



COUNTY OF LOS ANGELES • DEPARTMENT OF HEALTH SERVICES  
**Injury and Violence Prevention Program**

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**Weapon-Related Injury Surveillance System Report  
1998-2000**

**Executive Summary**

- Injuries from firearms and knives are a major cause of morbidity and mortality in Los Angeles County.
- The Injury and Violence Prevention Program is conducting surveillance for firearm and knife injuries at four DHS hospital emergency departments (Harbor-UCLA Medical Center [HUMC], LAC+USC Medical Center [LAC+USC], M.L. King, Jr/Drew Medical Center [MLK], Olive View Medical Center [OVMC]) and Rancho Los Amigos Medical Center.
- In 2000, there were 2,212 visits for firearm injuries reported by the five surveillance sites. The medical charges for these injuries were more than 24 million dollars.
- Firearm injuries decreased 10% from 1998 to 1999, and increased 6% from 1999 to 2000 resulting in an overall decrease of 5% from 2,321 in 1998 to 2,212 in 2000.
- In 2000, visits for firearm injuries were primarily among Latinos (50%), males (91%), and persons aged 15-34 years (81%).
- In 2000, there were 1,886 visits for stab injuries reported by the five surveillance sites. The medical charges for these injuries were more than 11 million dollars.
- Stab injuries decreased 19% from 2,321 in 1998 to 1,886 in 2000.
- In 2000, visits for stab injuries were primarily among Latinos (55%), males (76%), and persons aged 25-44 years (46%).
- The ratio of visits for firearm to knife injuries was 1.2:1, while the ratio of charges for firearm to knife injuries was 2.1:1.
- The surveillance data are used by Public Health, law enforcement, and social service agencies to monitor trends in violence and injuries related to firearms and stabbings, evaluate the effectiveness of violence and injury prevention programs, and identify gaps in coverage in prevention programs for both intentional and unintentional injuries.



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Injuries from firearms and stabbings are a major cause of morbidity and mortality in Los Angeles County. In 1998, one-third of the 3,731 injury deaths in the county were caused by firearms (1,207) and stabbings (97). During the same year, 2,322 persons were hospitalized for firearm injuries and 3,691 were hospitalized for stab injuries. Typically, injury surveillance relies primarily upon data obtained from death certificates and hospitalizations. These data are generally available after a delay of approximately 18 months. Under such a system, there is no mechanism for obtaining timely information about persons with less severe injuries that did not result in hospitalization or death.

To close this injury surveillance gap, the Injury and Violence Prevention Program initiated surveillance for firearm and stabbing weapon-related injuries among patients receiving emergency medical care at four DHS hospital emergency departments (Harbor-UCLA Medical Center [HUMC], LAC+USC Medical Center [LAC+USC], M.L. King, Jr/Drew Medical Center [MLK], Olive View Medical Center [OVMC]), and acute rehabilitation care at Rancho Los Amigos Medical Center (RLAMC). The surveillance system was initiated in February 2000; data collection was retrospective to January 1, 1998. This report summarizes data for January 1998 through December 2000.

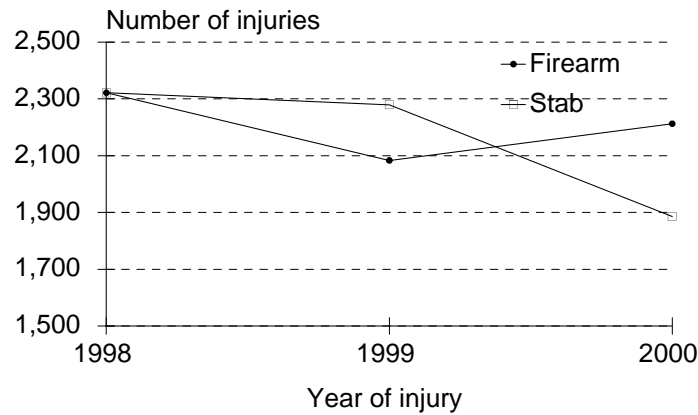
**Firearm injuries.** From January 1998 through December 2000, 6,616 emergency department and acute rehabilitation visits for firearm injuries were reported by five DHS hospitals (Table 1). The number of firearm injury visits decreased 10% from 1998 to 1999, and then increased 6% from 1999 to 2000 (Figure 1). Each year, the greatest number of visits was reported by LAC+USC.

In 2000, 2,075 persons made 2,212 visits for firearm injuries; 50% were Latino (Table 2), 91% were male, and 81% were 15-34 years of age (Table 3). Multiple visits were made by 125 persons. Overall, the intent of the injury was reported for 75% of the visits (Table 4). Most of the injuries were reported as assaults. From 1999 to 2000 the number of visits for firearm assaults increased 31%. In 2000, the average charge for a firearm injury visit ranged from \$6,754 at OVMC to \$15,024 at HUMC (Table 5). The total charges in 2000 exceeded 24 million dollars.

**Table 1. Number of firearm injury visits at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 1998-2000.**

Hospital	1998	1999	2000	Total
	No.	No.	No.	No.
HUMC	471	386	454	1,311
LAC+USC	923	849	899	2,671
MLK	847	770	790	2,407
OVMC	45	44	28	117
RLAMC	35	34	41	110
<b>Total</b>	<b>2,321</b>	<b>2,083</b>	<b>2,212</b>	<b>6,616</b>

**Figure 1. Weapon-related injuries at four DHS emergency departments and one DHS acute rehabilitation department, by year, WRISS, Los Angeles County, 1998-2000.**



**Table 2. Race/ethnicity of patients treated for firearm injuries at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 2000.**

Race/ Ethnicity	Hospital										Total	
	HUMC		LAC+US C		MLK		OVMC		RLAMC			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	% <sup>1</sup>
White	26	6%	54	6%	9	1%	3	11%	na	-	92	5%
Black	144	34%	160	19%	455	62%	5	18%	na	-	764	38%
Latino	220	53%	573	67%	209	28%	18	67%	na	-	1,020	50%
Asian	11	3%	10	1%	7	1%	0	0%	na	-	28	1%
Other/ Unk	16	4%	57	7%	56	8%	1	4%	na	-	130	6%
<b>Total</b>	<b>417</b>		<b>854</b>		<b>736</b>		<b>27</b>		<b>41</b>		<b>2,075</b>	

<sup>1</sup>Percents are based on the 2,034 patients for whom race/ethnicity was reported.  
na=Not available

**Table 3. Age of patients treated for firearm injuries at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 2000.**

Age (years)	Hospital											
	HUMC		LAC+USC		MLK		OVMC		RLAMC		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	% <sup>2</sup>
0-14	12	3%	13	1%	25	3%	0	0%	na	-	50	2%
15-19	90	22%	252	30%	183	25%	3	11%	na	-	528	26%
20-25	129	31%	220	26%	223	30%	14	52%	na	-	586	29%
25-34	118	28%	236	28%	169	23%	5	19%	na	-	528	26%
35-44	41	10%	89	10%	90	12%	3	11%	na	-	223	11%
45-64	23	5%	38	4%	42	6%	2	7%	na	-	105	5%
65+	4	1%	6	1%	4	1%	0	0%	na	-	14	1%
Total	417		854		736		27		41		2,075 <sup>2</sup>	

<sup>2</sup>Percents are based on the 2,034 patients for whom age was reported.  
na=Not available

**Table 4. Visits for firearm injuries at four DHS emergency departments and one DHS acute rehabilitation department by intent, WRISS, Los Angeles County, 1998-2000.**

Intent of injury <sup>3</sup>	1998		1999		2000		Total	
	No.	%	No.	%	No.	%	No.	%
Unintentional	679	29%	854	41%	617	28%	2,150	33%
Self-inflicted	10	0%	14	1%	7	0%	31	1%
Assault	954	41%	772	37%	1,013	46%	2,739	41%
Legal intervention	3	0%	7	0%	13	1%	23	0%
Undetermined	675	29%	436	21%	562	25%	1,673	25%
Total	2,321		2,083		2,212		6,616	

<sup>3</sup>External cause of injury codes were not reported by OVMC and RLAMC. External cause of injury codes were reported by LAC+USC after September 2000. For records without an external cause of injury code, the description of the injury was reviewed for keywords suggestive of the intent, i.e., assault, accident, suicide. If the description did not contain one of the keywords, the intent of the injury was classified as undetermined.

**Table 5. Average charge<sup>4</sup> per visit for firearm injury at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 1998-2000.**

Hospital	1998	1999	2000	Total
	Average charge/visit	Average charge/visit	Average charge/visit	Average charge/visit
HUMC	\$10,726	\$8,641	\$15,024	\$11,598
LAC+USC	\$857	\$1,253	\$10,850	\$4,534
MLK	\$22,045	\$18,704	\$9,983	\$17,090
OVMC	\$4,175	\$6,203	\$6,754	\$5,488
RLAMC	na	na	na	na

<sup>4</sup>Excludes 45 records missing charge information. Hospitals differed in their ability to report emergency department charges. After September 2000, charge information from LAC+USC included inpatient charges, when applicable. na=Not available

**Stab injuries.** From January 1998 through December 2000, 6,486 emergency department and acute rehabilitation visits for stab injuries were reported by five DHS hospitals (Table 6). The number of stab injury visits decreased 19% from 1998 to 2000. Each year, the greatest number of visits was reported by HUMC.

In 2000, 1,848 persons made 1,886 visits for stab injuries; 55% of the persons treated for stab injuries were Latino (Table 7), 76% were male, and almost half were 25-44 years of age (Table 8). Thirty-eight people made more than one visit for a stab injury. The majority of stab injuries were reported to be unintentional (Table 9). In 2000, the average charge for a stab injury visit ranged from \$3,093 at HUMC to \$6,644 at OVMC (Table 10). The total charges in 2000 exceeded 11 million dollars.

**Table 6. Number of stab injury visits at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 1998-2000.**

Hospital	1998	1999	2000	Total
	No.	No.	No.	No.
HUMC	1,301	1,087	811	3,199
LAC+USC	540	737	675	1,952
MLK	451	419	379	1,249
OVMC	29	34	21	84
RLAMC	0	2	0	2
Total	2,321	2,279	1,886	6,486

**Table 7. Race/ethnicity of patients treated for stab injuries at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 2000.**

Race/ ethnicity	Hospital											
	HUMC		LAC+US C		MLK		OVMC		RLAMC		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
White	131	16%	56	8%	2	0%	3	14%	na	-	192	10%
Black	150	19%	117	18%	194	53%	0	0%	na	-	461	25%
Latino	443	55%	426	65%	142	39%	14	67%	na	-	1,025	55%
Asian	49	6%	17	3%	0	0%	0	0%	na	-	66	4%
Other/ Unk	28	4%	43	6%	29	8%	4	19%	na	-	104	6%
Total	801		659		367		21		0		1,848	

na=Not available

**Table 8. Age of patients treated for stab injuries at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 2000.**

Age (years)	Hospital											
	HUMC		LAC+US C		MLK		OVMC		RLAMC		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-14	139	17%	20	3%	19	5%	0	0%	na	-	178	10%
15-19	103	13%	80	12%	62	17%	5	24%	na	-	250	13%
20-25	122	15%	111	17%	60	16%	5	24%	na	-	298	16%
25-34	196	25%	194	29%	85	23%	9	43%	na	-	484	26%
35-44	139	17%	139	21%	89	24%	1	5%	na	-	368	20%
45-64	88	11%	105	16%	48	13%	1	5%	na	-	242	13%
65+	14	2%	10	2%	4	1%	0	0%	na	-	28	2%
Total	801		659		367		21		0		1,848	

na=Not available

**Table 9. Visits for stab injuries at four DHS emergency departments and one DHS acute rehabilitation department by intent, WRISS, Los Angeles County, 1998-2000.**

Intent of injury <sup>5</sup>	1998		1999		2000		Total	
	No.	%	No.	%	No.	%	No.	%
Unintentional	1,435	62%	1,623	71%	1,103	59%	4,161	64%
Self-inflicted	25	1%	30	1%	91	5%	146	2%
Assault	541	23%	461	20%	516	27%	1,518	23%
Undetermined	320	14%	165	7%	176	9%	661	10%
<b>Total</b>	<b>2,321</b>		<b>2,279</b>		<b>1,886</b>		<b>6,486</b>	

<sup>5</sup>External cause of injury codes were not reported by OVMC and RLAMC. External cause of injury codes were reported by LAC+USC after September 2000. For records without an external cause of injury code, the description of the injury was reviewed for keywords suggestive of the intent, i.e., assault, accident, suicide. If the description did not contain one of the keywords, the intent of the injury was classified as undetermined.

**Table 10. Average charge<sup>6</sup> per visit for stab injury at four DHS emergency departments and one DHS acute rehabilitation department, WRISS, Los Angeles County, 1998-2000.**

Hospital	1998	1999	2000	Total
	Average charge/visit	Average charge/visit	Average charge/visit	Average charge/visit
HUMC	\$2,589	\$2,965	\$4,079	\$3,093
LAC+USC	\$860	\$1,181	\$10,337	\$4,259
MLK	\$7,650	\$5,212	\$4,748	\$6,072
OVMC	\$4,555	\$5,324	\$12,314 <sup>7</sup>	\$6,644
RLAMC	na	na	na	na

<sup>6</sup>Excludes 126 records missing charge information; 113 of the records missing charge information were from MLK in 2000. Hospitals differed in their ability to report emergency department charges. After September 2000, charge information from LAC+USC included inpatient charges, when applicable.

<sup>7</sup>One visit had charges of \$111,099. The next highest charge for a single visit was \$20,916.  
na=Not available

**Discussion.** Different data and reporting systems used by the participating hospitals may result in different case ascertainment levels for each of the hospitals. The data in this report are most useful for analyzing hospital-specific and overall trends rather than direct comparisons between hospitals. The surveillance data are used by Public Health, law enforcement, and social service agencies to monitor trends in violence and injuries related to firearms and stabbings, evaluate the effectiveness of violence and injury prevention programs, and identify gaps in coverage in prevention programs for both intentional and unintentional injuries. While law enforcement agencies monitor and respond to the incidence of weapon-related crimes throughout the County, they do not monitor the incidence of unintentional and self-inflicted injuries, which contribute significantly to the overall impact of weapon-related injuries.

The medical charges contained in this report should be viewed cautiously. The participating hospitals differ in their ability to segregate emergency department charges from charges for other services. While the intent was to report on emergency department charges alone, the wide variability in hospital-specific charges suggest that charges for other services may be included. We know that after September 2000, charges reported by LAC+USC included some inpatient care. We are reviewing each hospital's data collection system and are identifying ways to validate the charge data provided. During 2000, the reported emergency department charges for weapon-related injuries exceeded 36 million dollars. For every dollar charged for stab injuries, the charges for firearm injuries were \$2.11 even though there was one stab injury for every 1.2 firearm injuries.

While this report may overestimate emergency department charges for weapon-related injuries, the charges reported are far less than the total medical charges for weapon-related injuries which would include inpatient charges for more serious injuries and outpatient charges for patients not treated in emergency departments as well as follow-up and rehabilitative care. The most useful surveillance system would be one in which records for emergency department, inpatient and outpatient medical care, and death records could be linked. This is not feasible with current injury surveillance systems in Los Angeles County.

Latinos comprised 50% and 55%, respectively, of the persons treated for firearm and stab injuries. Thirty-eight percent of the persons treated for firearm injuries were black compared with 25% for stab injuries. The race distribution of persons treated at LAC+USC was similar for firearm and stab injuries. At HUMC, a greater proportion of persons treated for stab injuries were white compared with firearm injuries.

The accuracy of hospital reporting of the intent of firearm or stab injuries is not known. One-third of the firearm injuries were reported to be unintentional and 1% were self-inflicted. In 1998, less than one percent of firearm fatalities were from unintentional injuries and one third were self-inflicted (unpublished data, 1998 Death Statistical Master File, Center for Health Statistics, California Office of Vital Records). The difference in the proportion of unintentional and self-inflicted firearm injuries from death certificates compared with data for patients receiving emergency/acute rehabilitation care may reflect inaccurate or incomplete reporting, or true differences in the intent. It is more likely due to the high lethality of self-inflicted gunshot wounds. Persons with self-inflicted gunshot wounds are more likely to die than persons with other types of self-inflicted injuries.<sup>7</sup>

The number of visits for firearm injuries increased from 1999 to 2000 while the number of stab injury visits decreased. The increase in firearm injury visits is consistent with trends for Los Angeles County from other sources. Both the Los Angeles Police Department<sup>8</sup> and the Los Angeles Sheriff's Department (Billie Weiss, personal communication) report an increase in violent crime from 1999 to 2000. The Office of the Coroner also reports an increase in firearm homicides from 1999 to 2000. Provisional mortality data for 2000 also suggests an increase in firearm deaths from 1999.

This report provides the number of visits for weapon-related injuries. While it is known that some persons had more than one visit, we are unable to determine if the visits were for multiple injury episodes, or repeat visits for the same injury. Additionally, an individual may have visited more than one facility. This is particularly true for RLAMC where many patients are transferred for acute rehabilitation from other DHS facilities. Therefore, these data can be used to estimate the magnitude of weapon-related injuries in relation to other types of injuries, measure the impact of weapon-related injuries on DHS facilities, estimate the medical cost of weapon-related



injuries, and quantify the demand for services related to these injuries, however, they cannot be used to estimate risk.

The Injury and Violence Prevention Program will continue to conduct surveillance for weapon-related injuries at the five participating DHS hospitals. The surveillance data will be used to identify trends in violence and injuries related to firearms and stabbings, and to evaluate violence and injury prevention programs.

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<sup>7</sup> Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. Am J Public Health. 2000;90:1885-1891.

<sup>8</sup>Crime statistics – Year 2000, Los Angeles Police Department, <http://www.lapd.org>.