



*Intimate Partner
Violence Against
Women
in Michigan:*

*Findings from Emergency
Department Surveillance,
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INTRODUCTION

The Michigan Department of Community Health (MDCH), in collaboration with the Michigan Public Health Institute (MPHI), has instituted a public health surveillance system that contains two major components: the Michigan Emergency Department Community Injury Information Network (MEDCIIN) and the Michigan Intimate Partner Violence Surveillance System (MIPVSS). MEDCIIN is a voluntary surveillance system that collects data about injuries treated in hospital emergency departments, while the MIPVSS collects additional data elements on MEDCIIN cases for women that have been victimized by an intimate partner. The MIPVSS also includes data on cases related to intimate partner violence from the criminal justice system, thus providing two separate, but equally important indicators of intimate partner violence against women in Michigan. The combined MEDCIIN/MIPVSS database is a unique data resource for public health surveillance and research.

This report focuses on findings from data^a collected on victims of intimate partner violence seen in hospital emergency departments participating in the MIPVSS during the years 1999-2000.

BACKGROUND

Intimate partner violence is a significant health problem for women. Intimate partner violence (IPV) has been defined as a pattern of assaultive and coercive behaviors—including physical, sexual, and psychological attacks, as well as economic coercion—that adults or adolescents use to gain and maintain control over their current or former intimate partners.^b The pervasiveness of IPV is evident by the finding that nearly one in four surveyed American women have admitted being physically assaulted and/or raped by a current or former intimate partner at some time in their life.¹ Furthermore, a representative survey regarding violence in the lives of Michigan women found that one out of five women in the state with current partners reported sustaining some type of violence (i.e., physical, sexual, or threatened) in that relationship.² The more than half a million women nationwide estimated to seek medical treatment for their IPV-related injuries and other conditions annually additionally demonstrates the seriousness of this problem.¹ IPV against women has been shown to account for nearly \$4.1 billion in the direct costs of medical care and mental health care visits (based on 1995 figures).³

One of the complexities in studying intimate partner violence is the lack of standard definitions and methodologies for identifying cases. The combination of the pervasiveness of this violence and the lack of standard measurement techniques created a need to systematically and consistently characterize the issue using surveillance systems. The definition for public health surveillance often used by the U.S. Centers for Disease Control and Prevention (CDC) is:

“...the ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practice.”⁴

^a Please note that these are raw data and have not been weighted.

^b Adapted from: Warshaw C, Ganley A, and Salber P. *Improving the Health Care Response To Domestic Violence: A Resource Manual for Health Care Providers*. San Francisco: Family Violence Prevention Fund, 1996.

Michigan, through the Violence Against Women (VAW) Prevention Program in the Injury Prevention Section of the Michigan Department of Community Health (MDCH) is one of five states that have a cooperative agreement with the Centers for Disease Control and Prevention to implement an ongoing surveillance system of violence against intimate partners. A system such as the MIPVSS is needed because there is no single source in Michigan that currently can provide useful information on this major health issue for women.

The Michigan Intimate Partner Violence Surveillance System (MIPVSS) is a source of information intended to provide statewide estimates of intimate partner violence (particularly violence against women) in Michigan on an ongoing basis. This voluntary system allows: a) the characterization of victims and perpetrators of this violence; b) identification of high-risk groups; c) monitoring trends in incidence; and d) more comprehensive evaluation of the effectiveness of violence prevention policies and interventions.

At this time, the main population of interest for the MIPVSS is women aged 16 and older who have sustained non-fatal physical and/or sexual violence, or have been threatened with this type of violence, by an intimate partner. The specific cases of interest are:

- Women utilizing the services of a sample of Michigan hospital emergency departments (EDs) for medical attention related to an assault by an intimate partner and
- Incidents for which a Michigan county prosecuting attorney's office has authorized an arrest warrant for an assault and battery—domestic violence charge or which have final charges for assault and battery—domestic violence.

The remainder of this report will focus on data collected on victims of IPV that presented to hospital emergency departments participating in the MIPVSS during the years 1999 and 2000. While most cases involved Michigan residents, some victims were from out-of-state. Conversely, some Michigan residents are missed because the medical services they used were located out-of-state. Future reports will look at data from the county prosecuting attorneys' offices and homicides committed by intimate partners.

DEFINITIONS

Physical violence

For the purposes of the MIPVSS ED component, physical violence is defined as **intentional use of physical force with the potential for causing death, injury, or harm**. Physical violence includes, but is not limited to: scratching; pushing; shoving; throwing; grabbing; biting; choking; shaking; poking; hair pulling; slapping; punching; hitting; burning; and use of restraints or one's body, size, or strength against another person. Physical violence includes use of a weapon (gun, knife, or other object) against a person.

Sexual violence

Sexual violence is divided into three categories for the purposes of the MIPVSS ED component:

- 1) **Use of physical force to compel a person to engage in a sexual act** against their will (regardless of whether the act is completed).
- 2) An attempted or completed sex act involving **someone unable to understand the nature and/or condition of the act, decline participation, or communicate unwillingness** (e.g., due to disability or influence of drugs/alcohol).
- 3) **Abusive sexual contact** (i.e., intentional touching of a sexual nature against a person's will or against a person described in #2 above).

Intimate partner

- A current or former spouse;
- A current or former boyfriend or girlfriend (heterosexual or same-sex);
- An individual with whom a person has or had a dating relationship (i.e., relationships that have not yet attained boyfriend/girlfriend status (heterosexual or same-sex)); or
- An individual with whom a person has a child in common.

MEDCIIN/MIPVSS DESIGN

The Michigan Emergency Department Community Injury Information Network (MEDCIIN) is a passive, hospital ED data collection system implemented in 1999 in a sample of Michigan medical centers. Hospitals were selected according to a statistically valid random sampling design across eight regions and the City of Detroit^c; hospitals within each region are stratified by size and geography. Altogether, injury cases are generated by a sample of 23 hospitals. Hospitals in the MEDCIIN system provide MPHI with electronic files of specific data items from all emergency and urgent care department visits for injuries and assaults, including those that result in admission to the hospital.

Emergency departments are a primary source of contact for those victims of IPV who seek services.⁵ From the MEDCIIN database, assault and maltreatment cases of females age 16 and older seen in the EDs are identified. A list of these cases is then returned to the liaison at each hospital, and a designated staff person abstracts additional data items on all of these assault/maltreatment cases. The list of medical records returned to the hospital liaison is considered a list of *potential* cases of IPV against women. The chart review process determines which of these are truly such cases.

If it is determined that the patient is presenting due to physical and/or sexual violence (as defined above), the abstractor is asked to determine the nature of the relationship between the victim and perpetrator at the time the violence occurred. If it is determined that the victim-perpetrator relationship was that of intimate partners (as defined above), additional data items are collected. The case information is then sent to MPHI for processing. A cleaned dataset of IPV cases seen in the participating EDs during the calendar year is then provided to the Injury Prevention Section of MDCH for further analyses. Figure 1 provides a display of how the emergency department component of the MIPVSS operates.

^c The regions were those used at the time by the Michigan Health and Hospital Association.

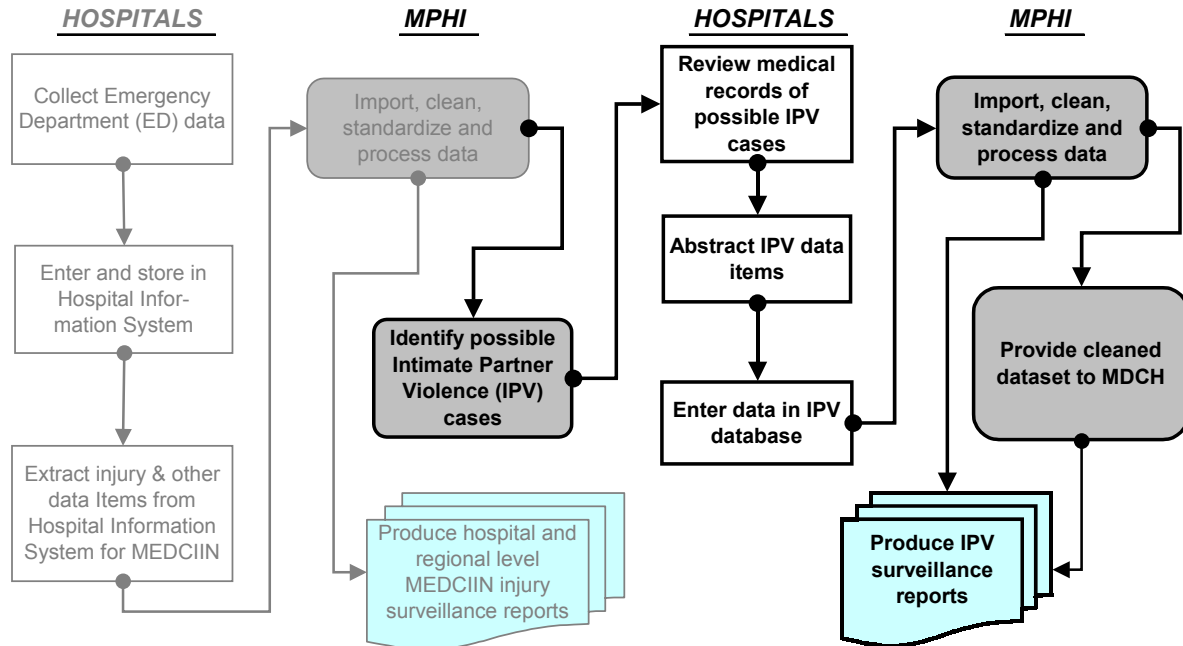


Figure 1. Flowchart of the MIPVSS hospital emergency department component

Hospital Characteristics

The MEDCIIN sample of hospitals consists of 23 community medical centers from around the state of Michigan. Participating hospitals in 1999-2000 included: **Alpena General Hospital, Borgess Medical Center, Bronson Vicksburg Hospital, Dickinson County Healthcare System, Genesys Regional Medical Center, Hayes Green Beach Memorial Hospital, Memorial Healthcare, William Beaumont Hospital**, and 15 additional hospitals that choose to remain anonymous at this time.

According to data provided by the Michigan Health and Hospital Association, approximately 63% of the hospitals statewide were located in urban areas from 1999-2000.^d Comparatively, 61% of hospitals in the MEDCIIN sample were in an urban setting. From 1999-2000, MEDCIIN hospitals reported an annual average of 37,149 ED visits per hospital. All other hospital EDs statewide reported an average of 23,609 visits during the same time period. The reason for this discrepancy between MEDCIIN and other hospitals dates back to when the original sample of hospitals was drawn. At the time, one large and non-large hospital (defined by number of ED visits) were selected in each region (at a minimum). However, there are many more non-large hospitals in Michigan, which decreases the overall statewide average for number of ED visits.

^d The distinction between urban and rural hospitals was based on whether or not a medical center was located within a Metropolitan Statistical Area (MSA).

RESULTS

Nineteen out of the 23 MEDCIIN hospitals (82.6%) provided data on identified cases of intimate partner violence (IPV) for the MIPVSS during the years 1999 and/or 2000.^c A total of 3,111 hospital charts of women with either a primary injury diagnosis indicating adult maltreatment or abuse or an E code^f for assault were reviewed. Of the 2,926 women for whom physical and/or sexual violence was confirmed via record review, 1,136 victims of IPV were identified through medical record documentation. The following displays characterize these IPV cases.

Victim characteristics

During 1999-2000, women ages 20-24 years presented to the sample of emergency departments because of IPV more often than any other age group^h (Table 1). The average age of IPV victims was somewhat older, however, at 30.9 years with a range from 16-81 years of age. Almost half of the identified victims (48.2%) were less than 30 years old.

Table 1. Age of female IPV victims, 1999-2000

Victim's Age	1999		2000		1999-2000		Cumulative Percent
	#	%	#	%	#	%	
16-19	48	(11.7)	80	(11.3)	128	(11.4)	11.4
20-24	77	(18.7)	146	(20.6)	223	(19.9)	31.3
25-29	75	(18.3)	114	(16.1)	189	(16.9)	48.2
30-34	71	(17.3)	110	(15.5)	183	(16.3)	64.3
35-39	69	(16.8)	114	(16.1)	183	(16.3)	80.6
40-44	38	(9.3)	84	(11.8)	122	(10.9)	91.5
45-49	20	(4.9)	39	(5.5)	59	(5.3)	96.8
50+	13	(3.2)	23	(3.2)	36	(3.2)	100.0
Total	411		711		1,121^g		

Table 2 provides a cross-tabulation of victims' race and ethnicity. Race/ethnicity data are difficult to interpret because most hospitals did not ask patients to identify their race; rather, a hospital staff member made the determination. Furthermore, all reporting hospitals listed "Hispanic" as a racial category rather than as an ethnicity; whether or not a woman was of Hispanic origin was unknown in more than three-quarters (76.8%) of the cases.

Table 2. Race/ethnicity of female IPV victims, 1999-2000

Victim's Race	Unknown Ethnicity (%)		Non-Hispanic Ethnicity (%)		Hispanic Ethnicity (%)		Total (%)	
Black	224	(20.5)	32	(2.9)			256	(23.5)
White	541	(49.6)	188	(17.2)			729	(66.8)
Other	4	(0.4)					4	(0.4)
Unknown	69	(6.3)	3	(0.3)	30	(2.8)	102	(9.4)
Total	838	(76.8)	223	(20.4)	30	(2.8)	1,091ⁱ	(100.0)

^c 16/23 hospitals in 1999 and 19/23 hospitals in 2000 provided IPV data for the system.

^f E codes classify environmental events, circumstances, and other conditions that cause injuries/adverse effects (St. Anthony's Updateable ICD-9-CM Code Book. Reston: St. Anthony Publishing, Inc.; 1996. E Codes; p. E1-E39).

^g Total does not sum to 1,136 because of missing data for some cases.

^h Although the age group '16-19 years' only covers four years, whereas the other age groups cover five, we feel that the inclusion of 15-year-olds would not likely elevate this group above the number of 20-24 year olds.

ⁱ Victims that were seen multiple times only contributed to race/ethnicity data once.

Proportions of victims who were ‘American Indian/Alaskan Native’ and ‘Asian/Pacific Islander’ are not specified because of an insufficient number of cases. Additionally, a substantial proportion of IPV victims in the sample were reported as race ‘Unknown’ (Table 2).

Victim-perpetrator relationship

Table 3 and Figure 1 refer to the relationship between the victim and perpetrator at the time the violence occurred. If multiple perpetrators were involved in the violence (which only occurred 2% of the time), data abstractors were asked to code the highest-ranking relationship type (with intimate partner relationships ranking higher than other types). While almost one-quarter (24%) of the women in the sample reported being abused by a current spouse, more than half (55%) were victimized by a current boyfriend (Table 3). In addition, approximately 14% of IPV victims described the perpetrator as a former boyfriend.

Table 3. Relationship of perpetrators to their female IPV victim, by cohabitation status, 1999-2000

<i>Relationship</i>	<i>Cohabiting (%)</i>		<i>Not Cohabiting (%)</i>		<i>Unknown (%)</i>		<i>Total (%)</i>	
	<i>Count</i>	<i>Percentage</i>	<i>Count</i>	<i>Percentage</i>	<i>Count</i>	<i>Percentage</i>	<i>Count</i>	<i>Percentage</i>
<i>Spouse</i>	203	(17.9)	12	(1.1)	58	(5.1)	273	(24.0)
<i>Separated spouse</i>	2	(0.2)	12	(1.1)	9	(0.8)	23	(2.0)
<i>Divorced spouse</i>			11	(1.0)	15	(1.3)	26	(2.3)
<i>Boyfriend</i>	152	(13.4)	60	(5.3)	412	(36.3)	624	(54.9)
<i>Former boyfriend</i>	10	(0.9)	67	(5.9)	80	(7.0)	157	(13.8)
<i>Current/former same-sex partner</i>	1	(0.1)	1	(0.1)	3	(0.3)	5	(0.4)
<i>Date</i>			3	(0.3)	1	(0.1)	4	(0.4)
<i>Unknown type of intimate partner</i>	3	(0.3)	4	(0.4)	17	(1.5)	24	(2.1)
<i>Total</i>	371	(32.7)	170	(15.0)	595	(52.4)	1,136	(100)

Cohabitation status (i.e., whether or not the victim and perpetrator were living together at the time of the ED visit) was unknown for many of the victim-perpetrator pairs (almost 53%), so it is difficult to comment on this variable with a high degree of certainty. Of the cases where cohabitation status was known, however, the victim and perpetrator were reported to be living together at the time in more than two-thirds (68.6%) of cases.

The distributions of the type of intimate partner responsible for perpetrating the violent act were quite different with respect to IPV victims’ age ($\chi^2 = 67.23$) (Figure 2). Younger women were more frequently assaulted by a current or former boyfriend than by a spouse. The average age of an IPV victim that was abused by a boyfriend was 29.9 years compared to 34.7 years for those who reported a spouse as the assailant.

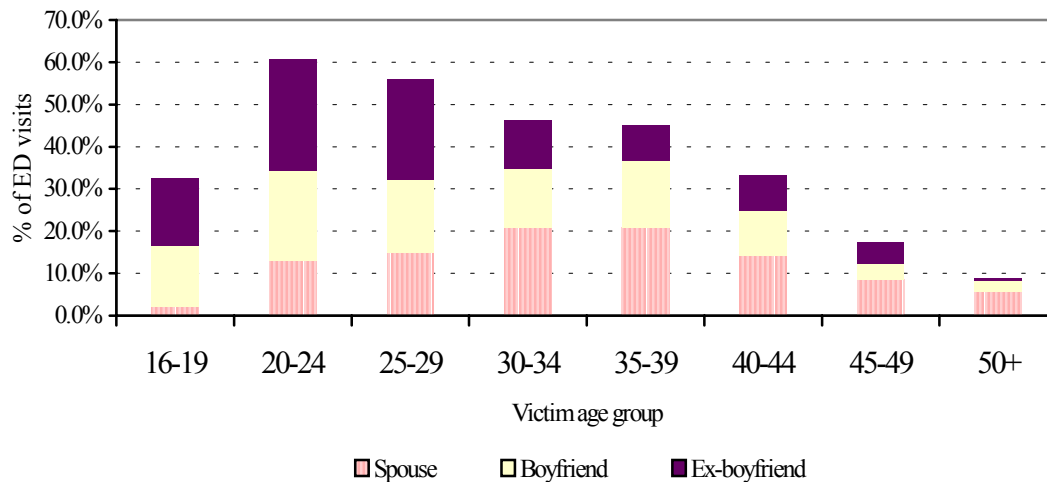


Figure 2. Prevalence of victim-perpetrator relationship types, by victim's age group, 1999-2000

Victims' injuries

On average, nine out of every ten (92%) victims in the sample had a primary diagnosis of injury.¹ The remaining IPV victims either had a non-injury primary diagnosis (see Table 6) or their diagnosis was unknown or missing. Table 4 provides a classification of medical diagnoses for IPV victims seen in the emergency department for whom the primary diagnosis was an injury. Overall (Table 4) and within age groups (Table 5), *abrasions/contusions, open wounds, and sprains/strains* were the three most common primary injury diagnoses among IPV victims.

Table 4. Female IPV victims' major classification of primary injury diagnosis, 1999-2000

<i>Primary diagnosis^j</i>	<i>Frequency</i>	<i>Percent</i>
Skull fracture/Intracranial injury	70	6.8
<i>Facial fracture^k</i>	45	
Neck/Trunk fracture	6	0.6
Upper limb fracture	22	2.1
<i>Wrist fracture</i>	6	
Lower limb fracture	7	0.7
Dislocation	3	0.3
Sprain/Strain	116	11.3
<i>Shoulder/Upper arm</i>	17	
<i>Wrist/Hand</i>	28	
<i>Back/Neck</i>	46	
Internal injury	5	0.5
Open wound	181	17.6
<i>Face/Head/Neck</i>	130	
Abrasion/Contusion	527	51.1
<i>Face/Scalp/Neck</i>	253	
Effect of foreign body (entering orifice)	1	0.1
<i>External Eye</i>	1	
Burn	3	0.3
Poisoning (drugs, medicinals, biologicals)	2	0.2
Toxic effects of non-medicinals	3	0.3
Other/unspecified	85	8.2
<i>Total</i>	1,031	100

^j Please refer to Appendix I for a description of the diagnostic categories.

^k Italicized diagnoses are subcategories of the previous diagnostic category.

¹ Primary injury diagnoses are those listed as the first diagnosis with the following ICD-9-CM codes: 800-994, 995.5x, or 995.80-995.85, excluding 905-909 (late effect), and 958 (early complication).

Table 5. Female IPV victims’ major classifications of primary injury diagnosis by age group, 1999-2000

Age Rank	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
1	Abrasion/ Contusion (52.6%)	Abrasion/ Contusion (50.0%)	Abrasion/ Contusion (50.6%)	Abrasion/ Contusion (48.2%)	Abrasion/ Contusion (49.4%)	Abrasion/ Contusion (54.5%)	Abrasion/ Contusion (58.5%)	Abrasion/ Contusion (56.3%)
2	Open wound (17.5%)	Open wound (17.8%)	Open wound (16.3%)	Open wound (20.6%)	Open wound (17.1%)	Open wound (16.1%)	Open wound (15.1%)	Open wound (18.8%)
3	Sprain/ Strain (12.3%)	Sprain/ Strain (11.9%)	Sprain/ Strain (12.9%)	Sprain/ Strain (10.6%)	Sprain/ Strain; Other/ Unspecified (10.0%)	Sprain/ Strain (10.7%)	Sprain/ Strain (11.3%)	Sprain/ Strain; Other/ Unspecified (6.3%)

The IPV victims’ primary injuries were consistently sustained in the upper body regions, specifically the head and neck areas (Figure 3).

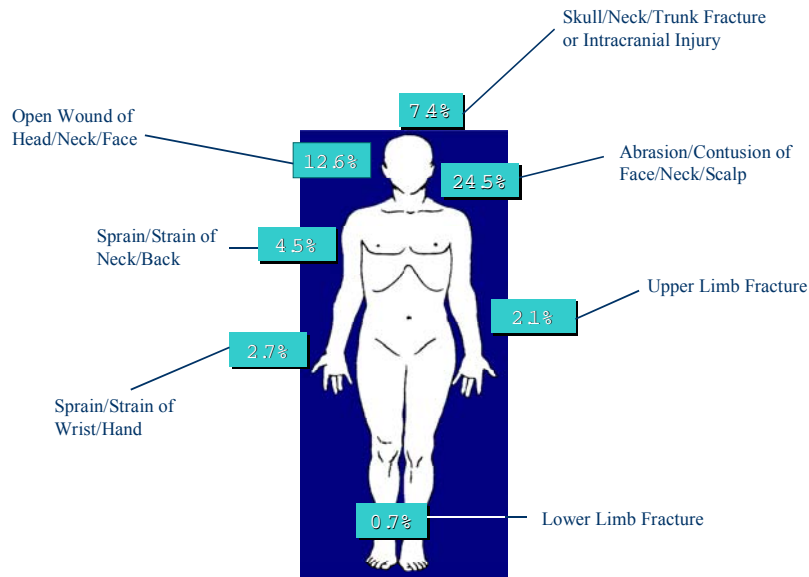


Figure 3. Female IPV victims’ primary injury diagnoses by body region, 1999-2000^{m, n}

^m Please note that percentages do not sum to 100.0 because not all injury diagnoses were specific enough to delineate the body region of the injury.

ⁿ Figure adapted with permission from the Injury Prevention Service, Oklahoma State Department of Health.

Table 6 presents a classification of primary diagnoses for IPV victims for whom the primary diagnosis was *not* that of an injury, but who had a diagnosis code of adult abuse or maltreatment or an assault-related E code in their record.

Table 6. Female, non-injury IPV victims' major classification of primary diagnosis, 1999-2000

Primary Diagnosis	Frequency	Percent
Diseases of the musculoskeletal system/connective tissue	20	22.5
<i>Other and unspecified disorders of the back^o</i>	9	
Symptoms/signs/ill-defined conditions	19	21.3
<i>Chest pain</i>	9	
<i>Headache</i>	4	
Complications of pregnancy/childbirth/puerperium	16	18.0
Mental disorders	9	10.1
<i>Neurotic disorders/personality disorders/ other non-psychotic mental disorders</i>	6	
<i>Psychoses</i>	3	
Diseases of the digestive system	6	7.1
Disorders of the eye & adnexa	4	4.5
Other non-injury diagnoses	15	11.9
Total	89	100.0

Causes of injury or other adverse effects

E codes classify environmental events, circumstances, and other conditions that cause injuries or other adverse effects.^f Table 7 presents a classification of these external causes for victims captured by the MIPVSS.^f Overall (Table 7) and within age groups (Table 8), the most common causes of injury/adverse effects were *being struck by/against*, *battering/maltreatment/neglect*, and *other specified* determinants.

Table 7. Female IPV victims' causes of injury or other adverse effects, 1999-2000

Mechanism^p	Frequency	Percent
<i>Struck By, Against</i>	453	40.6
<i>Battering, maltreatment, neglect</i>	275	24.7
<i>Cut/Pierce</i>	41	3.7
<i>Rape</i>	11	1.0
<i>Poisoning</i>	5	0.5
<i>Fall</i>	5	0.5
<i>Transport</i>	4	0.4
<i>Fire/Hot Substances</i>	1	0.1
<i>Motor Vehicle Traffic</i>	1	0.1
<i>Overexertion</i>	1	0.1
<i>Suffocation/hanging/strangulation</i>	1	0.1
<i>Crushed between</i>	1	0.1
<i>Other Specified & Classifiable</i>	157	14.1
<i>Other Specified & Not Classifiable</i>	108	9.6
<i>Unspecified</i>	51	4.6
Total	1,115^q	100.0

^o Italicized diagnoses are subcategories of the previous diagnostic category.

^p Please see Appendix II for a description of mechanism of injury/other adverse effects categories.

^q Total does not sum to 1,136 because of missing data for some cases.

^r In cases where there are two or more E codes, the first E code (considered the primary E code) is used to generate the cause of injury/adverse effects variable.

If an applicable E code exists indicating the *cause* of an individual’s injury, poisoning, or other adverse effects, it is supposed to be used in conjunction with a diagnosis code that indicates the *nature* of the person’s condition.^f However, one specific E code, ‘E967.3’ (‘Child and adult battering/maltreatment by spouse or partner’), is technically only to be used as a secondary E code for injury cases. Some medical record coders use it if there is mention of partner violence in the medical record, even if the victim does not have an injury but is in the ED for some other complaint. It is also sometimes used as the primary E code if there is an injury. Among the IPV victims whose mechanism of injury was *battering/maltreatment/neglect*, code ‘E967.3’ was correctly used as a secondary E code in 60% of cases and incorrectly used as the primary E code in 20.4% of the cases.

Table 8. Female IPV victims’ leading causes of injury or other adverse effects by age group, 1999-2000

Age Rank	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50+
1	Struck by, against (43.8%)	Struck by, against (45.1%)	Struck by, against (39.4%)	Struck by, against (38.3%)	Struck by, against (40.3%)	Struck by, against (36.1%)	Struck by, against (37.3%)	Struck by, against (39.5%)
2	Battering, maltreatment, neglect (15.6%)	Battering, maltreatment, neglect (22.5%)	Battering, maltreatment, neglect (23.9%)	Battering, maltreatment, neglect (29.4%)	Battering, maltreatment, neglect (25.4%)	Battering, maltreatment, neglect (29.5%)	Battering, maltreatment, neglect (25.4%)	Battering, maltreatment, neglect (28.6%)
3	Other specified & classifiable (13.3%)	Other specified & classifiable (11.3%)	Other specified & classifiable (14.9%)	Other specified & classifiable (16.7%)	Other specified & classifiable (14.9%)	Other specified & classifiable (13.9%)	Other specified & classifiable (18.6%)	Other specified & not classifiable (11.4%)

Temporal characteristics

Thirteen hospitals submitted full-year IPV data for 1999 (n=336), and 18 submitted full-year data for 2000 (n=695). IPV visits to the emergency department of the 13 hospitals that submitted full-year data during 1999 and 2000 (n=742) were highest during late spring and early summer (Figure 4).

The 13 hospitals that submitted full-year data for both years saw the most IPV victims on the weekends (Figure 5). On average, the frequency of IPV visits was fairly constant from noon until the very early morning hours, then tapered off during the remainder of the morning (Figure 6).

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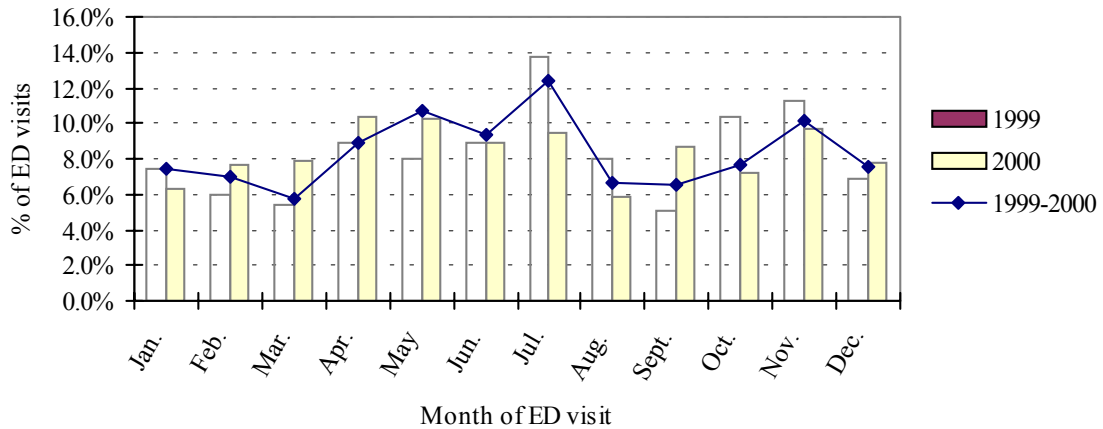


Figure 4. Female IPV victims and month of ED visit, 1999-2000

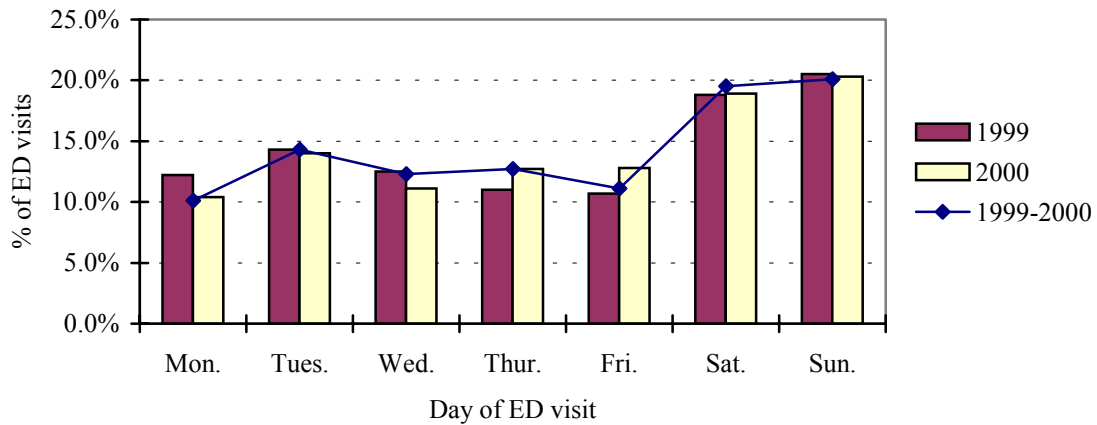


Figure 5. Day of ED visit, female IPV victims, 1999-2000

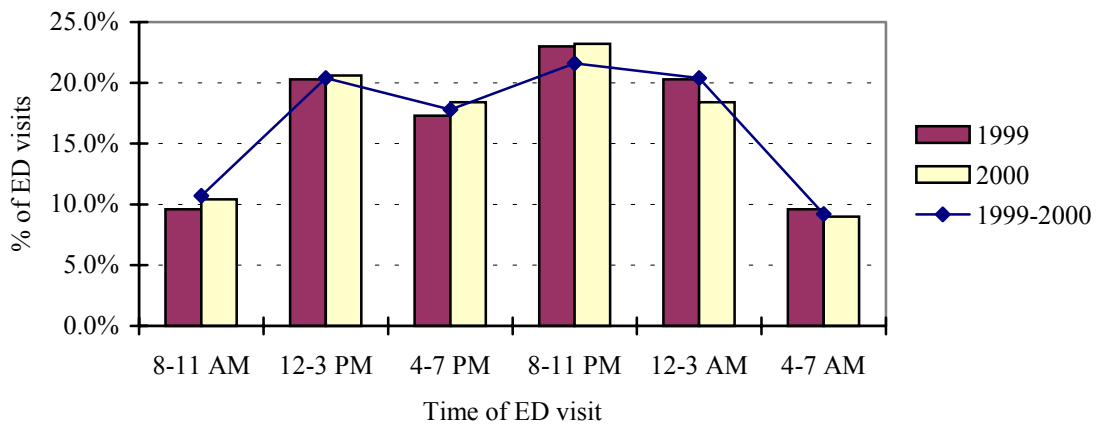


Figure 6. Time of day admitted to the ED, female IPV victims, 1999-2000

Of the 42 different day-and-time slots (seven days by six time brackets) that IPV victims could have been admitted to the emergency department, just two slots accounted for approximately 10% of the visits: *late Saturday evening* (8:00-11:00 PM) continuing into *very early Sunday morning* (12:00-3:00 AM) (Figure 7).

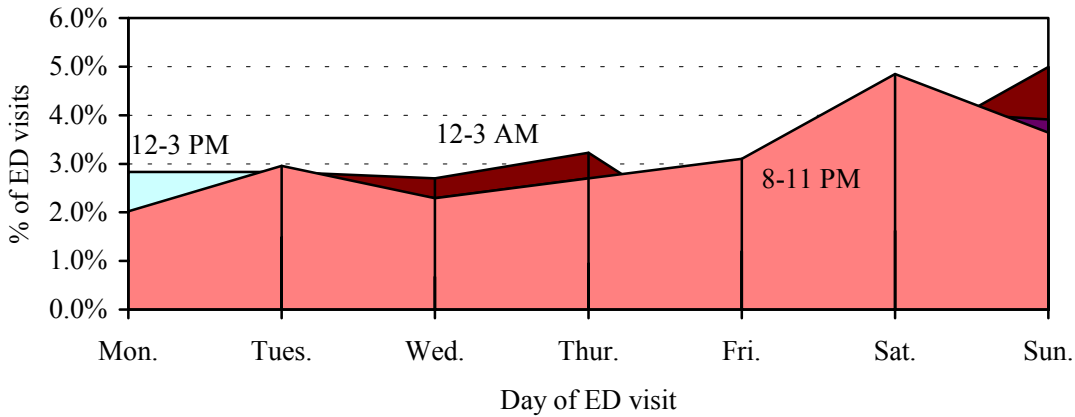


Figure 7. Female IPV victims and most frequent time of day admitted to the ED, by day of week, 1999-2000

Payment source

The three expected primary sources of payment most frequently reported by IPV cases were an insurance company (38.2%), Medicaid (29.7%), and self-pay (25.3%) (Figure 8). The payment source category ‘Other’ includes contributions such as ‘Workers’ compensation’ and ‘Other government payments.’

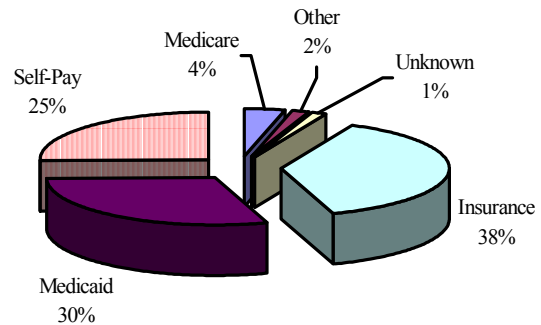


Figure 8. Primary source of payment for medical care, female IPV victims, 1999-2000

The distributions of the type of payment sources IPV victims planned to use for their medical care were quite different with respect to victims’ age ($\chi^2 = 10.08$) (Figure 9). IPV victims who were in their twenties tended to report Medicaid and self-pay as their form of medical care payment more often than they claimed an insurance company. The mean age of IPV victims using particular payment sources was as follows: private insurance=31.5 yrs.; self-pay=30.8 yrs.; and Medicaid=29.4 yrs.

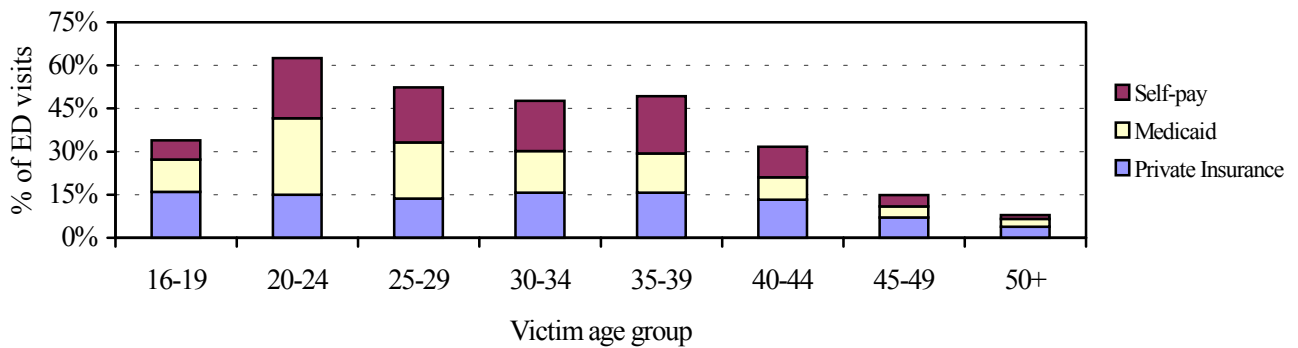


Figure 9. Prevalence of medical care payment source utilized by victims, by victim's age group, 1999-2000

Police involvement

Documentation in medical records showed that police were already involved in at least one third (34.5%) of the IPV cases before the women came to the hospital (Table 9). The hospital contacted law enforcement in at least another 40%.

Table 9. Female IPV victimization and hospitals' reporting to police, 1999-2000

<i>Whether Police Were Involved</i>	<i>Frequency</i>	<i>Percent</i>
<i>Law Enforcement Agency Contacted by Hospital</i>	449	39.5
<i>Law Enforcement Agency Already Involved</i>	372	32.8
<i>Agency Contacted by Hospital and Already Involved</i>	20	1.8
<i>Law Enforcement Agency Not Contacted by Hospital</i>	123	10.8
<i>Unknown Whether Agency Contacted/Not Mentioned</i>	172	15.1
<i>Total</i>	1,136	100.0

Additional findings

Other findings from the 1999-2000 emergency department data in the MIPVSS include:

- Almost all of the patients in the sample (96.7%) were discharged home (as is typical of most cases seen in the emergency department).^s
- Physical violence alone was confirmed in 96.6% of the cases reviewed, sexual violence alone in 0.9% of the cases, and both forms of assault in 2.3% of cases.
- The number of children (the victim's or someone else's) under age 18 living with the victim at the time of the ED visit was not documented in approximately four out of every five cases reviewed (81.8%).


^s For some reporting hospitals, final disposition *from the hospital* rather than disposition from the emergency department was reported, resulting in some patients who were admitted to the hospital being reported as discharged home.

- Data on other variables collected for the MIPVSS were also not presented in the previous displays due to high percentages of unknown information. For example:
 - Whether ED staff referred the victim to a hospital human service worker (i.e., a social worker, chaplain, or nurse case manager) was unknown almost one-third of the time (32.4%).
 - It was unknown almost half of the time (44.4%) if the victim was referred to a domestic violence agency (this includes a shelter, a domestic violence program, or a support group), a sexual assault agency (such as a rape crisis center), or both of these.
 - Whether a safety plan was offered to the patient (i.e., a more detailed discussion than just asking if the victim has a safe place to stay) was unknown in almost half of the cases (47.5%).

DISCUSSION


This is the first report to present information on emergency department visits due to intimate partner violence from a large sample of hospitals in Michigan. Overall, the MIPVSS identified a total of 1,136 intimate partner violence victimizations from 1999-2000. From the nineteen hospitals in the MIPVSS that submitted data in 1999 and/or 2000 on assault cases against women aged sixteen and older, 39% of the assaults (39.2% in 1999 and 38.7% in 2000) were identified as IPV incidents. Because of diverse study methodologies, differing case definitions, and small sample sizes, it is extremely difficult to locate published findings with which to compare this percentage. For example, the Study of Injured Victims of Violence (SIVV)[†] similarly found that intimate partners wounded 37% of female ED patients with violence-related injuries.⁶ But directly comparing these findings with MIPVSS results is inappropriate, because the SIVV included persons under 16 years old. An emergency department-based study in New Zealand similar to the MIPVSS with almost identical age criteria did, however, find that a current or former intimate partner perpetrated 32% of assaults against women that resulted in injury.⁷

It is highly unlikely that a single, statewide surveillance system could successfully collect information from all of the medical services that IPV victims use. Even though hospital emergency departments represent just *one* of the many settings that victims might turn to for help, the MIPVSS does provide valuable information on numerous variables related to intimate partner violence.


 The average age of identified IPV victims in the MIPVSS for 1999-2000 was 31 years old, almost identical to that reported by Kyriacou and colleagues for female domestic violence victims identified in the ED.⁸ Although the age range of the MIPVSS sample went all the way up to 81 years old, women ages 50 years and older constituted a very small proportion of cases (3.2%). However, this does not necessarily mean that older women are at lower risk of abuse. For example, it has been reported that when both physical violence and non-physical forms of abuse are combined into one measure of IPV, the rate of intimate


[†] The SIVV is a supplement to the nationally representative sample of hospitals EDs included in the National Electronic Injury Surveillance System (NEISS).


partner violence is similar across women of all ages.⁹ Furthermore, women ages 45-64 years in the U.S. made substantially fewer visits to hospital emergency departments because of intentional injuries during 1999-2000 (40.5 injury-related visits per 10,000 persons) than women ages 18-24 years (166.8 injury-related visits per 10,000 persons).¹⁰


 A current boyfriend was the most frequently reported perpetrator during 1999 and 2000 in the MIPVSS ED data. Given that the majority of women who presented to the hospital EDs were relatively young (e.g., 20-24 years old), it is not surprising that current boyfriends outnumbered spouses by more than a two-to-one ratio (2.3:1). In fact, almost one-third of the women in Michigan that have never been married or are widowed or divorced (and therefore theoretically qualified to report a boyfriend as a perpetrator in instances of IPV) are 15 to 24 years old, compared to the four percent that this same age group represents among now married women.¹¹


Leaving the intimate partner does not always put an end to the violence, however.^{1,12,13} Former intimate partners were reported to be the perpetrator in almost one out of five victimizations (18.4%), and they figured quite prominently into the maltreatment of younger women (**Figure 2**).


 Most IPV victims' primary injuries appeared to be relatively minor, including such injuries as abrasions/contusions, open wounds, and sprains/strains. Tjaden and Thoennes¹ surveyed women and similarly found that the majority of respondents who were injured during their most recent IPV victimization sustained what the MIPVSS classifies as abrasions/contusions (i.e., scratches, bruises, and welts). The practical value of having information on victims' injuries is the ability to map these insults by body region (**Figure 3**). For example, one quarter of the IPV victims' primary injuries were abrasions/contusions of the face/scalp/neck, a presentation that is typical of battered women.¹⁴ There are future plans to compare MIPVSS data with that from the overall MEDCIIN system and search for significant differences between IPV victims and all other female injury cases. This information could prove useful in supplying healthcare providers with possible "markers" of IPV to be aware of when assessing patients with injuries.

 Injuries are not the most common physical consequence of intimate partner violence. A collection of ailments of unknown cause(s) termed "functional disorders" is more prevalent.¹⁵ Although the majority of incidents described in this report involved injuries to the victim (due to the surveillance setting and case selection criteria), approximately 9% of the women presented with other adverse effects, including symptoms, signs, and ill-defined conditions that could be considered functional disorders. It has been suggested that when a public health perspective is taken toward violence surveillance, care should be taken not to overlook these non-injury related health effects.¹⁶ Even though the range of health-related consequences associated with IPV is more extensive than what the MIPVSS was designed to capture, the unique ability of this surveillance system to capture and depict some of the non-injury health effects of IPV seen in the hospital ED illustrates its utility in describing outcomes of IPV.

 It appears as though case identification improved slightly during the first two years of the MIPVSS. There were 21% more cases total reported during year 2000 than in 1999 from hospitals that submitted full-year data for both years, with ten hospitals identifying at least the same number of cases or more during the second year. The disparities between the two years in the proportion of IPV cases seen per month (**Figure 4**) is likely due to variation within hospitals by year of data submission. Therefore, the line depicting the proportion of IPV cases seen per month (Figure 4) should become less a function of hospital participation and more stable as institutions continue to participate in the MIPVSS. That is to say, the proportion of IPV cases per month should stabilize across years as hospitals continue to take part in the system and efforts are continually made to improve staff awareness and identification of intimate partner victimization.

 Compared to month of ED visit, data on time and day of visit to the emergency department for IPV victims are more precise temporal measures. Figures 5-7 have potential implications related to educating hospital ED staff about when IPV victims might be more likely to appear for treatment. However, it is possible that peak days and times for IPV visits may simply reflect more intense screening by ED staff. As was previously mentioned, there are future plans to compare MIPVSS data with that from the more comprehensive MEDCIIN system and search for significant differences between the patients seen by each system (e.g., whether or not IPV victims are more likely than all other female injury patients to present to the ED during certain times of day/days of week).

 Intimate partner violence incidents in which victims require medical attention tap into the financial resources of various parties, including victims themselves, subsidized state and federal health care plans, private insurance companies, and employers. For example, government estimates place the annual direct and indirect costs to employers of domestic violence somewhere between \$3 and \$5 billion.^{17,18} Most of the victims identified by the MIPVSS reported that an insurance company was the expected primary source of payment for medical costs incurred while at the hospital, despite the fact that ED use is greater among non-elderly U.S. adults covered by Medicaid than among the privately insured.¹⁰ Those relying on Medicaid and self-payment tended to be younger than women reporting private insurance, which seems to indicate that these younger women may have been of lower socioeconomic status than other victims. There are several possible explanations for why a substantial proportion of victims (25%) planned to pay for costs themselves, including: the fear of what might happen should an insurance provider notify her employer (assuming the woman actually had employer-sponsored insurance); not wanting her partner to discover she sought treatment (e.g., if related paperwork was mailed to the victim and found by the perpetrator); or she may be one of the many “working poor”—those individuals who are employed, but un- or underinsured in this country. Additionally, it is not surprising that Medicare was reported as the source of payment so infrequently given that very few victims were ages 65 or older.

 In Michigan, hospitals are mandated by MCL 750.411 to notify a law enforcement agency immediately if a person presents to their institution with an injury or wound attributable to violence.¹⁹ However, 11% of the violent incidents captured by the MIPVSS

involving a primary diagnosis of injury were documented as not having been reported to law enforcement by the hospital ED staff; it is not known whether law enforcement was contacted in another 15% of cases. Houry et al.²⁰ also discovered sub-optimal levels of documentation regarding police involvement in domestic assault cases identified in the ED. Some of the concerns that have been raised about mandatory reporting of this type of violence include that it may "...threaten the safety of battered women, discourage them from seeking care, fail to improve the health care of battered patients, lead to inadequate responses to reports of abuse, result in biased case identification, and violate patient autonomy and confidentiality."²¹ There are future plans to poll hospitals' ED staff responsible for MIPVSS data abstraction, and one of the questions to be asked involves reporting IPV incidents to police.

LIMITATIONS

The hospital component of the MIPVSS obtains its data from a voluntary surveillance system—MEDCIIN. Because participation in MEDCIIN is voluntary, hospitals that have agreed to take part could differ on certain characteristics from other hospitals in Michigan that have emergency departments. However, since this report does not provide any statewide estimates generated from the MIPVSS, a detailed discussion of how contributing hospitals compare to all other hospitals statewide is not necessary at this time. Worth noting, however, is that for 1999-2000 IPV data were not available from two of the MEDCIIN hospitals located in the largest urban area in the state.

As was mentioned earlier, race/ethnicity data from the MIPVSS sample of women is potentially unreliable because it was obtained via hospital staff members' observations. Self-classification of race/ethnicity compared with classification by an observer in large samples has demonstrated high consistency for Whites and Blacks, but the most occurrences of false categorization for American Indians.^{22,23} Despite the fact that most victims in the sample were classified as either White or Black, we decided not to use race/ethnicity data for further analyses and inferences. Additionally, although the large proportion of cases that were missing information precluded further analyses with the cohabitation variable, its role as a significant predictor of partner violence has not been confirmed by previous findings.^{8,24}

One of the variables the MIPVSS currently collects information on is *date of ED visit*. Abbott²⁵ previously pointed out the importance of determining whether a DV victim's presentation to the ED was directly caused by the acute incident, or if DV was a contextual part of the victim's life and may or may not have contributed to her arrival at the ED that day. Recording the date the violent episode occurred would be the optimal time dimension to help address this determination, but the MIPVSS currently uses date of visit for the purpose of simplicity. Although we cannot definitively quantify the amount of time lapse between incident occurrence and presentation to the hospital, it seems unlikely that the majority of victims seen were there because of non-acute incidents. In fact, acute trauma-related partner violence may be the most crucial type to detect (as the MIPVSS does), because it likely identifies patients at increased risk of upcoming re-victimization.²⁵ Wadman and Muelleman²⁶ discovered that of 34 female, domestic violence

homicide victims in Missouri, more than 40% had presented to an ED with injuries during the two years preceding their homicide.

Public health surveillance systems (such as the MIPVSS) normally must strike a balance between the desire to detect all cases of a given condition and the amount of effort required to sort through the false-positives.²⁷ One way to decrease the number of false-positives encountered is to have well-defined, restrictive case selection criteria. As a part of the MIPVSS' selection criteria, MPHI filters out non-injury and non-assault cases before chart review in an effort to detect as many IPV cases as possible without having to review every woman's ED record. Because every single record is not reviewed it is likely that some IPV victims seen at participating hospital are undetected by the MIPVSS. However, the authors feel that the current case selection criteria maximize the proportion of true IPV cases that are identified as such, while reducing effort needed to uncover false-positives.

But before victims can be identified by the MIPVSS, they must first be screened for intimate partner violence by hospital staff. Routine screening of all women presenting to emergency departments has been widely recommended.^{28,29,30,31} However, these recommendations are not always followed. For example, some ED staff may not feel comfortable screening older women for signs of victimization by an intimate partner. MIPVSS program staff will continue to stress the importance of universal screening for IPV to all emergency department staff involved in the surveillance system.

It is possible that some of the cases in the MIPVSS database are indeed false-positives, which represents a form of misclassification error. For example, a staff person responsible for IPV data abstraction at a participating hospital might incorrectly interpret the nature of the relationship between the victim and perpetrator. In an effort to detect these types of errors, the VAW Prevention Program Director has been re-abstracting 30 IPV cases at each hospital in the system. The data gathered from this effort will provide an evaluation of how well the hospital abstractors are doing not only detecting cases in general, but also how accurately they are reporting information on specific variables.

FUTURE DIRECTIONS

Most estimates obtained on self-reported IPV victimization identified in the health care setting (e.g., emergency departments), including those from the MIPVSS, are felt to be underestimates of actual occurrence.¹⁶ There are a number of possible explanations for this undercount, over and above reluctance on the part of patients to disclose IPV, several of which the MIPVSS' staff hopes to improve upon for future years' data, including:

Hospitals' E-coding levels → If an assault-related injury case in the MEDCIIN system is not E coded by the hospital medical records department, unless it has a maltreatment diagnoses code it is not possible to identify it for further data abstraction as a potential IPV case. E coding rates varied dramatically among the MEDCIIN hospitals in 1999-2000, from a low of 1.1% at one

hospital^u to a high of 99% at another. MPHI staff are working constantly with the hospitals on improving their E coding rates.

Availability of information in the medical record → Data for some variables are typically not found in medical records. For example, from 1999-2000 the victim-perpetrator relationship (which is essential for identifying IPV cases) was unknown in approximately one quarter (24%) of the adult female assault and maltreatment cases. Although this proportion is certainly better than the two-thirds of cases missing assailant's identity in a study by Houry et al.²⁰, there is much room for improvement. Because of this, the documentation component of the training for emergency department staff offered as part of the MEDCIIN/MIPVSS program is being enhanced.

ED staff awareness → It has become apparent in working with the hospitals in MEDCIIN/MIPVSS and their medical records that hospital staff still have difficulty identifying IPV survivors and appropriately documenting those cases. MIPVSS program staff will continue to be involved in an ongoing effort to train emergency department staff in identification, intervention, and documentation for cases of intimate partner violence. Because there is much research going on in the area of medical care screening and intervention, these trainings will be constantly upgraded as more information becomes available on what constitutes the best care for survivors

Technical Notes

The SAS **NPARIWAY** procedure compares the centers of two or more distributions. This procedure is appropriate when continuous data are not normally distributed. The **WILCOXON** option generates the Kruskal-Wallis statistic (χ^2) when there are more than two groups to be compared.^v Wilcoxon scores are the ranks of the observations.^w

$$a(R_j) = R_j$$

^u Although all of the E coded cases were assaults or of undetermined intent

^v Elliott RJ. Learning SAS in the Computer Lab. 2nd ed. Canada: Duxbury Press; 2000.

^w SAS Institute Inc. SAS/STAT User's Guide, Version 8. Cary, NC: SAS Institute Inc.; 1999.

APPENDIX I. DESCRIPTION OF DIAGNOSTIC CATEGORIES

Diagnostic Category	ICD-9-CM Codes	Special Notes
Skull Fracture/Intracranial Injury	800-804, 850-854	
<i>Facial Fracture</i>	<i>802</i>	
Neck/Trunk Fracture (w/out spinal cord injury)	805, 807-809	Excludes: fractures with a spinal cord injury
Spinal Cord Injury	806, 952	Includes: fractures with spinal cord injury
Upper Limb Fracture	810-819	
<i>Wrist Fracture</i>	<i>814, 813.4, 813.5</i>	<i>Includes: fractures of carpal bones and an open or closed fractures of lower end of radius and ulna</i>
Lower Limb Fracture	820-829	
<i>Hip Fracture</i>	<i>820</i>	<i>Includes: fractures of neck of femur</i>
Dislocation	830-839	
Sprain/Strain	840-848	
<i>Back</i>	<i>846, 847.1, 847.2, 847.3, 847.9</i>	<i>Includes: sprains/strains of the following regions: sacroiliac, thoracic, lumbar, sacrum, and unspecified sites of back</i>
Internal	860-869	
Open Wound	870-897	
<i>Face/Head/Neck</i>	<i>870-874</i>	
<i>Amputation of Limb</i>	<i>885-887, 895-897</i>	<i>Includes: amputation of thumb, finger, arm, hand, toe, foot, and leg</i>
Abrasion/Contusion	910-924	Includes: superficial injuries and contusions with intact skin surface
<i>Face/Scalp/Neck</i>	<i>910, 918, 920, 921</i>	
Foreign Body (entering through orifice)	930-939	Excludes: foreign body penetrating open wound
<i>External Eye</i>	<i>930</i>	<i>Excludes: foreign body penetrating wound of eye</i>
Burn	940-949	
Toxic Effects of Drugs, Medicinal and Biological Substances	960-979	Includes: overdoses and wrong substances given/taken Excludes: adverse effects/reactions
Toxic Effects of Non-medicinal Substances	980-989	Excludes: burns from ingested chemical agents
<i>Carbon Monoxide Poisoning</i>	<i>986</i>	
Other/Unspecified	925-929, 950-951, 953-957, 959,	Includes: crushing injuries, injuries to nerves other than spinal cord, and other and unspecified injuries

Note that *grey indented italicized* diagnoses are subcategories of the previous diagnostic category.

APPENDIX II. DESCRIPTION OF MECHANISM OF INJURY CATEGORIES

Mechanism	ICD-9-CM E-codes					Special Notes
	Unintentional	Self-inflicted	Assault	Undetermined	Other	
Cut/Pierce	E920	E956	E966	E986	E974	Other indicates legal intervention
Drowning/ Submersion	E830, E832, E910	E954	E964	E984		
<i>Boat-related</i>	<i>E830, E832</i>					
<i>Non-boat</i>	<i>E910</i>					
Boat-related Non-drowning	E831, E833-E838					
Fall	E880-E886, E888	E957	E968.1	E987		
Fire or Hot Substances	E890-E899, E924	E958.1, E958.2, E958.7	E961, E968.0, E968.3	E988.1, E988.2, E988.7		
<i>Fire/Flame</i>	<i>E890-E899</i>	<i>E958.1</i>	<i>E968.0</i>	<i>E988.1</i>		
<i>Hot Objects/ Substances</i>	<i>E924</i>	<i>E958.2, E958.7</i>	<i>E961, E968.3</i>	<i>E988.2, E988.7</i>		
Firearm	E922	E955.0- E955.4	E965.0- E965.4	E985.0- E985.4	E970	Other indicates legal intervention
Machinery	E919					Excludes: explosions, electric currents, machinery not in operation.
Motor Vehicle Traffic	E810-E819	E958.5		E988.5		Assault by motor vehicle is included under "Transport, other", below.
<i>Occupant</i>	<i>(").0 or .1</i>					<i>Unintentional Motor Vehicle Traffic accidents are in the range E810-E819 with a 4th digit to specify the injured person.</i>
<i>Motorcycle</i>	<i>(").2 or .3</i>					
<i>Pedalcyclist</i>	<i>(").6</i>					
<i>Pedestrian</i>	<i>(").7</i>					
<i>Other Specified</i>	<i>(").4,.5,.8</i>					
<i>Unspecified</i>	<i>(").9</i>					
Snowmobile, Other	E820					Excludes: accidents involving motor vehicle traffic
Pedalcycle, Other	(E800-E807).3, (E821-E825).6, E826, (E827-E829).1					Excludes: accidents involving motor vehicle traffic and snowmobiles
Pedestrian, Other	(E800-E807).2, (E821-E825).7, (E826-E829).0					Excludes: accidents involving motor vehicles, snowmobiles, and bicycles
Transport, Other	(E800-E806).0,.1, .8,.9	E958.6	E968.5	E988.6		Excludes: accidents involving water vehicles, motor vehicle traffic, snowmobiles, bicycles, and pedestrians Includes: rail, motor vehicle non-traffic, other road vehicles, air and space Assault category includes: struck, run down, pushed in front of, thrown from, or dragged by moving vehicle Self-inflicted and Undetermined categories include: crashing of aircraft

Mechanism	ICD-9-CM Codes					
	Unintentional	Self-inflicted	Assault	Undetermined	Other	
Natural/ Environmental	E900-E909, E928.0- E928.2	E958.3		E988.3		
<i>Bites & Stings</i>	<i>(E905).0-.6,.9, (E906).0-.4,.9</i>					
<i>Other</i>	<i>others in above range</i>					
Overexertion	E927					
Poisoning	E850-E869	E950-E952	E962	E980-E982	E972	Other indicates legal intervention
Struck By, Against	E916-E917		E960.0, E968.2		E973, E975	Other indicates legal intervention
Suffocation/ Hanging/ Strangulation	E911-E913	E953	E963	E983		
Other Specified & Classifiable	E846-E848, E914-E915, E918, E921, E923, E925- E926, E928.0- E928.2	E955.5- E955.9, E958.0, E958.4	E965.5- E965.9, E967, E968.4, E968.6	E985.5, E985.6, E988.0, E988.4	E971, E978, E990-E994, E996, E997.0- E997.2	Includes: accidents involving non-transport and elsewhere classifiable vehicles; foreign body entering orifice; caught between objects; explosions of pressure vessels, explosive materials, bombs; electrocution; exposure to radiation, weightlessness, noise and vibrations; jumping/lying before moving object; child/adult battering and maltreatment; and assault by airgun. Other indicates legal intervention and war operations.
Other Specified & Not Elsewhere Classifiable	E928.8	E958.8,	E968.8	E988.8	E995, E997.8, E998	Includes other specified injuries of following types: environmental, self-inflicted, assault, undetermined, and war operations,
Unspecified	E887, E928.9	E958.9	E968.9	E988.9	E976, E997.9	
Adverse Effects/Events <i>Medical Care</i> <i>Drugs</i>					E970-E978, E930-E949, <i>E870-E897</i> <i>E930-E849</i>	

Note that grey shading indicates that there are no codes possible within a specified classification. *Indented italicized grey* mechanisms of injury are subclassifications of previous mechanism category. Late effect codes are not included because cases with late effect codes have been removed.

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