending litigation. The NVSS death certificates code the manner of death as natural, accidental, suicide, homicide, pending, or could not be determined (NVSS, 2006). The cause of death (e.g., gunshot, stabbing, and car accident) is classified by state-level employees using International Classification of Diseases codes. In several instances, the discovery of a body, particularly if time has passed since death, may result in the cause of death as undetermined when the manner of death is homicide (F. Kelley, Marion County deputy coroner, personal correspondence, summer 2004). In a recent case 10 female bodies were found at truck stops in Texas, Oklahoma, Arkansas, Missouri, Louisiana, and Tennessee. Of the 10, 1 is unidentified, and although the manner of death appears to

be serially related homicides, the specific cause of death is undetermined in 4 of the 10 cases (Lavendera, 2004; Ramirez, 2004).

Of the annual 2.5 million United States deaths, 32,000 (less than 1% of all deaths) deaths are coded as “something not elsewhere classified” (NVSS, 2006). In other words, the cause of death could not be determined. One of the populations most likely to be overlooked as the victims of serial murder are people who were at risk or expected to die—those who are in hospitals or nursing homes and those killed by custodial killers—nurses, mothers, and landladies. This trend is counterintuitive as custodial or stationary killers would seem more likely to be detected because observers (e.g., other nurses and doctors, tenants, family members) would notice their actions; however detection may actually be more difficult because these killers operate in settings where the opportunity is so significant. Custodial killers have distracted coworkers, a defenseless and vulnerable victim pool, and easy access to drugs and other homicide methods. As suggested by Stark, Paterson, Henderson, Kidd, and Godwin (2001), there are motivated offenders in all professions but the medical murder phenomenon may be a result of extraordinary opportunity, combined with a lack of surveillance and detection.

There are nearly 6,000 hospitals in the United States with nearly 1,000,000 beds that serve an annual admission population in excess of 35,000,000 people (American Hospital Association, 2003). In addition, according to the National Center for Health Statistics, 3 million people pass through 17,000 nursing homes each year. This amounts to a nursing home population of 1.8 million on any given day with more than 1.4 million employees (Schneider & O'Connor, 2002). Of the 2.5 million deaths in the United States each year, in excess of 860,000 occur in hospitals and over 500,000 occur in nursing homes. In excess of 50% of all deaths each year occur in hospitals and nursing homes (Agency for Healthcare Research and Quality, 2003). The opportunities for foul play are staggering.

Research on pediatric deaths also suggests room for error in reliable cause of death information (McClain, Sacks, Froehlke, & Ewigman, 1993). One team reviewed medical and death records of children and found that many cases were likely homicide but coded as deaths as a result of SIDS or other injury. They suggest that the infant homicide death rate may be 3 times as high as previously reported, making it similar to the homicide rate of teens (McClain et al., 1993). Although the SIDS death rate has decreased from 5,000 to 6,000 deaths a year to 2,100, it is still the third leading cause of death for persons under 1 year of age (NVSS, 2006).

Many medical murderers (doctors, nurses, and other medical staff who murder patients) used various poisons to cause cardiac arrest; the cause of death stops there, without further investigation into what actually caused the cardiac arrest. The coroner in Little Rock, Arkansas, suggested that when it is reported that a patient's heart “just stopped beating,” it is time for suspicion. This is an insufficient explanation of death; all hearts stop beating when we die. The real question is why. He suggests that 73% of death certificates from nursing home deaths list incorrect causes of death (Schneider & O'Connor, 2002).

Research on medical murderers/custodial killers has illustrated that many female serial killers use their workplace as their hunting and killing grounds; not only do they know their victims (dispelling the stranger myth) but they are often charged with their care. Recent focus on female serial killers finds that women have different hunting grounds and different killing opportunities than men. Their victims are men and women, children, and the elderly. From faux-SIDS cases to nursing home and hospital deaths—female serial killers are cradle-to-grave, equal-opportunity killers (Fox et al., 2005). These types of homicide are not represented anywhere in the Uniform Crime Reports or Supplementary Homicide Reports data; they are classified as natural deaths, SIDS, or other misidentified cause of death categories.

If we are overlooking female serial offenders, then we are overlooking their victims. Thus, the age/gender profile of serial murder victims is likely skewed as well. Fox and Levin (2005) noted that known female serial killers were twice as likely to have patients or elderly persons as their primary target (17% of the time) as were male serial killers (8% of the time). Based on the gender distribution of people in hospitals and nursing homes (for age group gender distributions, see Safarik, Jarvis, & Nussbaum, 2000), those who target the elderly or hunt in hospitals and nursing homes should be even more likely to have female victims than do serial killers who choose younger victims. Thus, we may not only be overlooking female serial killers but undercounting female victims as well. Hickey (2004) noted that, since 1975, the likelihood that a serial murder cases involves elderly victims has risen rather dramatically.

As shown in Table 1, an examination of known cases suggests that a reasonable estimate of the number of medical murder victims annually could be 500 to 1,000 (Fox et al., 2005). Known medical murderers appear to average 2 victims per month. In a small county in Indiana, Orville Lynn Majors killed as many as 130 patients in about 2 years, all of which were coded as natural deaths. Even after investigations revealed the true causes of death, the death certificates were never updated (G. Carter and N. Alexander, prosecutors in the Orville Lyn Majors case, personal communication, February 4, 2005).

Each year approximately 3,175 inmates die in U.S. prisons. The bulk of the deaths 2,400 (75%) are coded as natural causes, approximately 1% (56) homicide, 6% (198) suicide, 10% (302) AIDS, and the rest were considered “other” including executions and unspecified accidents or drug overdoses (Stephan & Karberg, 2003). There have been recent reports of jails and prisons hiring physicians who have lost their medical license (Skolnick, 1998). These doctors have either been convicted of some sort of crime or lost their license because of professional misconduct, but prisons and jails—filling with more prisoners everyday, and dealing with an aging population, AIDS, tuberculosis, mental illness, and other diseases—will still hire them. The idea that incompetent, possibly dangerous physicians are now turned loose on a trapped jail and prison population has come under scrutiny, but the practice has not stopped (Skolnick, 1998).

Mott (1999) suggested that serial killers may remain undetected because of their transient, multijurisdictional, geographically mobile nature. However, research comparing

solved serial killings to unsolved serial killings finds that solved serial killings were more likely to include the geographically mobile killer whereas the place-specific killer was more likely to be the culprit in unsolved cases. This seems counterintuitive as it would appear to be easier to detect and apprehend a stationary killer, but that is not the case. In addition to the mobility issue, research comparing solved serial killings to unsolved serial killings finds that unsolved serial killings have longer time periods between murders, and the bodies are more likely to be discarded outdoors (although our institutionally place-specific killers typically do not discard bodies outdoors). Place-specific killers are not necessarily harder to investigate or profile, but they are often not being investigated until the offender is already identified. It is also noteworthy that the unsolved serial murders were significantly more likely to have targeted vulnerable populations such as prostitutes or homeless (Mott, 1999).⁸ Another possibility is that there are not actually longer time periods between unsolved murders of populations of prostitutes or the homeless but, rather, because the unsolved population is a more marginal and invisible group, the time periods between murders are not marked by telltale events such as victims reported missing, discovered bodies, significant media coverage, or official investigations.

There is no reason to suggest that opportunity patterns that exist for other crimes do not also apply to perpetrators of homicide. Assuming opportunity matters and as our institutionalized population numbers increase, we should expect to see an increase in the medical murder phenomenon in our prisons, nursing homes, hospitals, and hospice centers. A sick, trapped/incarcerated, vulnerable, weak victim pool makes for easy prey for serial killers. If potential offender pools include not only people who are motivated to kill but who also have opportunity (e.g., home health care providers, nurses, doctors, and prison staff) and access to means, then our victim pools, Egger's less-dead will also include institutional populations.

Conclusions

This study provides extrapolation from existing databases including missing persons and unidentified dead to estimate uncounted serial murder. Results suggest we have overlooked a number of serial murder victims for years. In any given year we can conservatively add hundreds of additional serial killer victims—missing persons who are actually dead, missing missing who are dead (unreported missing prostitutes and foster children), the unidentified dead who were murdered by serial killers, and serial murder victims from institutional settings (nursing homes, hospitals, and prisons) who were misclassified as natural deaths. The present research suggests that even if a small proportion of these deaths were serial homicides then our true serial murder victim count is and always has been low (excluding the exaggerated estimates of the 1980s). By counting potentially hidden serial murder victims, we add a minimum number of 182 annual serial murder deaths (doubling the 2005 estimate of

Fox and Levin) and as many as 1,832 uncounted annual serial murder deaths (more than 10 times the estimate of Fox and Levin) to existing counts.

An inherent limitation of this study is the fuzzy nature of many of the data sources used for extrapolation. To the extent that official data on the numbers of missing persons, unidentified dead, the missing missing, and causes of death in institutional and other settings are invalid, the extrapolations and estimates from these sources are flawed, potentially in either direction. For example, if the state of Washington's missing persons data collection system and analyses of the number of missing who are dead and the number who were victims of serial homicide are not reflective of other states, the present estimates may require revision. Research is needed to determine the demography of missing persons and unidentified dead by state. The accuracy of revised estimates presented here is also dependent on the accuracy of current serial murder counts which serve as the baseline for extrapolations accounting for hidden victims. This study is a first step toward a more detailed attempt to quantify serial murder victimization in the United States, but much work is needed to improve the primary data sources on which it relies.

As researchers, we can do further serial murder case study analyses to better establish the possible number of missing missing among the victims. The present research most likely underestimates the missing missing in serial murder cases as it only addresses missing missing female prostitutes. Cases where bodies are discovered buried together will shed the most light on the number of victims who were either never identified or never reported as missing. Additional research is needed to verify Egger's (2003) claim that approximately 75% of female serial murder victims are prostitutes and to quantify the proportion of serial murder cases that involve male prostitutes, runaways, homeless, and other vulnerable populations likely to account for the missing missing. Hickey's (2004) research suggests that the most likely category of victim selection for serial killers is *young women alone* comprised of prostitutes and female college students (followed by children, boys, and girls). In all likelihood, missing college coeds who were slain by serial killers are well counted. It is the other dimension of this category—prostitutes—who are more likely undercounted as serial murder victims.

Statistics on the number of teenage runaways and children who are abandoned (throwaway) by parents and guardians are the least reliable. In fact, almost no entity is even trying to estimate the number of throwaway kids. When teenage runaways turn 18, they are no longer on the rosters of missing children, and almost no entity is scientifically estimating the number of throwaway kids. These troubling patterns present room for policy change: missing children who are thought to be runaways could be kept as active missing person cases even when they are no longer juveniles; school systems could play a more active role in tracking children who slip through the cracks and may be throwaway and in need of supervision; and the foster care system could be overhauled and repaired.

On the law enforcement side, there are a number of impediments to the investigation of the reports of missing persons. Warrants are required to access bank and

credit card activity, and it is difficult, sometimes impossible, to get information from government entities including Social Security, the Military, IRS, public assistance, and the Postal Service. The Health Insurance Portability and Accountability Act of 1996 protects the release of medical information, even to law enforcement, regarding whether a person has been admitted to a hospital, mental hospital, or emergency room. Domestic violence shelters, understandably, will not tell police whether a woman is in their facility. In the event that police do locate a missing person 18 years of age or older, they are not required to disclose the person's location to those who reported them as missing (Indianapolis Police Department, interviews of missing persons detectives, personal communication, June 2005). At a minimum, permitting law enforcement greater access to critical, timely information would aid in the investigation of missing person's cases.

Death surveillance systems in hospitals and nursing homes, greater control of lethal drugs and medications not currently classified as controlled substances, and increased scrutiny of nurses, doctors, and other medical personnel who hospital hop would help deter and detect medical murder. Although it may be popular to dedicate limited resources to enhancing safety on college campuses and in suburban neighborhoods, such initiatives are not likely to significantly impact the incidence of serial homicide. Wiser alternatives may include security cameras at truck stops frequented by transient offenders and less-missed victims, systems for tracking the missing homeless, and strategies for reporting and finding missing migrant workers and illegal immigrants.

Ritter's (2002) call for research that has policy and investigative implications challenges us to assess the ways we may begin to prevent serial homicide. Much has been written and speculated about the etiology of a serial murder. Potential victims and society may be better served if we think about monitoring the opportunities given to serial killers. A hot spot approach to preventing serial murder might begin at truck stops and other areas frequented by prostitutes. A less punitive, more resource-based approach to dealing with prostitution (similar to the ways we have tried to track and care for the homeless) may encourage prostitutes to report other missing prostitutes or suspicious customers. With prostitution as the most dangerous job on record, a preventive focus and more resources could prevent the horrific prostitute body counts of one killer who has 60 to 70 victims.

We have a limited amount of resources to combat homicide, including serial homicide. The horrific loss of life, the fear engendered by serial murder, and the high cost of investigations make it critically important to establish reliable estimates of risks for certain populations. The present research suggests a paradigm shift in which missing persons cases and marginalized victims are prioritized rather than minimized will be necessary to effectively address this crime.

Although we exaggerated the prevalence of serial murder in the 1980s, we now may be underestimating the prevalence of serial murder victims and offenders in certain sectors of our society. Although it seems improbable that we underestimated

a phenomenon as widely covered and as sensationalistic as serial murder, in many cases the victims we are overlooking are the marginalized—Egger’s less-dead—those who are less-missed, less-guarded, and, as this research suggests, less-counted.

Notes

1. Lucas claimed more than 300 victims and, although Fox and Levin (2005) suggested that at some point he may have claimed to have as many as 600 victims, in all likelihood had approximately 10 victims.

2. Interview of prosecutors, Gregory Carter and Nina Alexander, in the case against Orville Lynn Majors, Vermillion County, Indiana, February 4, 2005.

3. Place-specific refers to homicides that occur in one location (e.g., a hospital, home, prison, nursing home).

4. In the book, *The Killers Among Us* by Steve Egger (2002, p. 89), the following appears: “In the United States, nearly 78% of female victims of serial murderers are female prostitutes” (K. Egger, 2000). The reference section of the book does not include a full cite for K. Egger 2000 but rather only K. Egger 1999 which is cited as an unpublished preliminary database of serial killers from 1900 to 1999. Aside from the citing confusion, it is not possible to deconstruct this claim because data are unpublished. This finding is cited by others (e.g., Hickey, 2004) but again, without any further explanation or documentation.

5. The formula used for most estimates with the exception of missing missing, which is only calculated for female prostitutes (see note 7), is to take the base number, multiply by 0.20 (because 20% are suspected homicides according to the Washington formula), and then multiply by 0.15 as the Washington findings suggest 15% of all homicides in the missing and unidentified dead categories may be the work of serial offenders.

6. Ridgway remembered and confessed to 48 murders but there is strong evidence to suggest that he killed more than 60 women (Guillen, 2007). The current analysis uses 48 as the total victim count.

7. The assumptions are that there are additional unfound, uncounted female prostitute victims each year. Using the Ridgway case as a basis for calculation, as many as 33% of his victims are missing missing or unidentified dead—we know this only because he buried his victims in clusters and we were able to find more bodies than we would in most cases. The way to calculate is to multiply the estimated total annual number of serial murder victims by 0.65 (because 65% of victims are female), then multiply by 0.75 (using Egger’s approximate estimate that 75% of female victims are prostitutes), and then by 0.33 (the percentage of missing missing in the Ridgway case). These figures reflect only the missing missing that are female prostitutes; analysis of other cases involving male prostitutes could be used to further refine the estimates, but there has been no scientific attempt to establish the proportion of serial murder victims that are male prostitutes.

8. Potterat et al. (1990) found that there were approximately 84,000 working prostitutes in the United States during the 1980s and that average career lengths were 4 to 5 years.

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