

Introduction

Injuries have an enormous impact on Los Angeles County residents — they are the leading cause of death among 1-44 year olds. Countywide, around 4000 residents die each year from injuries. However, fatalities account for only a small portion of all injury occurrences. Between 2000 and 2005, for every injury death, there were more than 16 non-fatal injuries that required inpatient treatment. This amounts to more than 65,000 injury hospitalizations each year. In addition to all the injuries treated in hospitals, many more less severe injuries were treated in emergency departments and doctor's offices.

This report focuses on non-fatal hospitalized injuries in Los Angeles County. It is important to look at patterns of non-fatal injuries since they may be quite different from injury fatalities (which were discussed in a previously released report¹). For example, firearms caused nearly half of all completed suicides since 2000, but were responsible for less than one percent of all non-fatal suicide attempts. Injury hospitalizations are also important because these severe injuries frequently have a long lasting impact; in addition to initial treatment, many injuries require long-term rehabilitation and may result in permanent disability.

To better explain how injuries affect Los Angeles County residents, this report begins with an overview of injury hospitalizations that discusses what types of injuries are most prevalent and which county residents are most at risk for injury hospitalizations. The next several sections of the report focus on each of the most common causes of injury hospitalizations. Each of these sections compare Los Angeles County statistics with statewide data, show trends over time in hospitalizations, provide information on the populations most affected by that particular type of injury, compare patterns of injury hospitalizations with those of fatal injuries, and discuss prevention strategies for the injury type. Finally, six appendices contain more information including, detailed charts of the top ten causes of injury hospitalization broken down by age, gender, and racial group; definitions for terms used in the report; technical notes; and a resource list for more information about injuries.

For this report, injuries and hospitalizations are categorized by mechanism (e.g., firearms, falls, motor vehicle traffic), and by intent (e.g., assault, unintentional) using guidelines found in the Centers for Disease Control and Prevention's *Recommended Framework for Presenting Injury Mortality Data*.² Appendix I presents data on the large number of injuries that were not able to be placed in one of the *Framework's* mechanism groupings.

¹ Los Angeles County Department of Public Health. Injury and Violence Prevention Program. Report on Injury Related Morbidity and Mortality in Los Angeles County: Prevalence and Prevention. 2005.

² Centers for Disease Control and Prevention. Recommended Framework for Presenting Injury Mortality Data. *Morb Mortal Wkly Rep*. 1997;46(RR14):1-30.

All hospitalization data used in this report cover the years from 2000-2006 and were provided by the California Office of Statewide Health Planning and Development (OSHPD). Throughout this report, no numbers less than 6 were reported. If there were 5 or fewer hospitalizations in a particular group, that group was combined with another to ensure that patient confidentiality was maintained.

This report was prepared to provide detailed information about injury risks and prevention strategies that can be used by a wide range of Los Angeles County residents, including community groups, medical professionals, and other individuals and organizations. The report was written by the staff of the Injury and Violence Prevention Program (IVPP), which is part of the Division of Chronic Disease and Injury Prevention within the Los Angeles County Department of Public Health. IVPP's mission is to reduce and prevent injuries among Los Angeles County residents. IVPP measures and monitors the occurrence of injuries among population groups, and develops and implements strategies to reduce the morbidity and mortality caused by injuries. For more information about IVPP or to request additional data, please contact us at (213) 351-7888, or visit our website at www.publichealth.lacounty.gov/ivpp

Isabelle Sternfeld, MSPH
Epidemiologist, Injury and Violence Prevention Program

Patti Culross, MD, MPH
Director, Injury and Violence Prevention Program

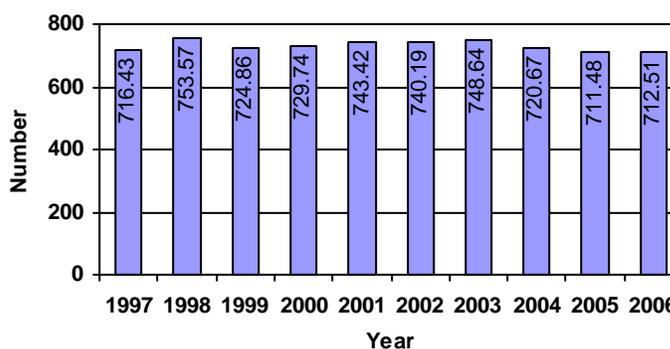
Overview: All Injury Hospitalizations

During the seven years between 2000 and 2006, there were 468,282 injury hospitalizations in Los Angeles County, an average of more than 66,000 each year. During this time, the average annual age adjusted hospitalization rate for injuries was 727 per 100,000 population. In California between 2000 and 2005 (statewide data are not yet available for 2006), there were nearly 1.5 million injury-related hospital discharges. Just over one-quarter of these visits, 400,281 in total, were made by residents of Los Angeles County.

Trends

There were nearly half a million injury hospitalizations in Los Angeles County between 2000 and 2006. Over the past decade the annual age-adjusted injury rate has remained fairly consistent (Figure 1).

Figure 1: Injury Hospitalization Rate per 100,000 Population by Year, Los Angeles County, 1997-2006



Mechanism

Over half of all injury hospitalizations were caused by fall (41%) and motor vehicle traffic (12%) injuries (Table 1). A significant number of injuries (14%) were grouped into one of three categories that did not describe a particular type of injury.¹ Other injury types in the top ten were poisonings, including drug overdoses, struck by or against (e.g., assaults), cut/pierce (e.g., stabbings), firearms, and natural & environmental injuries (e.g., bee stings, animal bites and hypothermia).

Table 1: Leading Causes of Injury Hospitalization and Age Adjusted Hospitalization Rates per 100,000 Population, Los Angeles County, 2000-2006

Cause of Injury Hospitalization	Number	Rate
1. Falls	194,028	322.8
2. Motor Vehicle Traffic	58,506	85.0
3. Poisoning	44,619	65.8
4. Unspecified	29,511	46.6
5. Struck by or Against	22,413	32.2
6. Other Classified	21,767	32.6
7. Cut/Pierce	21,474	30.3
8. Other Specified, Not Classifiable	15,545	23.2
9. Firearms	14,619	20.1
10. Natural & Environmental	9,583	14.3

Intent

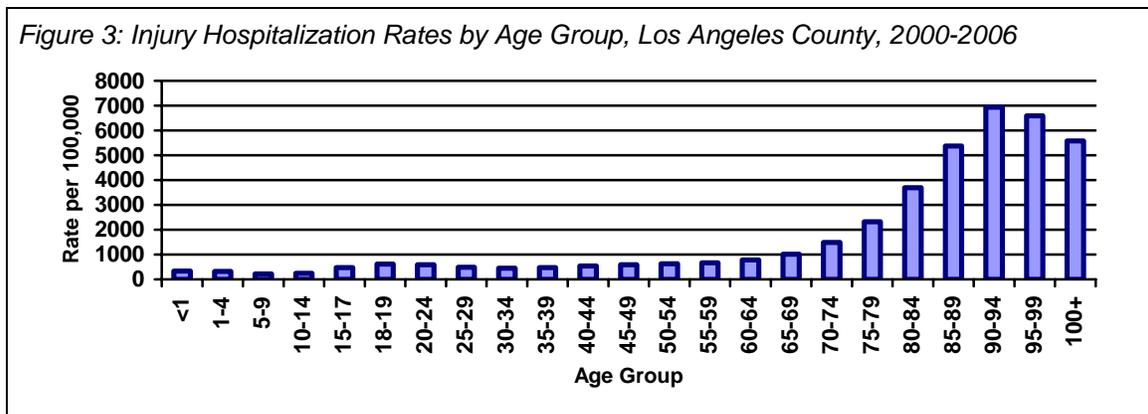
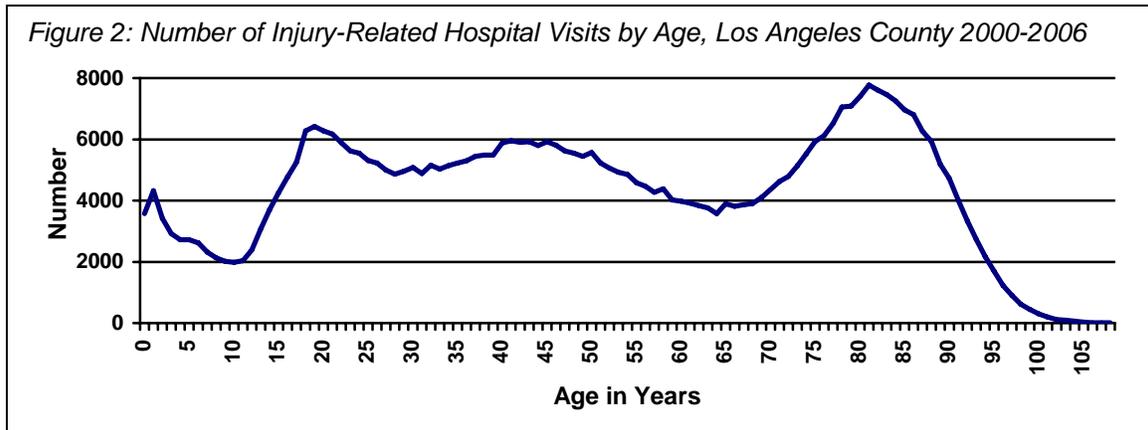
Injuries are classified by intent as unintentional, intentional, or undetermined. Unintentional injuries are those commonly referred to as accidental. Intentional

¹ These causes (#s 4, 6, and 8) are not discussed in individual sections in this report; data on these injuries are presented in Appendix I.

injuries include assaults, suicide attempts, and legal intervention. Some injury mechanisms can be intended or unintended. For example, poisoning can result from an unintended overdose of medication or from an intended overdose in a suicide attempt. Occasionally intent cannot be determined and these injuries are simply categorized as undetermined. Determining the intent of an injury can assist in the development of prevention strategies.

The majority (84%) of injury hospitalizations were for unintentional injuries. Another 8% were for assaults and 6% were for suicide attempts. The remaining hospitalizations were for injuries of undetermined intent and legal intervention injuries. The mechanism of injury varied considerably with injury intent. Just under half of the unintentional injuries were caused by falls and another 15% were attributed to motor vehicle traffic. Most assault injuries were caused by firearms (32%), struck by or against injuries (26%), or cut/pierce injuries (17%). Nearly three quarters of suicide attempts were caused by poisonings and another 17% were attributed to cut/pierce injuries. Two thirds of injuries of undetermined intent were caused by poisonings and over one third of legal intervention hospitalizations were caused by struck injuries.

Age



Overall, the average age of a patient hospitalized for an injury was 50.6 years. More than one third of all people hospitalized for an injury were over the age of 64. In fact, during the seven year period, there were more injury hospitalizations among 81 year olds, with 7,772 hospital discharges, than for any other single age group (Figure 2). Injury rates increased dramatically among the older population, peaking among 90-94 year olds, who experienced a hospitalization rate of more than 6900 visits per 100,000 population (Figure 3). Injury hospitalizations were least common among children 5-14 years old. Hospitalization rates for 5-14 year olds were less than 300 visits per 100,000 population.

Table 2: Age Specific Hospitalization Rates by Intent, Los Angeles County, 2000-2006

Age Group	Unint.	Sui.	Assault	Legal*	Undet.
<1 Year	298.66	**	30.46	**	6.66
1-4 Years	307.62	**	5.24	**	2.44
5-9 Years	210.74	**	2.41	**	0.85
10-14 Years	204.17	19.32	13.11	**	2.60
15-19 Years	309.74	80.78	129.15	1.18	10.46
20-24 Years	359.23	73.70	148.89	1.81	11.77
25-29 Years	313.87	58.40	98.79	1.76	10.87
30-34 Years	307.25	53.45	70.69	1.73	10.92
35-44 Years	368.51	59.19	66.20	1.53	14.53
45-54 Years	484.34	52.21	47.49	1.28	17.06
55-64 Years	646.96	30.41	26.12	0.94	14.21
65+ Years	2372.2	21.56	16.27	1.00	13.45

All rates are per 100,000.
** Legal intervention includes operations of war & terrorism.*
*** Rates not shown because of small numbers.*

Falls were the leading cause of injury hospitalizations for 0-14 year olds and for people 35 years and older,

while poisoning was the leading cause among 15-16 year olds and MV traffic was the leading cause for 17-34 year olds. Falls never ranked lower than the 5th leading cause of injury hospitalization. For more details on leading causes of hospitalization by age group, please see the tables in Appendix VI.

Within all age groups, unintentional injuries were far more common than intentional injuries (Table 2). Unintentional injuries were highest among people over 65 years old; the rate for that age group was more than three times higher than the rate for any other age group. Both assault and suicide attempt hospitalization rates were highest among youth 15-24 year olds. For most age groups, the number of assault hospitalizations was higher than the number of suicide attempt hospitalizations. However, among young adolescents (10-14 years old) and older adults (45+ years old) the rate of suicide attempts was higher than the rate of assault hospitalizations. Hospitalizations of undetermined injury intent peaked among 45-54 year olds. On average, victims of assaults were the youngest (average age = 31.7 years), followed by suicide attempts (35.7 years), legal intervention (39.1 years), undetermined intent (42.0 years), and unintentional (53.5 years).

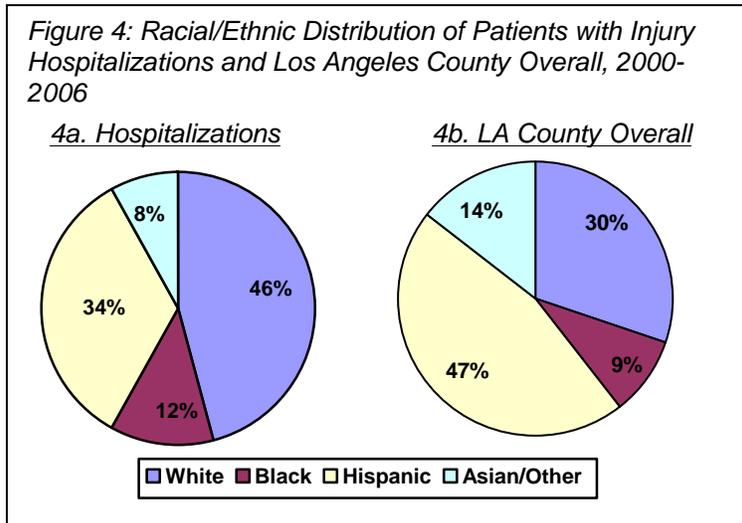
Gender

Males accounted for just over half (53%) of all injury hospitalizations. The gender distribution for unintentional injury hospitalizations (51% male) was

similar, but among assault-related hospitalizations there were many more males (86%), while among hospitalizations for suicide attempts, there were more females (59%). There were also more females than males among patients hospitalized for fall (59% female) and poisoning (57% female) related injuries. Women, on average, were hospitalized at an older age than men (average age of 58.6 years vs. 43.5 years).

Race/Ethnicity

The racial/ethnic group of the patient was reported for more than 97% of hospital discharges. All the statistics presented in this section are based on only those patients for whom race/ethnicity was reported. Just under half (46%) of these patients were White, one third (34%) were Latino, 12% were Black, and 8% were Asian/Other. Whites and Blacks were both



overrepresented among hospitalized patients compared to the county’s overall population (Figure 4). Whites were the oldest patients on average (60.6 years), followed by Asian/Others (54.7 years), Blacks (44.0 years), and Hispanics (38.6 years). The average age of patients of unknown race/ethnicity was 48.1 years.

There was significant variation in racial/ethnic distribution by the mechanism of injury. Whites accounted for 56% of all fall-related hospitalizations, but only 38% of all other injury related hospitalizations. Blacks accounted for 34% of firearm hospitalizations, but just under 12% of all other injury related hospitalizations. Hispanics were also overrepresented among firearm-related hospitalizations, accounting for 54% of those discharges, but only 33% of all other hospitalizations. There was less variation in the proportion of Asians/Others found for each type of injury; the greatest proportion of Asians/Others was found for drowning-related hospitalizations (15% Asians/Others) and the smallest

Table 3: Total Number of Hospitalizations and Average Annual Age Adjusted Hospitalization Rate by SPA, Los Angeles County, 2000-2006

SPA	Number	Rate
SPA 1: Antelope Valley	17,798	879.8
SPA 2: San Fernando	96,027	709.7
SPA 3: San Gabriel	77,393	646.5
SPA 4: Metro	61,494	788.4
SPA 5: West	30,892	666.4
SPA 6: South	56,589	920.4
SPA 7: East	56,868	680.7
SPA 8: South Bay	71,181	698.2
Unknown SPA	40	---
Los Angeles County Total	468,282	726.5

Note: Rates are per 100,000 population.

proportion was found for firearm injury hospitalizations (3% Asians/Others).

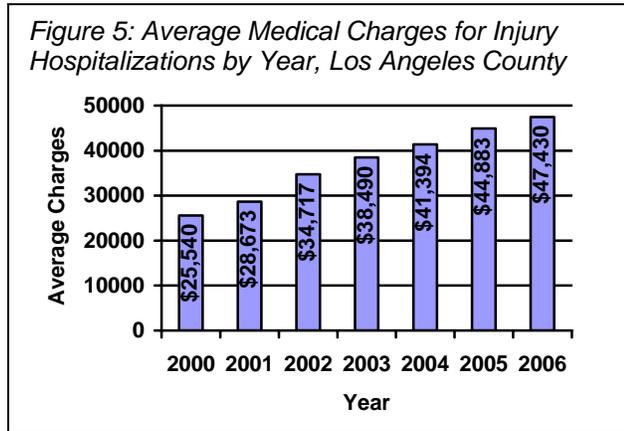
Geography

The greatest number of injury hospitalizations was found among residents of the San Fernando SPA (Table 3). The Antelope Valley had by far the lowest number of hospitalizations, but the second highest rate of any SPA. Injury hospitalization rates were highest in the South SPA and lowest in the San Gabriel SPA.

Falls and motor vehicle collisions were the top two causes of injury hospitalization within each SPA, but while falls accounted for about one third of hospitalizations in the Antelope Valley (33%) and the South (29%) SPAs, they accounted for over half of all hospitalizations in the West (51%) SPA. There was less variation in motor vehicle traffic related hospitalizations, which ranged from 11% of injuries in the West to 17% in the Antelope Valley. The South SPA accounted for just 12% of all injury hospitalizations, but for 38% of all firearm hospitalizations.

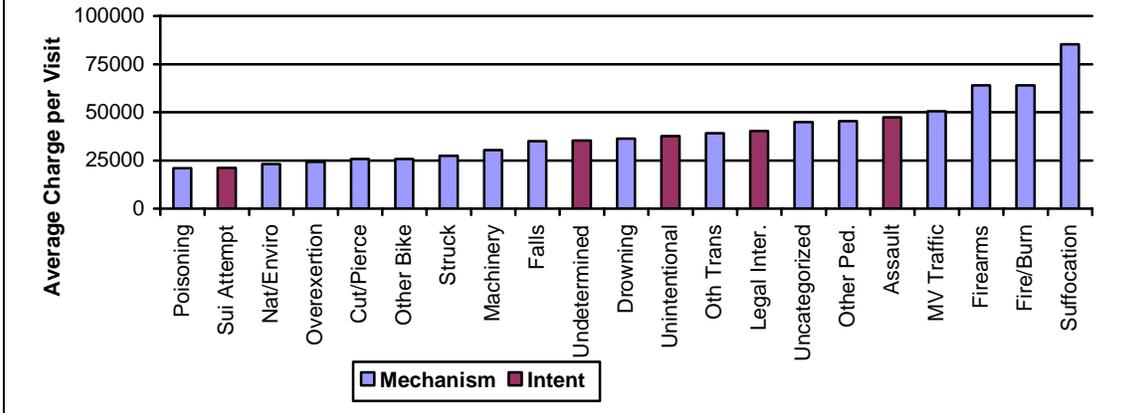
Medical Charges

The average medical charge incurred for each inpatient injury-related hospitalization was more than \$37,000. Medical charges increased dramatically each year (Figure 5), with the average annual charge for an injury visit nearly doubling between 2000 (\$25,540 per visit) and 2006 (\$47,430 per visit).



Average charges varied significantly by injury mechanism and intent (Figure 6). Suffocation injuries such as from choking or hanging, were the most expensive to treat, with average charges of more than \$85,000 per visit. Fire/burn injuries and firearm injuries were the next most costly, with average per visit charges over \$60,000. In contrast, average charges for injury hospitalizations due to natural or environmental causes, overexertion, and poisoning were less than \$25,500. Looking at the injuries by intent, hospitalizations due to assaultive injuries had the highest medical charges (\$47,416 per visit) and suicide attempts (\$21,103) were the least costly.

Figure 6: Average Medical Charge per Hospitalization by Mechanism and Intent of Injury, Los Angeles County, 2000-2006



Comparison to Mortality Data

Mortality data is only available through 2005, so the comparisons in this section are only for the 6 years from 2000 through 2005. During that time there were 16.5 hospitalizations for each injury fatality in Los Angeles County (Table 4). Unintentional injuries made up a much larger proportion of hospitalizations than fatalities, while suicides and homicides accounted for a greater percentage of fatalities. There was a greater percentage of Blacks among injury fatalities and a greater percentage of Whites among injury hospitalizations. In addition, males accounted for a much greater percentage of injury fatalities than of injury hospitalizations. The average age of hospitalized victims was slightly higher than that of injury fatalities. During the six year period, falls accounted for only 9% of injury deaths, but were responsible for 40% of hospitalizations. In contrast, firearms and motor vehicle traffic injuries accounted for 30% and 22%, respectively, of fatalities, but only 3% and 13% of hospitalizations.

Table 4: Demographics of Fatal Injuries and Non-Fatal Injury Hospitalizations, Los Angeles County 2000-2005

	Deaths	Hosps
Total Number	24,261	400,281
Intent (%)		
Unintentional	53.8%	83.7%
Suicide/Sui Attempt	17.8%	6.2%
Homicide/Assault	26.5%	8.3%
Legal Intervention	<1%	<1%
Undetermined	1.5%	1.6%
Race/Ethnicity (%)		
Black	18.1%	12.0%
Latino	36.8%	33.2%
White	37.2%	44.8%
Asian/Other	7.5%	7.7%
Unknown	<1%	2.2%
Gender (%)		
Male	75.4%	53.5%
Female	24.6%	46.5%
Average Age (Years)	43.4	50.3