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Violence-Related Injuries Treated in Hospital Emergency Departments

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During 1994 U.S. hospital emergency department (ED) personnel treated an estimated 1.4 million people for injuries from confirmed or suspected interpersonal violence. These patients represented about 1.5% of all visits to hospital ED's and 3.6% of the injury-related ED visits in 1994.¹ Of the total, 1.3 million were treated for injuries from confirmed violence, while 82,000 sought care for injuries that had probably been — or were suspected of having been — sustained from acts of violence.

Based on information from the patients or knowledgeable persons accompanying the patients, 94% of the persons treated for intentional or possibly intentional injuries sustained those injuries in an assault. About 31% of those injured during an assault — or 29% of all those injured — indicated being injured in a fight. Two percent were injured during a completed or attempted robbery, and 5% were injured by an offender during a completed or attempted rape or sexual assault.

¹Centers for Disease Control, *Hospital Ambulatory Medical Care Survey: 1994 Emergency Department Summary Advance Data*, 275, May 17, 1996.

Highlights

- Among the estimated 1.4 million hospital emergency department (ED) patients treated in 1994 for nonfatal injuries sustained in intentional or possibly intentional violence —
 - 94% were injured during an assault.
 - 2%, during a robbery.
 - 5%, by an offender in a rape or sexual assault.
- Males were three-fifths of all persons treated in ED's for injuries sustained in violence. Persons under age 25 were about half.
- Blacks, who constitute about 13% of the population, represented 24% of those treated for violence-related injuries.
- Of all persons treated for violence related injuries —
 - 7% had been injured by a spouse or ex-spouse.
 - 10%, by a current or former boyfriend or girlfriend.
 - 8%, by a parent, child, sibling, or other relative.
 - 23%, by a friend or acquaintance.
 - 23%, by strangers.In almost 30% of all cases in the study, the relationship of the person inflicting the injury to the patient was not recorded for the study.
- A higher percentage of women than men were treated for injuries inflicted by an intimate — a current or former spouse, boyfriend, or girlfriend. Men were more likely than women to be treated for injuries caused by nonrelatives: acquaintances and strangers.
- The estimated number of persons treated in ED's for injuries inflicted by intimates was 4 times higher than estimates from the National Crime Victimization Survey, an ongoing household survey.
- People injured in violence were treated for a variety of injuries:
 - 34% for bruises or similar injuries
 - 31% for cuts, stab wounds, or internal injuries
 - 17% for fractures, sprains, dislocations, dental injuries, or other muscular/skeletal injuries
 - 5% for gunshot injuries
 - 5% for rapes/other sexual assaults
 - 4% for concussions or other head injuries
 - 5% for other injuries.
- About 92% of violence victims treated in ED's were released at once after treatment; about 7% were hospitalized for further treatment.

Seventeen percent of those requiring ED treatment for violence-related injuries, about 243,000 persons, had been injured by someone with whom they had an intimate relationship — a husband, ex-husband, boyfriend, girlfriend, ex-boyfriend, or ex-girlfriend.

These are some key findings of the Study of Injured Victims of Violence (SIVV), conducted for the Bureau of Justice Statistics (BJS) by the Consumer Product Safety Commission (CPSC), to estimate the number of persons treated in hospital emergency departments for nonfatal injuries from violence.²

Study of Injured Victims of Violence

The SIVV was undertaken to augment available estimates of certain types of more serious violence, such as domestic violence and sexual assault,

²This study was initiated with funding from the Administration for Children and Families, U.S. Department of Health and Human Services.

Table 1. Characteristics of persons treated in hospital emergency departments for violence-related injuries, 1994

Characteristic of emergency department patients injured by violence	Number treated	Percent	Rate per 1,000 U.S. residents
Total	1,417,600	100%	5.5
Sex			
Male	862,000	60.8%	6.8
Female	554,700	39.1	4.2
Not specified	900	.1	--
Race			
White	744,400	52.5%	3.4
Black	344,300	24.3	10.5
Other	161,600	11.4	14.4
Not recorded	167,200	11.8	--
Age			
Under 12	75,600	5.3%	1.6
12-14	87,100	6.1	7.8
15-18	199,600	14.1	14.2
19-24	325,800	23.0	14.9
25-34	389,600	27.5	9.4
35-64	318,700	22.5	3.5
65+	20,300	1.4	0.6
Not recorded	900	.1	--

--Not applicable.

that have been shown to be difficult to measure. (See the box on page 6 and *Understanding Violence Against Women*, National Research Council, 1996)

The study was conducted as a supplement to the National Electronic Injury Surveillance System (NEISS), in a nationally representative, one-third sample of 31 hospitals having emergency departments. CPSC conducts the NEISS to measure injuries related to consumer products. Because hospital coders examine every ED record, NEISS can be used for special studies outside the normal scope of the CPSC mission. (See the box on this page.)

Relying on ED records, coders in each sample hospital classified the cause of injury for every person treated as intentional, possibly intentional, or unintentional.

Intentional injuries were those deemed to have been caused deliberately by another person. These injuries, for example, resulted from assaults, fights,

family violence or abuse, and sexual assault or rape.

Possibly intentional injuries were those in which the injury sustained was characteristic of injury from violence, such as extensive bruising with no explained cause, or those in which the cause reported did not account for or was inconsistent with the injury sustained. In the same category were those injuries about which a knowledgeable person, such as a parent or guardian of the ED patient, expressed suspicions of violence. This category included suspected family violence and sexual assault.

Unintentional injuries were injuries resulting from accidents such as motor vehicle accidents, falls, occupational injuries, and sports injuries.

In this report *violence-related injuries* refers to nonfatal injuries classified as either intentional or possibly intentional. The study excludes self-inflicted injury and uses *violence* and *interpersonal violence* interchangeably.

The National Electronic Injury Surveillance System of the CPSC

The NEISS is an ongoing program to identify and measure the number and type of injuries associated with consumer products. The injuries are those treated at hospital ED's in the United States and its territories.

The NEISS is conducted at a sample of 91 hospitals. The stratified, probability sample of hospitals was constructed to be representative of all U.S. hospitals that have at least 6 beds and provide 24-hour emergency service. The collected data can be weighted to produce national estimates of patients treated in hospital ED's. (See page 8 for further discussion of the NEISS methodology.)

The medical staffs at the selected hospitals have been trained to include information in patient records about the cause and circumstances of any treated injury. Coders at each

hospital examine the records of all ED patients and identify cases involving injuries related to consumer products. For pertinent cases the coders abstract information on a number of variables. The coders enter the information into personal computers and electronically transmit the data to CPSC for processing and tabulation.

Because the sample is nationally representative and the record of every patient at selected ED's is evaluated, the NEISS provides an efficient means for collecting information about injuries resulting from violence.

In addition to SIVV, the NEISS sample has been used for studying the following: firearm injuries (Centers for Disease Control), injuries involving motor vehicles (National Highway Traffic Safety Administration), and work-related injuries (National Institutes for Occupational Safety and Health).

For each intentional or possibly intentional injury identified, hospital coders extracted from the ED records information about the patient and the nature of the violence related to the injury. As explained in the *Methodology* section on page 8, unintentional injuries were excluded from the study; as were fatal injuries, self-inflicted injuries, those that law enforcement officers inflicted in the line of duty, injuries such as broken hands incurred by persons while attacking others or committing other crimes, and those inflicted by persons under age 13.

Intentional injuries treated

About 1.4 million people were treated in hospital ED's in 1994 for nonfatal injuries sustained in intentional or possibly intentional acts of violence (table 1). Injuries were categorized based on the circumstances of their occurrence rather than offenders' motives.

While an offender may not have intended to cause the specific injuries measured by the study, the injuries were the outcomes of violent acts. Thus, a nose broken in a fight, a gunshot wound of an innocent passerby to a drive-by shooting, and a stab wound inflicted during a robbery are examples of intentional or possibly intentional injuries that the study measured.

	Number	Percent
Total	1,417,500	100.0%
Intentional	1,335,900	94.2
Possibly intentional	81,700	5.8

In 1994 persons treated for intentional or possibly intentional injuries accounted for 3.6% of all physical injuries treated in hospital ED's. The 1994 SIVV estimate of 1.4 million treated in hospital ED's for injuries from interpersonal violence was virtually identical to the estimate of violence-related injury by the 1994 National Hospital Ambulatory Medical Care Survey (NHAMCS).³ Excluding homicides would not measurably affect the NHAMCS estimate of 1,456,000 ED visits related to "homicide and injury purposely inflicted by

other persons." Most of the 23,300 homicide victims in 1994 were not brought to ED's.

Characteristics of persons treated for violence-related injuries

Three-fifths of all persons treated in hospital ED's during 1994 for injuries sustained in violence were male. About half were under age 25. Blacks, who constitute about 13% of the Nation's population, were 24% of those treated for violence-related injuries.

These data on the characteristics of persons in hospital ED's for violence-related injuries corroborate data from other sources on the characteristics of victims of violent crime. The National Crime Victimization Survey (NCVS) has consistently found that blacks, males, and persons age 15-24 are the most vulnerable to become violent crime victims.⁴ Comparisons between SIVV data and those from the NCVS are discussed on page 7.

Characteristics of injuries

While a patient might have exhibited a variety of injuries, using information in ED records, CPSC's coders at each hospital in the study categorized the most serious or significant of the injuries sustained.

About a third of all persons in the study were treated for bruises or similar injuries, and another third were treated for cuts, stab wounds, or internal injuries (table 2). About a sixth of the injuries treated were muscular/skeletal injuries, such as fractures, sprains, dislocations, or dental injuries. Gunshot injuries and rapes or other sexual assaults each represented about 5% of all treated injuries.

Among those injuries for which the place of occurrence was obtained, almost half were inflicted in or around a home, either the patient's or someone else's. Public places, such as stores, restaurants, or office buildings, were the next most common (29%), fol-

lowed by open areas such as on the street (15%).

About three-fifths of the injuries were inflicted without the use of a weapon. Most such patients were injured after being punched or kicked. Some were injured in falls during assaults or by being thrown to the ground, into part of a building like a wall or door, or into an object like a table.

Table 2. Characteristics of violence-related injuries treated at hospital emergency departments, 1994

Characteristic of injury and violent event	Number	Percent
Injury diagnosis		
Total	1,417,500	100.0%
Shot	70,300	5.0
Concussion/head injury	50,900	3.6
Muscular/skeletal injury	234,800	16.6
Cut/stab wound/internal injury	433,500	30.6
Bruise	477,600	33.7
Burns/chemical injury	13,300	.9
Poisoned	1,400	.1
Rape/sexual assault	63,800	4.5
Other	72,000	5.1
Weapon used		
Total	1,417,500	100.0%
No weapon	827,700	58.4
Firearm	60,900	4.3
Hit with gun	15,300	1.1
Knife/sharp object	100,100	7.0
Other object	264,900	18.7
BB/pellet gun	9,400	.7
Not recorded	139,200	9.8
Place of occurrence		
Total	1,417,500	100.0%
Home	410,300	28.9
Street	128,300	9.0
Store, office, factory	246,400	17.3
School	54,800	3.9
Recreational area	20,300	1.4
Not recorded	557,300	39.4
Month of occurrence		
Total	1,417,500	100.0%
January	101,300	7.1
February	90,700	6.4
March	102,400	7.2
April	115,600	8.2
May	114,300	8.1
June	135,200	9.5
July	136,100	9.6
August	139,800	9.9
September	129,600	9.1
October	124,100	8.8
November	115,700	8.2
December	112,700	8.0

³Centers for Disease Control, *Hospital Ambulatory Medical Care Survey: 1994 Emergency Department Summary Advance Data*, 275, May 17, 1996.

⁴BJS, *Criminal Victimization in the United States, 1994*, NCJ-162126, May 1997.

Table 3. Involvement of alcohol or illegal drugs in violence-related injuries treated in hospital emergency departments, 1994

Involvement of alcohol or illegal drugs	Patients with violence-related injuries					
	All		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Total	1,416,600	100.0%	862,000	100.0%	554,700	100.0%
Involvement	201,400	14.2	144,800	16.8	56,600	10.2
No involvement recorded	1,215,300	85.8	717,200	83.2	498,000	89.8

Note: Table excludes cases for which sex of patient was not ascertained.

About 5% of the victims, representing about 61,000 injured, were treated for nonfatal gunshot wounds. These injuries exclude those inflicted by BB or pellet guns, shown separately. The firearm injury estimate was not significantly different from that of a previous study conducted by the Centers for Disease Control using a full sample of 91 NEISS hospitals. That study estimated 58,485 persons were treated in hospital ED's for firearm injuries from assault or legal intervention during the year ending May 31, 1993.⁵

About 100,000 people, or about 7% of all those treated for violence related injuries, were treated for stabbing or cutting wounds. Approximately 19%

⁵Joseph L. Annett, James A. Mercy, Delinda R. Gibson, and George W. Ryan, "National Estimates of Nonfatal Firearm-Related Injuries," *Journal of the American Medical Association*, 273, 22, June 14, 1995, pp. 1749-1754.

Table 4. Disposition of emergency department patients treated for violence-related injuries, by type of weapon, 1994

Weapon identified with injuries treated	Total	Treated and released	Hospitalized
Total	100%	92.4%	7.6%
No weapon	100	97.0	3.0
Gun	100	39.6	60.4
Hit with gun	100	93.9	6.1
Knife/sharp object	100	76.0	24.0
Other object	100	94.9	5.1
BB/pellet gun	100	92.3	7.7
Not recorded	100	95.1	4.9
Total	100.0%	100.0%	
No weapon	61.3	23.1	
Gun	1.8	34.2	
Hit with gun	1.1	.9	
Knife/sharp object	5.8	22.3	
Other object	19.2	12.6	
BB/pellet gun	.7	.7	
Not recorded	10.1	6.3	

of the injuries were sustained by being hit with an object like a rock or a stick that an assailant held or threw. In nearly 10% of the cases, the source of the injury was not recorded.

A slightly higher percentage of violence-related injuries occurred during the warmer months — June, July, and August — than during other months. Altogether 29% of the intentional and possibly intentional injuries occurred during the summer.

In 14% of the violence-related injuries treated in ED's in 1994, the ED record indicated that the victim or someone else involved in the incident had been drinking or using drugs (table 3). This estimate should be considered a lower bound of the percentage of injuries involving alcohol or drugs. Usually the ED's did not test patients for intoxication but indicated alcohol or drug involvement if cited by patients or other involved persons or if ER personnel observed the patient under the influence of alcohol or drugs.

In most cases the hospital record did not specify whether the person who had been drinking was the patient,

Table 5. Characteristics of persons causing violence-related injuries treated in hospital emergency departments, 1994

Characteristic of the offender	Number	Percent
Sex		
Total	1,417,500	100.0%
Male	763,400	53.9
Female	144,300	10.2
Not reported	509,800	36.0
Age		
Teenager (12-19)	185,500	13.1%
Adult (20+)	726,700	51.3
Teen or adult	43,500	3.1
Not reported	461,900	32.6

another person involved in the incident surrounding the injury, or both. Almost all of the alcohol/drug citations on the hospital records reflected alcohol involvement. Drugs were cited on the hospital record in less than 1% of all violence-related injuries treated.

The apparent difference between the percentages of injuries associated with alcohol and/or drugs for men (17%) and women (10%) was not statistically significant. About a fifth of the alcohol/drug-related injuries to men were sustained in or near bars or restaurants, many during what were characterized on the hospital records as "bar fights."

	Male	Female
Total involving alcohol	100%	100%
At/near bar	18	9
Other/unspecified place	82	91

Over 90% of all persons requiring ED treatment for intentional or possibly intentional injuries were released after treatment (table 4). About 8% were hospitalized at least overnight.

Persons suffering gunshot or knife wounds were more likely than other persons treated to require overnight hospitalization. Sixty percent of persons treated in the ED for gunshot wounds required overnight hospitalization, as did 24% of those suffering stab wounds. While accounting for only 5% of those treated, victims of gunshot wounds represented a third of those requiring hospitalization. (Firearms were involved in about 70% of U.S. murders in 1994. These fatal injuries were outside the scope of this study.) Similarly, stabbing victims, about 7% of persons treated, represented a fourth of those who were hospitalized after treatment in the ED.

Characteristics of persons inflicting injuries

Although about a third of the cases contained no information about the person who inflicted the injury, in those cases with such information, 5 in every 6 ED patients reported that a male had injured them (table 5). Three of every four patients providing information on offender age reported that the person

Table 6. Relationship between the emergency department patient injured by violence and the person committing that violence, 1994

Relationship to patient	Number	Percent
Total	1,417,500	100.0%
Spouse/ex-spouse	103,800	7.3
Parent	40,400	2.8
Child	11,500	.8
Other relative	57,700	4.1
Boy/girlfriend	139,600	9.8
Other friend	228,200	16.1
Other acquaintance	102,400	7.2
Stranger	326,400	23.0
Not reported	407,600	28.8

who injured them was over age 19. To facilitate obtaining information about the person who inflicted the injury, hospitals classified age into three categories: child (under age 13), teenager (age 13-19), and adult (age 20 or older). As explained on page 9, persons injured by children were excluded from the analysis for this report.

These data substantiate findings from the NCVS that adult males commit most violence. Males committed more than three-fourths of the violent crimes that the NCVS measured in 1994. Persons age 18 or older committed about four-fifths of NCVS-measured aggravated assaults. In about a third of all cases in the SIVV, however, the ED record did not contain information about the characteristics of the person inflicting the injury.

Table 7. Patient/offender relationship in violence-related injuries, by the sex of emergency department patient, 1994

	Hospital ED patients injured by violence			
	Male		Female	
	Number	Percent	Number	Percent
Total	862,000	100.0%	554,700	100.0%
Spouse/exspouse	15,400	1.8	88,400	15.9
Other relative	56,900	6.6	52,600	9.5
Boy/girlfriend	23,600	2.7	116,000	20.9
Other friend	142,100	16.5	86,100	15.5
Other acquaintance	75,200	8.7	27,200	4.9
Stranger	248,800	28.9	77,500	14.0
Not reported	300,100	34.8	106,900	19.3

Child injuries from suspected rape and sexual assault

Virtually all of the older teenagers and adults who visited the hospital ED's as a result of sexual violence sought treatment for a physical injury suffered during the attack. A substantial number of the child patients, representing 39% of the rape and sexual abuse cases of children under age 12 treated at the ED's in 1994, were brought by parents or guardians to evaluate whether the child had been a victim of a sexual assault or rape. In many cases of suspected abuse, there were physical signs or symptoms that could have resulted from sexual abuse. In other cases the children had been alone with persons suspected of committing such acts.

In almost all of these suspected child abuse cases, the study records do not include outcomes of the hospital examinations or of other investigations.

Adult men inflicted two-thirds of the violence-related injuries about which ED patients provided information. Teenage males were responsible for an additional 15%; adult women, 11%, and teenage females, 4%.

Offender age	Offenders identified by ED patients	
	Male	Female
Teenager (12-19)	14.7%	3.8%
Adult (20+)	66.9	10.8
Teen or adult	2.9	.8

For this study these cases were classified as possibly intentional injuries, and the data reflect suspected, rather than confirmed sexual abuse of children.

Recent studies of the validation of claims of sexual abuse of children have found that physical examinations alone are usually insufficient to determine whether a child has been the victim of such attacks.^{*} The American Academy of Pediatrics "Guidelines for the Evaluation of Sexual Abuse of Children" states that the diagnosis of child sexual abuse must be made on the basis of a child's history, of which the physical examination is one part.[‡]

^{*} Joyce A. Adams, "Significance of Medical Findings in Suspected Sexual Abuse: Moving Towards Consensus," *Journal of Child Sexual Abuse*, 1, 3, 1992, pp. 91-99.

[‡] American Academy of Pediatrics, "Committee on Child Abuse and Neglect, Guidelines for the Evaluation of Sexual Abuse of Children," *Pediatrics*, 87, 2, February 1991, pp. 254-260.

Patient-offender relationship

The patient's spouse or ex-spouse inflicted about 7% of all violence-related injuries treated in ED's (table 6). A current or former boyfriend or girlfriend caused injuries to an additional 10% of persons seeking treatment. Parents, children, siblings, and others related to the patient were responsible for about 8% of all intentional or possibly intentional injuries; friends or acquaintances caused about 23%; and persons who were strangers to the patients, about 23% of the injuries. In almost 30% of all cases, the relationship between the patient and the injurer was unknown.

A higher percentage of women than men were injured by someone with whom they shared an intimate relationship: a spouse, ex-spouse, boyfriend, girlfriend, ex-boyfriend, or ex-girlfriend (table 7). Conversely, injured men were more likely than women to have been treated for injuries inflicted by nonrelatives: acquaintances and strangers. Because the patient-offender relationship was unknown

in about a third of all injuries of males, compared to a fifth of injuries of females, this finding should be regarded by some caution.

When cases without a recorded patient-offender relationship areas are excluded, patients under age 12 were more likely to have been injured by a relative or acquaintance than by a stranger. Over half of the teenagers requiring ED treatment for violence-related injuries were injured by an acquaintance. Adults were about equally likely to be injured by an acquaintance or a stranger —

Age of ED patient	Total	Relationship to the patient of the person who inflicted the injury		
		Relative	Acquaintance	Stranger
Child (younger than 12)	100%	56.3%	34.1%	9.7%
Teenager (age 12-19)	100%	11.9	58.2	29.9
Adult (age 20 or older)	100%	20.9	43.9	35.2

Crime classification of incidents surrounding injuries

To measure the number of incidents in which ED patient injuries were sustained from criminal actions and to enable comparisons with estimates from the National Crime Victimization Survey (NCVS), each SIVV case was assigned a type-of-crime code. BJS

applied the code by reviewing the written descriptions of the incidents on the NEISS record. The coding protocol is described in *Type-of-crime coding of injuries in the SIVV* on page 9.

In many cases the written descriptions, which were based on information that the patient or another knowledgeable person provided, contained minimal

Accounting for differences in measures of violent crime

The Federal Government and research organizations currently conduct several programs to measure the prevalence, characteristics, and consequences of violent crime. The Department of Justice administers two such ongoing programs. The FBI's Uniform Crime Reporting (UCR) program provides a measure of the number of crimes that come to the attention of law enforcement agencies across the Nation, and the BJS National Crime Victimization Survey (NCVS) provides a detailed picture of crime incidents, victims, and trends from the victim's perspective.

The estimates from the various studies of violent crime have often varied dramatically. Such differences are expected, given the differences in the nature and content of differing statistical programs. Discussing differences in estimates of violence against women from various studies, the National Academy of Sciences found that "as with all research, a variety of methodological factors can be linked to the differences in study findings. Sample composition and locale, data collection method and question construction and context are among the

most important methodological differences in U.S. studies."^{*}

It is therefore not surprising that the SIVV estimates of the persons treated in hospital ED's for violence-related injuries differ from those of the NCVS, even when, to enhance comparisons with the NCVS, injuries sustained by persons under age 12 were excluded from the SIVV. The differing methodologies and contexts of the two studies can explain much of the differences between the SIVV and NCVS estimates.

The SIVV is based on identification by a patient, hospital staffer, or other knowledgeable person of the cause of injuries sustained by people treated in the ED. The context of the study is nonaccidental injury, regardless of whether the victim perceived the event to have been criminal in nature.

The context of the NCVS is crime, some of which resulted in injury requiring treatment in a hospital ED. Any injuries sustained in violence that a victim did not perceive to be criminal in nature might not be recounted by the victimization survey.

There are also other information filters operating in each program that

^{*}National Research Council (NRC) *Understanding Violence Against Women*, Washington D.C., 1996.

can help to explain differences in resulting estimates. The SIVV data are collected at the time the injury is treated; therefore, error cannot be introduced by forgetting or misremembering aspects of the incident. However, some people treated in hospital ED's may choose not to relate the cause of injury or may provide inaccurate or incomplete information about the source of injury. The NCVS data are collected up to 6 months after the incident. Responding to personal situations at the time of the interview, victims may choose not to recount incidents or may feel unable to recount incidents that happened to them earlier.

Moreover, the SIVV includes persons who live outside usual household settings, such as the homeless and persons in institutions, not included in the NCVS.

The appropriateness of a particular measure must depend on the context in which the estimate is used. As an example, the NCVS estimate of persons treated in ED's could be more appropriate in discussions of the extent to which crime victims seek treatment for their injuries, while the SIVV measure could be more appropriate for examination of the more encompassing impact of violence on health services.

Table 8. Offense type in violence-related injuries treated in hospital emergency departments, 1994

	Number	Percent
Total	1,417,500	100.0%
Rape/sexual assault	65,100	4.6
Robbery	22,000	1.5
Assault	1,330,400	93.8
Fight/altercation	416,600	29.4
Assault	913,800	64.5

detail of circumstances of the injury. These cases were, for lack of other information, categorized for the study as assaults, as were cases in which the assaultive behavior was fully described. About 94% of the injuries in the SIVV were sustained during incidents that were classified for the study as assaults (table 8). Of these a third were sustained in what were described as altercations or fights. About 2% of the people treated for intentional injuries were victims of robbery, and 5% were victims of rape, sexual assault, or suspected sexual assault.

While the percentages of treated injuries from assaults were generally similar among age groups, young children differed from others in the percentages of treated injuries that resulted from fights and sexual assaults. Among patients treated for a violence-related injury, about 29% of the children under age 12 were treated for suspected or confirmed rape or sexual assault, compared to 5% of teens and 3% of adults (table 9). See the box *Child injuries from suspected rape and sexual assault* on page 5.

Children treated in ED's for intentional or possibly intentional injuries were less likely than teenagers or adults to have sustained their injuries in incidents characterized as fights or altercations (9% versus 33% and 30%, respectively.) Part of these differences between children and others injured in fights may have come from NEISS excluding injuries inflicted by persons age 12 or younger.

Table 9. Offense type in violence-related injuries treated in hospital emergency departments, by age of patient, 1994

	Total	Child (under age 12)	Teen (age 12-19)	Adult (age 20 or older)
Number				
Total	1,416,700	75,600	341,000	1,000,000
Rape/sexual assault	65,100	22,100	15,500	27,500
Robbery	22,000	100	2,300	19,600
Assault	1,329,600	53,500	323,200	952,900
Fight/altercation	416,500	7,100	113,200	296,200
Assault	913,100	46,400	210,000	656,700
Percent				
Total	100.0%	100.0%	100.0%	100.0%
Rape/sexual assault	4.6	29.2	4.5	2.8
Robbery	1.6	.1	.7	2.0
Assault	93.9	70.7	94.8	95.3
Fight/altercation	29.4	9.4	33.2	29.6
Assault	64.5	61.3	61.6	65.7

Note: The table excludes cases for which the age of the patient was not ascertained.

Among children under age 12 brought to hospital ED's, half of those who were examined or treated for sexual abuse were age 4 or younger; half those treated for injuries from other types of violence were age 5 or younger.

	Median age of children under age 12 treated in hospital ED's for violence-related injury
Any injury	5 years
Rape/sexual assault*	4
Fights, assault	6

*Includes suspected rape/sexual assault.

Comparisons with other data on violence

The SIVV was implemented to improve estimates of certain types of more serious violence, especially those difficult to measure — violence between people known or related to

each other, rape and sexual assaults, and violence against children.⁶ These crimes typically occur in nonpublic settings. Many of the victims, including those of long-term abuse, are unable or unwilling, because of fear or embarrassment, to report such abuse to authorities or to programs that measure these victimizations.

The NEISS collection effort may help clarify the variations in current estimates of such crimes. The estimates often vary because of differences in collection methods and because there is lack of agreement on the behaviors defined by "domestic violence," "sexual assault," and "child abuse."

⁶National Research Council (NRC), *Understanding Violence Against Women*, Washington D.C., 1996.

In 1992 BJS redesigned the NCVS questionnaire to “produce more accurate estimates of rape and sexual assault and of any kind of crimes committed by intimates or family members.”⁷ At the time it was redesigning the victimization survey, BJS began exploring alternative means for measuring the extent and characteristics of these difficult-to-measure forms of violence. The fielding of the SIVV in 1993 came from this effort.

SIVV estimates of persons seeking treatment at hospital emergency departments in 1994 for violence-related injuries are substantially higher than NCVS estimates for the same category of persons (1.3 million versus 540,000) (table 10). For these comparisons, SIVV patients under 12 years old were excluded to allow comparability with the NCVS.

The differences between the SIVV and the NCVS estimates were greatest for those types of violence thought to be most undercounted in studies of violence, that is, rapes/sexual assaults and crimes by intimates or other relatives. The number of rapes/sexual assaults measured by the SIVV was about double that of the NCVS. The SIVV estimate of ED treated injuries inflicted by a spouse or ex-spouse was many times that of estimates from the NCVS. The differences between the SIVV and NCVS were not evenly distributed across types of crimes or patient-offender relationships.

The percentages of ED treated injuries inflicted by intimates, and by relatives, were substantially higher in the SIVV than in the NCVS, despite a larger number of SIVV cases with missing data for victim-offender relationship. An intimate — a current or former spouse, boyfriend, or girlfriend — inflicted 18% of all injuries recorded in the SIVV, compared to 12% of injuries treated in ED's and recorded in the NCVS. The NCVS estimate of the proportion of injuries inflicted by a

stranger was about double that of the SIVV (54% versus 24%).

The two programs also differed in the nature of the offenses surrounding the injuries. While the percentage of all injuries treated in ED's that were rapes or sexual assaults were almost identical in the two programs, the percentage of injuries sustained in robberies was almost negligible in the SIVV but represented about 20% of the ED-treated injuries in the NCVS. When the patients were treated at the hospital, some SIVV robbery cases were likely classified as assaults. It is not possible to determine from these data the extent of such misclassification, however.

A principal reason for differences between estimates from this study and the NCVS are the differences in study contexts and victim perspectives. Some of these methodological differences in the two programs are discussed in the box on page 6.

SIVV data provide evidence that the crimes believed to be most liable to undercounting are actually more frequent than the NCVS has estimated. The fresh perspective of the hospital ED enables a formulation of a broader measure.

Methodology

Data collection for the SIVV began in October 1993 at a one-third sample (31 ED's) of the current NEISS sample. The data described in this report cover injuries treated in hospitals in the NEISS sample during calendar year 1994.

Sample design

The 91 hospitals in the NEISS sample were selected from 4 strata based upon hospital size (small, medium, large, and very large) as determined by the number of annual visits to the ED's. The NEISS sample includes hospitals in urban, suburban, and rural settings, and was designed to enable national estimates. Because the sample is representative of all hospitals with ED's in the Nation, the NEISS can be used to estimate the number and characteristics of all injuries, including injuries derived in acts of violence, treated in hospital ED's.

For the SIVV, a third of the hospitals in each strata, for a total of 31, were randomly selected for inclusion in the study. To obtain national estimates of intentional and possibly intentional injuries, each injury was assigned a weight based on the inverse of the

Table 10. Comparison of the Study of Injured Victims of Violence (SIVV) and the National Crime Victimization Survey (NCVS), by offense, 1994

Type of offense	SIVV patients*		NCVS victims reporting treatment at a hospital emergency department		Ratio of SIVV/NCVS
	Number	Percent	Number	Percent	
Total	1,341,900	100.0%	539,300	100.0%	2.5
Rape/sexual assault	43,000	3.2	24,300	4.5	1.8
Robbery	21,900	1.6	109,900	20.4	0.2
Assault	1,277,000	95.2	405,000	75.1	3.2
Total	1,341,900	100.0%	539,300	100.0%	2.5
Spouse/ex-spouse	103,800	7.8	25,100	4.7	4.1
Other relative	75,200	5.5	8,200	1.5	9.2
Boy/girlfriend (current or former)	139,600	10.5	37,700	7.0	3.7
Other acquaintance	313,400	23.2	143,900	26.7	2.2
Stranger	322,000	24.1	289,800	53.7	1.1
Unknown or unreported	388,000	29.0	34,500	6.4	11.2

*Age 12 or older.

⁷BJS, *Violence against Women: Estimates from the Redesigned Survey*, BJS Special Report, August 1995, NCJ-154348.

Table 11. Patients treated in hospital emergency departments, by type of injury, 1994

	Un-weighted number	Percent
Total	13,161	100.0%
Intentional/possibly intentional	11,549	87.8
Recoded as unintentional	24	.2
Dead on arrival	55	.4
Injured by law enforcement	227	1.7
Injured by child under age 12	1,167	8.9
Offender injured	98	.7
Self-inflicted	31	.2

probability of selection of the hospitals within each of the four strata of hospital size. Adjustments to the weights were made when necessary to account for changes in the NEISS sample and non response by hospitals in any given month. Because the SIVV sample was a third the size of the NEISS sample, the SIVV weights were 3 times the NEISS weights. To produce national estimates, study weights were summed across all hospitals for cases of interest.

Study procedures

Prior to the start of the Study of Injured Victims of Violence in 1993, medical staffs and NEISS coders at each in-sample hospital were trained to identify injuries sustained during acts of violence. At each hospital in the sample, on an ongoing basis, NEISS coders examined the ED records to determine the nature and source of every injury for which people sought treatment.

Based on information provided by ED doctors and nurses the coders classified all injuries into one of three categories:

- intentional injury
- possible or suggestive of intentional injury
- nonintentional injury.

For all cases classified as intentional or possibly intentional, the coders recorded additional information about the case, including information about the person inflicting the injury and type of weapon used, (if any), to inflict the injury.

Only those injuries coded as intentional or possibly intentional were included in the study. Nonintentional injuries were those determined to be accidental in nature. In addition, self-inflicted injuries, such as suicide attempts, were excluded as out of scope for the study.

In all, 13,161 unweighted cases were coded by sample hospitals as intentional or possibly intentional injuries treated in 1994. Upon review in BJS, some cases were reclassified based on the written and coded entries of the cases. Twenty-four cases were reclassified as non-intentional injuries; in most of these, the written entries indicated injuries consistent with accidents. Three of the recoded cases were statutory rapes, outside the scope of this study. (Statutory rape was excluded to maintain comparability with NCVS and UCR measures of violent crime. These programs exclude statutory rape from their violent crime estimates.)

A number of persons injured by violence were excluded from the analyses for this report:

- Persons who died en route to or in ED's
- Persons injured by children age 13 or under
- Criminal suspects and prison or jail inmates injured by law enforcement officials

- Persons hurting themselves in suicide attempts or other circumstances
- Persons injured while committing a crime or assaulting others in a fight.

Some of these exclusions were made because there was not enough information to classify them correctly. Most were made to focus on the issue of crime more closely; children younger than 13, for example, would seldom be charged with a crime. In all, the cases excluded from analysis represented about 12% of all intentional or possibly intentional injuries treated at the hospitals (table 11). Three-fourths of the excluded cases were injuries inflicted by children age 12 or younger.

The NEISS sample does have some limitations that should be taken into account then interpreting the results from this study. The Centers for Disease Control, as part of their NEISS-based study of firearm injuries, identified four major factors associated with the NEISS sample design that could influence the accuracy of national estimates of gunshot wounds.⁸

⁸For a comprehensive discussion of these factors see Yvette Davis, Joseph L. Annett, Kenneth E. Powell, and James A. Mercy, "An Evaluation of the National Electronic Injury Surveillance System for Use in Monitoring Nonfatal Firearm Injuries and Obtaining National Estimates," *Journal of Safety Research*, 27, 2, 1996, pp. 83-91.

Appendix table. Estimates of intentional and possibly intentional injuries treated at hospital emergency departments, by various characteristics: standard errors, confidence intervals, and coefficients of variation, 1994

	Number	Standard error (SE)	95-percent confidence interval		Coefficient of variation (CV)
Total	1,417,535	131,248	1,160,289	1,674,781	0.093
Intentional	1,335,864	126,417	1,088,086	1,583,642	0.095
Possibly intentional	81,671	19,299	43,845	119,496	0.236
Male	861,993	86,829	691,809	1,032,177	0.101
Female	554,653	49,894	456,860	652,446	0.090
White	744,377	68,968	609,199	879,555	0.093
Black	344,332	67,286	212,450	476,213	0.195
Other	161,645	61,247	41,601	281,688	0.379

These factors, which may apply to violence-related injuries as well, are the following:

— The NEISS sample does not account for hospitals with an ED that came into existence after 1985.

— Hospitals were assigned to different strata based on the number of annual visits for treatment. The current NEISS sample design does not account for annual changes in the number of ED visits when assigning hospitals to different strata.

— Most of the large and very large hospital in the NEISS sample are located in the northeastern United States. While the overall sample is statistically valid, the uneven distribution of the larger hospitals may influence national estimates based on NEISS data.

— For gunshot wounds there was substantial variation in the number of cases within and among hospital size strata. This variation yielded coefficients of variation of about 22%, which are high compared to the coefficients of variation for annual estimates of product-related injuries (10%).

Despite these limitations, CDC concluded that the NEISS was a useful tool for conducting research into firearm injury.

Type-of-crime coding of injuries in the SIVV

A hierarchy based on that used for the NCVS was used to code type of crime: rape, attempted rape, sexual assault, robbery, assault. Thus, a case was classified as a rape or attempted rape if the written description mentioned “rape” or “attempted rape” or described such acts. Absent these, if the description described other sexual assaults, it was so classified. This category included children brought to the emergency department for evaluation of possible sexual abuse. (See the box on page 5.)

Cases not involving rape or sexual assault that included aspects of theft or which were described as “mugging”

were coded as *robberies*. Cases not classified above that were described on the records as “fights,” “arguments,” and “altercations” were classified as *fights* and cases not coded as described above were classified as *assaults*. Typically, these last described cases had summaries that included such descriptions as “beaten,” “struck,” “shot,” “hit,” “hit with,” “assaulted,” “punched,” and “kicked.” For comparison with the NCVS, fights and assaults in the SIVV were combined into a composite assault category.

For a number of reasons, the limited amount of available information constrained the type-of-crime coding for this study. For each SIVV case, the code was based primarily on a summary within two lines of writing describing the reason for the ED visit and on the description of the injury gleaned from the medical record.

Three conditions especially restricted the coding. First, the coding depended on information provided by the patient or someone with the patient, and does not represent a legal finding about the case. It is possible that some robbery, rape, and sexual assault injuries were classified as assaults because the injured person during treatment did not provide the information. Second, some patients were unwilling or unable to provide information about the incident in which the injuries were received. Third, medical staffs varied widely in the amount of information about causes of injury that they elicited and recorded on hospital forms.

A good example of the limits imposed on the coding occurred in trying to separate injured offenders from injured victims. Except for those cases in which the hospital record contained information that the person treated had been injured while committing a crime, the study could not distinguish between the two types of patients. Cases in which the record clearly indicated that the patient suffered injury in the course of committing a crime were removed from analysis.

However, since many injuries in the study resulted from events recorded as altercations, fights, and arguments, the records did not contain enough information to differentiate those injuries suffered by “innocent” victims from injuries inflicted upon aggressors or instigators of violence. It is likely that investigation of many of these cases, like those of persons injured in bar fights, would not have been able to establish who were offenders and who were victims.

The extent of information entered in this text area varied considerably from case to case. For the sake of consistency, it was decided not to attempt to interpret the information available, but to rely upon what was entered in the text.

Standard errors of estimates

Variance estimates were calculated for each estimate presented in this report using formulas provided by the CPSC. These variance estimates were used to calculate standard errors (SE’s) and coefficients of variation (CV’s) for each estimate.

The national estimate of 1.4 million intentional and possibly intentional injuries had an SE of 132,000 and a CV of 9.3%.

All comparisons presented in this report met statistical tests of significance at the 90-percent or 95-percent confidence levels. Most differences presented were significant at the 95-percent confidence level (about 2.0 standard errors). Differences significant at the 90-percent confidence level (about 1.6 SE’s) were qualified by the phrase “some evidence.”

The SE’s, 95-percent confidence levels, and CV’s for some of the major variables are presented in the appendix table on page 9.

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The Bureau of Justice Statistics is the statistical agency of the U.S. Department of Justice. Jan M. Chaiken, Ph.D., is director.

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This report and many of its data, as well as other reports and statistics, may be found at the Bureau of Justice Statistics Internet World Wide Web site:
<http://www.ojp.usdoj.gov/bjs/>

Data presented in this report may be obtained from the National Archive of Criminal Justice Data at the University of Michigan, 1-800-999-0960. The archive may also be accessed through the BJS Web site.