A Practical Approach to Public Health Surveillance of Violent Deaths Related to Intimate Partner Relationships

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SYNOPSIS

Objectives. Articles describing the epidemiology of intimate partner homicide (IPH) have often been positioned as one-time research projects utilizing a single data source for case identification. However, researchers without access to centralized repositories for data pertinent to IPH can ascertain cases by using multiple extant data sources. The authors describe a surveillance system that can serve as a model for state health departments and others seeking to quantify and characterize violent deaths related to intimate partner relationships on an ongoing basis.

Methods. Retrospective surveillance was conducted to identify and characterize deaths related to intimate partnerships by linking the following data sources: death certificates, newspaper articles, law enforcement reports, and medical examiners' records.

Results. The authors identified at least 34% more IPHs using multiple data sources than would have been recognized solely using Supplementary Homicide Reports—the most frequently cited data source for IPH case ascertainment—and 22% more cases than newspaper data alone would have allowed for.

Conclusions. While it was discovered that at least 181 IPHs—and at least 128 other deaths related to intimate partnerships—occurred in Michigan from 1999–2001, this frequency of occurrences is probably conservative. This limitation is due, in part, to the researchers not having access to information from all possible data source contributors. However, in the absence of statewide data systems, the authors demonstrate the utility of using multiple data sources for violent death surveillance to address incomplete case ascertainment.

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Although it has been disputed which gender is more likely to be victimized by an intimate partner,¹⁻¹¹ females in the United States are more apt to suffer greater physical consequences than men as a result of such violence. Women in the U.S. experience a disproportionate amount of fatal intimate partner violence (hereafter referred to as *intimate partner homicide*). According to the Federal Bureau of Investigation, an average of five intimate partner homicide (IPH) victims were identified daily in the U.S. from 1999–2000, and almost three-fourths (74%) of the victims were women.¹²

One of the complexities in studying violent deaths associated with intimate partner relationships is the lack of standardized case identification methods. The pervasiveness of intimate violence-related mortality, combined with the lack of customary measurement techniques, creates a need to systematically and consistently characterize the issue. It is important to have accurate data about the magnitude and nature of a problem in order to develop appropriate policy responses,¹³ and public health surveillance systems are a primary source of such information. However, a recent survey of senior leadership in state health agencies indicates that current injury data collection systems are inadequate and underfunded, thereby impeding educational efforts aimed at policy makers.¹⁴

Beyond influencing policy makers, though, intimate partner violence surveillance allows public health professionals and others to identify groups at highest risk, design and implement critical interventions, and evaluate whether programs and policies are having the intended impact. At a time when so many public health issues compete for resources—e.g., emergency preparedness and childhood obesity—public health professionals could benefit from a low cost, practical approach to intimate partner violence surveillance. This article describes such an approach via the Michigan Intimate Partner Homicide Surveillance System (MIPHSS).

METHODS

We classified decedents using the following criteria. *Intimate partner homicide (IPH)*: the relationship between a homicide victim and suspect was that of current or former intimate partners, or one partner hired/caused someone else to kill the other partner. *Intimate partnership-related (IPR) death*: an individual committed suicide in connection with circumstances surrounding an intimate partner relationship in which he/she was involved or within three months of committing (or attempting) an IPH; or a homicide related to an

intimate partnership in which the victim was not one of the intimate partners (e.g., the ex-husband killed his former partner's new boyfriend).

The primary population of interest for IPHs consisted of all homicide victims from 1999–2001 in the state of Michigan where the victim was age 13 years or older at the time of death. There were no age criteria for IPR decedents. For the MIPHSS, *intimate partners* include current or former spouses, current or former non-marital partners (boyfriend/girlfriend/dating; heterosexual or same-sex), and individuals with a child in common. We included Michigan residents who died out-of-state for the calculation of rates.

Law enforcement reports, medical examiner records, death certificates, and newspaper articles were used for case ascertainment. The Michigan Department of State Police oversees multiple systems for the reporting of homicide data by law enforcement agencies, including Supplementary Homicide Reports.¹⁵ Because the focus of the MIPHSS is willful killings, cases classified as justifiable homicide or involuntary manslaughter were excluded from the database.

The Michigan Medical Examiner Database (MEDB) is an Internet-based data collection system that allows the state's county-based medical examiner (ME) offices to manage case information via a centralized database. Michigan law requires MEs to investigate the cause(s) and manner of death in instances of sudden, unexpected, accidental, violent, or suspicious death.¹⁶ Almost two-thirds of Michigan's MEs (51 out of 83) voluntarily participate in the MEDB. We requested access to case information from each participating county ME office and received permission from 46.

Homicide information gleaned from the media came from two newspaper sources. First, we searched Michigan newspapers' online sites for violent deaths possibly involving intimate partner relationships. We also received copies of such stories from a newspaper clipping service. Staff abstracted articles by entering salient data items into a computer database (list of data items available from the corresponding author) and manually verified all entries by comparing information entered electronically with that reported in the original stories.

Death certificates are part of Michigan's statewide vital statistics system. Certificates are coded by state nosologists based on information provided by the certifier of death. Death certificate data were subset from the vital statistics system based on ICD-10 codes¹⁷ describing specific underlying and related cause(s) of death (list of selected codes available from the corresponding author). Theoretically, all cases of interest

should have a death certificate on file with the state's vital statistics system. Therefore, this source was used to populate the dataset.

Various computer algorithms were used to deterministically link law enforcement, medical examiner, and newspaper records with the death certificates. For example, records from newspapers were linked with death certificates based on agreement of information contained in several key variables (victim name, sex, age, and date of death). If a newspaper record and death certificate matched on victim's last name, first name, sex, and date of death, but differed by one year for victim's age, the age value found in death certificates was considered correct and the pair deemed a match. Information regarding where the death occurred (county) was also used to manually verify linkages. Details about record mergers are not included here for purposes of brevity, but the procedure is illustrated elsewhere.¹⁸ All results are considered descriptive (i.e., no testing for statistical significance was performed).

RESULTS

From 1999–2001, 314 violent deaths connected to intimate partner relationships were recorded in the MIPHSS database: 186 IPHs (181 occurrences in-state and five residents out-of-state) and 128 IPR deaths. Cross-matching IPH cases among police, ME, and newspaper data sets yielded moderate overlap (Figure 1). We identified approximately half (51.4%) of the 181

IPH cases occurring in Michigan in at least two of the three sources; we found less than 10% of cases in all three sources (14/181).

The majority of IPH victims identified in Michigan were women (84.5%). Age-adjusted IPH rates (based on Michigan-resident IPHs [$n=178$]) declined 23% between 1999 and 2001—from a high of 8.2 per million residents in 1999 (95% confidence interval [CI] 6.2, 10.2) to 7.4 in 2000 (95% CI 5.5, 9.3) and 6.3 in 2001 (95% CI 4.6, 8.0). This downward trend would have been evident using only law enforcement reports, but reliance on newspapers alone would have obscured this pattern (Figure 2).

The proportion of IPH victims killed by a current spouse (48.1%) was slightly greater than the proportion killed by a non-marital partner (40.9%). Former non-marital partners were also responsible for a substantial proportion of IPHs (7.7%). The demographics of IPH victims identified in the different sources were quite similar, but compared to law enforcement agencies, newspapers reported on a slightly greater percentage of females. Because newspapers rarely report a victim's race, this characteristic could not be compared.

In addition to the 186 intimate partner homicide victims identified in the MIPHSS for 1999–2001, the system registered 128 IPR deaths. This total does not include any of the actual homicide victims that were killed by a current or former intimate partner. Males comprised most of the IPR decedents in general (82.7%) and virtually all of the decedents who committed suicide (96.7%) (Figure 3). Forty-two of the male IPR deaths were suicides following a completed homicide. Five IPR decedents not represented in Figure 3 were unborn babies (sex unknown) whose mothers died via intimate partner homicide.

Figure 1. Venn diagram illustrating frequencies and overlap of in-state intimate partner homicides identified in datasets—Michigan Intimate Partner Homicide Surveillance System, 1999–2001

DISCUSSION

We believe the Michigan Intimate Partner Homicide Surveillance System is both adequate and practical for generating essential information to influence policy makers and support public health prevention activities. By utilizing extant data sources, the MIPHSS requires no funding for primary data collection. In terms of staff hours, the first two authors devoted approximately 780 hours to secondary data collection, record linkage, and analysis—300 hours in 1999, 260 hours in 2000, and 220 hours in 2001 (less time was required with experience). At an average hourly wage of \$15 for data collection and \$25 for linkage/analysis, this would equate to approximately \$16,500 for three years of data.

Intimate partner homicide comprised an important

Figure 2. Frequencies of intimate partner homicides identified in newspaper and law enforcement datasets by year of occurrence—Michigan, 1999–2001

NOTE: Medical examiner data not included because of small yearly totals.

segment of all homicides in Michigan from 1999–2001. There were 2,005 murder victims identified in Michigan during the period.^{19–21} Based on findings from the MIPHSS, intimate partner homicide victims comprised approximately one in ten murder victims, which is similar to other accounts that relied on multiple years of data.^{12,22–25} Previous analyses have also shown that females are more likely to be fatally victimized by an intimate than are males.^{12,22,23,26,27} Data from the MIPHSS for 1999–2001 indicate that identified female IPH victims outnumbered males by a five to one ratio (158 vs. 28).

When the MIPHSS was designed, we recognized the importance of capturing information on *all* intentional deaths related to intimate partner relationships—to do otherwise would severely downplay the magnitude of the problem. Thus, a definition for *intimate partnership-related (IPR) deaths* was developed. More than one hundred such cases were captured by the MIPHSS for 1999–2001 ($n=128$). Taken collectively, then, an average of about one hundred violent deaths related

to intimate partner relationships occurred every year (186 IPHs plus 128 IPR deaths).

By using multiple data sources, we have highlighted several potential differences in IPH frequency, trends, and victim characteristics vs. what might be seen using only one source. We say “potential” because the findings presented are descriptive in nature. For example, in terms of observed annual trends, the lack of a discernible decline in IPH frequency using newspaper data (Figure 2) may reflect a combination of the authors’ case-finding methods and journalists’ reporting practices. (We were not able to estimate the coverage provided by online newspaper sites we used for case identification during 1999–2001.) As for victim characteristics, newspaper-reporting practices may also help explain observed differences. For example, factors are often present in IPH cases—including a female victim and multiple victims—that make them more newsworthy than a “typical” homicide.^{28,29} Michigan newspaper data indicate females outnumbered male IPH victims by almost an eight to one ratio. This ratio

Figure 3. Distribution of identified intimate partnership-related deaths by victim's sex and relationship to suspect—Michigan, 1999–2001

drops to about five to one using multiple sources. Sole reliance on police data would have hidden the finding that about 8% of IPHs were committed by a former dating partner (i.e., ex-boyfriend/-girlfriend), since Supplementary Homicide Reports submitted by police do not allow for coding such relationships.¹⁵

Researchers in Michigan who relied solely on law enforcement reports for 1999–2001 data would have underestimated the number of IPHs in the state by at least 34% (Figure 1). Sole reliance on newspapers would have produced an IPH count 22% less than the MIPHSS total. However, we should mention that in constructing Figure 1, we did not go back to the law enforcement data and search for IPHs that were exclusive to newspapers ($n=51$). It is possible some or all of these 51 cases were indeed present in the police data set, but were not found because they lacked an applicable victim-offender relationship code. Such secondary record linkage is difficult without the presence of personal identifiers in police data. Nevertheless, professionals conducting surveillance in other states

should recognize the practicalities of using comparable data sources.

Because the MIPHSS relies on extant data, limitations related to sources accessed for the system are not under our control. Nevertheless, these shortcomings need to be considered by others seeking to undertake surveillance using similar data sources. The primary shortcoming of death certificates for such surveillance is that they do not contain a field indicating the victim-offender relationship in homicide cases. Thus, these records cannot be used to actually ascertain IPHs except where ICD-10 code Y07.0, *Maltreatment syndromes by spouse or partner*, is assigned (none of the death certificates in the MIPHSS included that particular code). However, we were able to link other sources to death certificates in order to use vital records variables to describe victim characteristics.

The Michigan Medical Examiner Database (MEDB) provided medical examiner data for the MIPHSS. The main limitation of this source is that, as it is a voluntary system, not all of Michigan's MEs use the MEDB. Until

more medical examiners are using the MEDB and sharing their data for the MIPHSS, case ascertainment with this source will be limited. While this drawback will not impact researchers with access to centralized medical examiner system data, those without such access should be aware of the difficulties involved with requesting data from many MEs or coroners, particularly in states as large as Michigan (83 counties).

The homicide database prepared by the Michigan Department of State Police is comprised of two main report types: Supplementary Homicide Reports (SHR) and Michigan Incident Crime Reports (MICR). Although the National Incident Based Reporting System (NIBRS)—of which MICR is a part—is designed to enhance reporting of crime information by law enforcement agencies,¹⁵ the NIBRS system does not compensate for the shortcomings of the SHR in terms of intimate partner homicide surveillance.³⁰ The limitations of SHR data for studying violent deaths related to intimate partner relationships are well documented, including: the underreporting of IPH cases due to missing information within reported cases, exclusion of ex-boyfriends or ex-girlfriends as victim-offender relationship types, and an inability to parse out IPR deaths.^{30–32} However, SHR data have been shown to be fairly accurate in terms of the overall number of homicides reported.^{22,33,34}

There is no national surveillance system for intimate partner homicide or intimate partnership-related deaths in the United States. This may change with the advent of the National Violent Death Reporting System (NVDRS). This reporting system is designed to capture all violent deaths, including those related to intimate partner violence. Currently, the NVDRS is being field tested in 17 states.³⁵ While we believe in the utility of the NVDRS, it will be some time before that system can be implemented nationwide. In fact, no additional states were funded as part of the NVDRS in fiscal year 2005 due to federal budget cuts. For the time being, public health surveillance of violent deaths involving or related to intimate partner relationships is the responsibility of individual states, and the Michigan Intimate Partner Homicide Surveillance System can serve as one example for those seeking a practical approach.

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REFERENCES

1. Straus M, Gelles R. Societal change and change in family violence from 1975 to 1985 as revealed by two national surveys. *J Marriage Fam* 1986;48:465-79.
2. Tjaden P, Thoennes N. Extent, nature, and consequences of intimate partner violence—findings from the National Violence Against Women Survey [cited 2006 Mar 21]. Washington: Department of Justice (US), Office of Justice Programs, National Institute of Justice; 2000 Jul. Report No.: NCJ 181867. Available from: URL: <http://www.ncjrs.gov/pdffiles1/nij/181867.pdf>
3. Rennison CM. Intimate partner violence, 1993–2001 [cited 2006 Mar 21]. Washington: Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics; 2003 Feb. Report No.: NCJ 197838. Available from: URL: <http://www.ojp.usdoj.gov/bjs/pub/pdf/ipv01.pdf>
4. Archer J. Sex differences in aggression between heterosexual partners: a meta-analytic review. *Psychol Bull* 2000;126:651-80.
5. Frieze IH. Violence in close relationships—development of a research area: comment on Archer (2000). *Psychol Bull* 2000;126:681-4.
6. O'Leary KD. Are women really more aggressive than men in intimate relationships? Comment on Archer (2000). *Psychol Bull* 2000;126:685-9.
7. White JW, Smith PH, Koss MP, Figueredo AJ. Intimate partner aggression—what have we learned? Comment on Archer (2000). *Psychol Bull* 2000;126:690-6.
8. Archer J. Sex differences in physical aggression to partners: a reply to Frieze (2000), O'Leary (2000), and White, Smith, Koss, and Figueredo (2000). *Psychol Bull* 2000;126:697-702.
9. Saunders DG. Are physical assaults by wives and girlfriends a major social problem? A review of the literature. *Violence Against Women* 2002;8:1424-48.
10. Kimmel MS. "Gender symmetry" in domestic violence: a substantive and methodological research review. *Violence Against Women* 2002;8:1332-63.
11. Hamberger LK, Guse CE. Men's and women's use of intimate partner violence in clinical samples. *Violence Against Women* 2002;8:1301-31.
12. Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics. Homicide trends in the U.S.—intimate homicide [cited 2006 Mar 21]. 2002 Nov. Available from: URL: <http://www.ojp.usdoj.gov/bjs/pub/pdf/htius.pdf>
13. Kilpatrick DG. What is violence against women: defining and measuring the problem. *J Interpers Violence* 2004;19:1209-34.
14. Association of State and Territorial Health Officials (US). Issue Brief—perspectives on injury prevention and control from state health leaders [cited 2006 Mar 21]. 2004 June. Available from: URL: <http://www.astho.org/pubs/LEADERSHIPSPERSPECTIVESONINJURY061404.pdf>
15. Department of Justice (US), Federal Bureau of Investigation. Uniform crime reporting handbook—NIBRS edition. Washington: 1992.
16. County Medical Examiners Act of 1953, MCL Chapter No. 52, Act 181, Section 52.202 (Jan. 1, 1954).
17. World Health Organization (WHO). International Statistical Classification of Diseases and Related Health Problems, Tenth Revision. Geneva: WHO Publications Office; 1993.
18. Michigan Department of Community Health, Injury Prevention Section. Intimate partner homicide in Michigan—1999. Lansing (MI): 2004 May. Contract No.: U17/CCU551067. Sponsored by the Centers for Disease Control and Prevention.
19. Michigan State Police, Criminal Justice Information Center, Uniform Crime Reporting Section. 1999 Uniform Crime Report [cited 2006 Mar 21]. Available from: URL: http://www.michigan.gov/documents/UCR1999_17577_7.pdf
20. Michigan State Police, Criminal Justice Information Center, Uniform Crime Reporting Section. 2000 Uniform Crime Report [cited 2006 Mar 21]. Available from: URL: http://www.michigan.gov/documents/annrep2000_17278_7.pdf
21. Michigan State Police, Criminal Justice Information Center, Uniform Crime Reporting Section. 2001 Uniform Crime Report [cited 2006 Mar 21]. Available from: URL: http://www.michigan.gov/documents/2001_UCR_Annual_Report_49321_7.pdf
22. Paulozzi LJ, Saltzman LE, Thompson MP, Holmgren P. Surveillance

- for homicide among intimate partners—United States, 1981–1998. *MMWR Surveill Summ* 2001;50(SS-3):1-16.
23. Puzone CA, Saltzman LE, Kresnow MJ, Thompson MP, Mercy JA. National trends in intimate partner homicide—United States, 1976–1995. *Violence Against Women* 2000;6:409-26.
 24. Moracco KE, Runyan CW, Butts JD. Female intimate partner homicide: a population-based study. *J Am Med Womens Assoc* 2003;58:20-5.
 25. Block CR, Christakos A. Intimate partner homicide in Chicago over 29 years. *Crime Delinq* 1995;41:496-526.
 26. Kellerman AL, Mercy JA. Men, women, and murder: gender-specific differences in rates of fatal violence and victimization. *J Trauma* 1992;33:1-5.
 27. Mercy JA, Saltzman LE. Fatal violence among spouses in the United States, 1976–85. *Am J Public Health* 1989;79:595-9.
 28. Johnstone WC, Hawkins DF, Michener A. Homicide reporting in Chicago dailies. *Journalism Mass Commun Q* 1994;71:860-72.
 29. Sorenson SB, Manz JG, Berk RA. News media coverage and the epidemiology of homicide. *Am J Public Health* 1998;88:1510-4.
 30. Langford L, Isaac N, Kabat S. Homicides related to intimate partner violence in Massachusetts: examining case ascertainment and validity of the SHR. *Homicide Studies* 1998;2:353-77.
 31. Pampel FC, Williams KR. Intimacy and homicide: Compensating for missing data in the SHR. *Criminology* 2000;38(2):661–80.
 32. Maxfield MG. Circumstances in Supplementary Homicide Reports: variety and validity. *Criminology* 1989;27:671-95.
 33. Maltz MD. Bridging gaps in police crime data [cited 2006 Mar 21]. Washington: Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics; 1999 Sept. Report No.: NCJ 176365. Available from: URL: <http://www.ojp.usdoj.gov/bjs/pub/pdf/bgpcd.pdf>
 34. Riedel M. Nationwide homicide data sets: An evaluation of the uniform crime reports and the National Center for Health Statistics data. In: MacKenzie DL, Baunach PJ, Roberg RR, editors. *Measuring crime: large-scale, long-range efforts*. Albany: State University of New York Press, 1990.
 35. Centers for Disease Control and Prevention (US), National Center for Injury Prevention and Control. National Violent Death Reporting System [cited 2006 Mar 20]. Available from: URL: <http://www.cdc.gov/ncipc/profiles/nvdrs/facts.htm>