Traffic Safety Reports: Pedestrian Injuries in California 2007-2013

June 2017

Introduction

Walking is the oldest, most basic, and beneficial form of human transportation that provides many personal and societal benefits.[1,2] The number of individuals walking in the United States is steadily increasing.[1] Unfortunately, pedestrians represent a growing percentage of total traffic fatalities.[3] In 2007 pedestrian fatalities comprised 11 percent of all traffic deaths nationwide and 15 percent in 2013.[3] This report presents California 2007-2013 data on the overall frequency, severity, and characteristics of fatal and non-fatal pedestrian injuries involving motor vehicles, using the California Highway Patrol's (CHP) Statewide Integrated Traffic Records System (SWITRS) data.[4] The pedestrian injury information is presented as follows:

- Overview
- Environmental Characteristics
- Time of Day and Day of the Week
- Age Groups
- Gender
- Alcohol Involvement
- Fatal Injuries by County
- Non-Fatal injuries by County, and
- Summary

Highlights

- Pedestrian fatality rates increased by 11%, from 1.8 per 100,000 (2007) to 2.0 per 100,000 California residents (2013).
- In contrast, pedestrian non-fatal injury rates decreased by 13.5% from a high of 39 per 100,000 in 2007 to 32 per 100,000 in 2013.
- Most pedestrian injuries occurred in fall (35%) followed by summer and winter (31%).
- Majority of the pedestrian injuries occurred from 3 p.m. to 8:59 p.m., while the least occurred from 3 a.m. to 5:59 a.m.
- One-fifth (21%) of total persons killed in traffic crashes were pedestrians.
- One-third (29%) of children 14 and younger killed in traffic crashes were pedestrians.
- 33% of all pedestrians killed and 7% of all pedestrian non-fatal injuries were comprised of people 65 and older.
- More than two-thirds (68%) of the pedestrians fatalities in traffic crashes were males and the pedestrian fatality rate (2.4) is more than double the rate of females (1.1 per 100,000).
- Pedestrians 45 to 54 years old who were drinking had the highest fatality rate (1.2 per 100,000) compared to other age groups.
- Kern and Humboldt were the top two counties for pedestrian fatalities.
- San Francisco and Los Angeles were the top two counties for non-fatal pedestrian injuries.

Overview

In California there was an average of about 238,000 fatal and non-fatal traffic injuries annually from 2007-2013, for a total of nearly 1.7 million injuries. Table 1 presents a distribution of all pedestrian injuries (fatal and non-fatal combined) as a percentage of total motor vehicle traffic injuries from 2007 to 2013. Pedestrian traffic injuries comprised nearly 6 percent (n=95,758) of the total traffic injuries, of which 95 percent were non-fatal and 5 percent were fatal injuries. Overall, the 13,083 pedestrian injuries in 2013 represent a nearly 9 percent decrease from 14,329 pedestrian injuries in 2007. Pedestrian age-adjusted fatality rates increased by 11 percent from 1.8 per 100,000 residents in 2007 (n=666) to 2.0 per 100,000 in 2013 (n=752). In contrast, pedestrian age-adjusted non-fatal injury rates decreased by 13.5 percent from a high of 39 per 100,000 in 2007 (n=13,663) to 32 per 100,000 in 2013 (n=12,331).

Table 1: Total Fatal and Non-Fatal Traffic and Pedestrian Injuries, 2007-2013

Year	Total Injuries number	Total Pedestrian Injuries number	Percent of Total Injuries	Total Injury Rate*	Pedestrian Injury Rate*	95% CI**
2007	270,654	14,329	5.3	731.9	39.0	37.6 - 40.4
2008	245,274	14,047	5.7	657.0	38.0	36.6 - 39.4
2009	235,853	13,679	5.8	627.1	36.7	35.3 - 38.1
2010	232,093	13,291	5.7	612.0	35.3	33.9 - 36.7
2011	228,437	13,347	5.8	597.8	35.1	33.7 - 36.5
2012	229,539	13,982	6.1	595.8	36.5	35.1 - 37.9
2013	226,232	13,083	5.8	583.4	33.9	32.5 - 35.3
Total	**1,668,082**	**95,758**	**5.7**	**629.1**	**36.4**	**35.0 - 37.8**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Age adjusted rates per 100,000 using California Population data (CDoF- CDPH-EPI Center) and Year 2000 US Standard Population Weights; **Confidence interval (CI) with lower and upper limits for Pedestrian injury rates

Environmental Characteristics

In this section, information on four environmental characteristics (i.e., geography, pedestrian location, light condition, and time of day and season) of where and when pedestrian injuries occurred during 2007-2013 are presented.

As shown in Table 2, the vast majority of fatal and non-fatal pedestrian injuries occurred in urban areas (98.6 percent) compared to rural areas (1.4 percent)[5] and thus the rates of pedestrian injuries were lower in rural areas (22.4 versus 36.9, respectively). In contrast, the rates for total traffic injuries were higher in rural areas than urban areas (i.e., 717 versus 636, respectively). In rural areas, the percentage of total fatal pedestrian injuries (2.1 percent) was significantly higher than the percentage of non-fatal pedestrian injuries (1.3 percent), although the rates were similar.

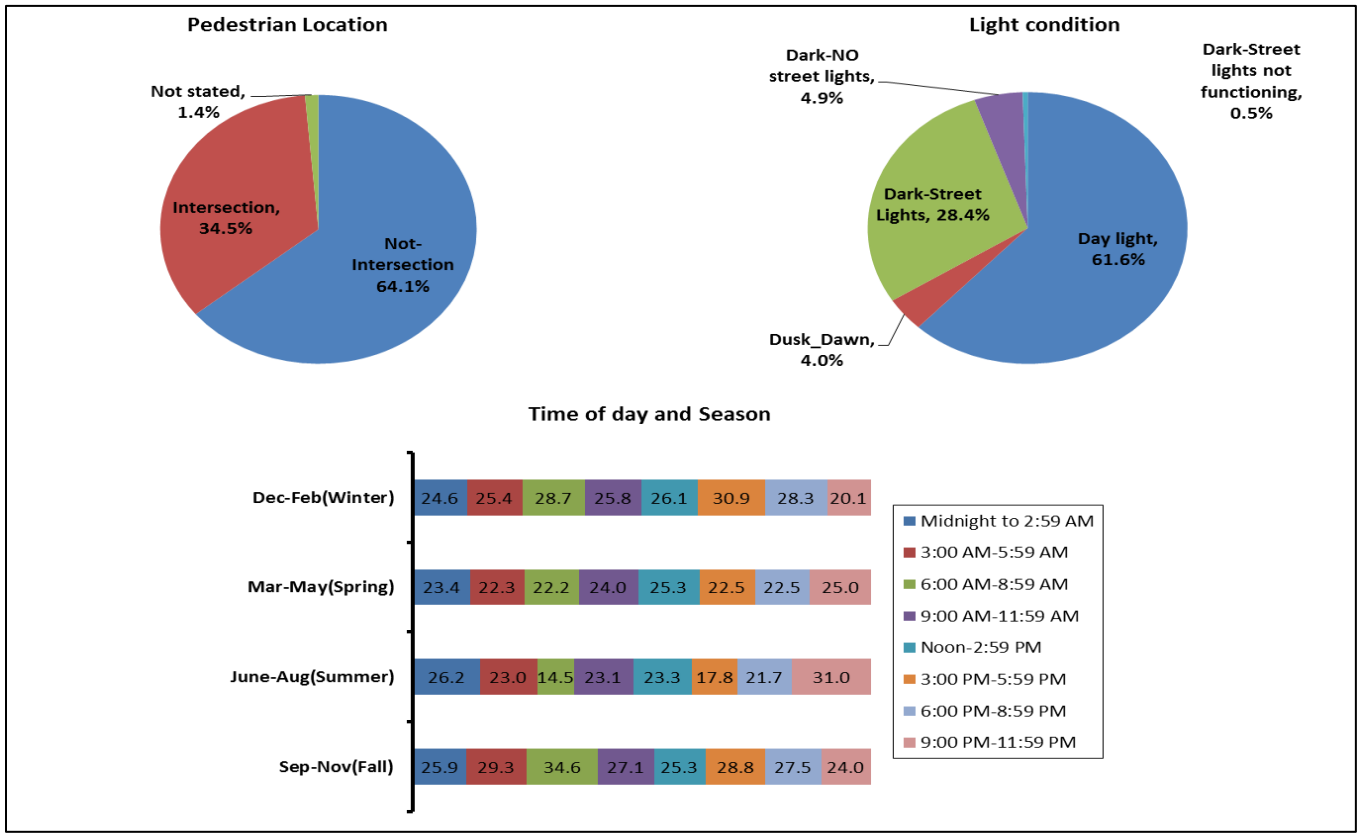
Table 2: Pedestrian Injuries in Traffic Crashes by Geography, 2007-2013

Region	Total number	Total percent	Total Rate **	Fatal number	Fatal percent	Fatal Rate**	Non-Fatal number	Non-Fatal percent	Non-Fatal Rate**
Urban	94,431	98.6	36.9	4,539	97.9	1.8	89,892	98.7	35.2
Rural	1,327	1.4	22.4	98	2.1	1.7	1,229	1.3*	20.7
Total	**95,758**	No data	**36.6**	**4,637**	No data	**1.8**	**91,121**	No data	**34.8**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013 * P<0.003 rural % fatal vs non-fatal injuries;** Age-specific rate per 100,000 using California Population data (from the CDoF- CDPH-EPI Center)

Figure 1 displays the role of pedestrian location, lighting, and time of day and season. The majority (64 percent) of pedestrian injuries occurred at not-intersections and during daylight hours (62 percent), but a substantial portion also occurred during the night time in areas with street lights (28 percent). In the winter months, around 30 percent of pedestrian injuries occurred between 6 a.m. to 8:59 a.m. and 3 p.m. to 8:59 p.m. In spring, about 25 percent of the pedestrian injuries occurred from 9 a.m. to 2:59 p.m. and 9 p.m. to 11:59 p.m. Nearly 30 percent of the pedestrian injuries occurred from 9 p.m. to 2:59 a.m. in summer months. In fall, the majority of pedestrian injuries occurred from 3 a.m. to 8:59 a.m.

Figure 1: Percentage of Fatal and Non-Fatal Pedestrian Injuries in Relation to Pedestrian Location, Light Condition, and *Time of Day and Season, 2007-2013

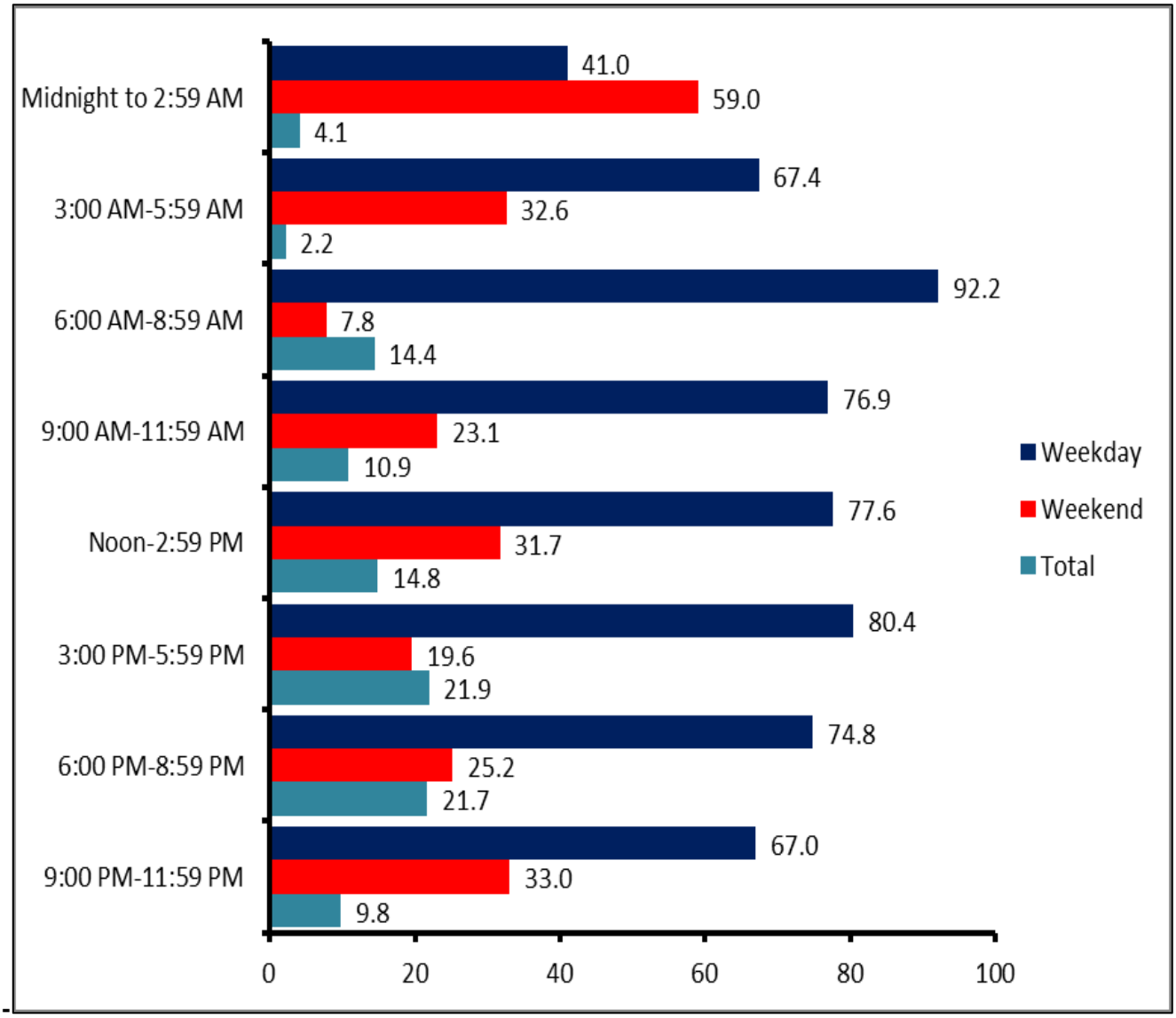


Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Time of day is divided into eight three-hour time intervals starting at midnight, and season is defined by months

Time of Day and Day of the Week

Figure 2 provides information on the time of day and day of the week of pedestrian traffic injuries. Over three-quarters of all pedestrian injuries occurred on weekdays during the daylight hours of 6 a.m. to 9 p.m. The highest percentages (22 percent) of total pedestrian injuries occurred from 3 p.m. to 5:59 p.m. and 6 p.m. to 8:59 p.m. and the lowest total percentage (2 percent) occurred from 3 a.m. to 5:59 a.m. followed by 4 percent from midnight to 2:59 a.m. At least two-thirds of all pedestrian injuries occur on weekdays for every time period except midnight to 2:59 a.m., where the pattern was reversed.

Figure 2: Percentage of Pedestrian injuries by *Time of day and Day of Week, 2007-2013.



Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Time of day is divided into eight three-hour time intervals starting at midnight, and day of week is defined as weekday (Monday-Friday) and weekend (Saturday-Sunday)

Age Groups

Tables 3 and 4 respectively, display the number of fatal and non-fatal pedestrian injuries by age group from 2007 to 2013. Table 3 shows one-fifth (21 percent) of the total persons killed in traffic crashes were pedestrians whereas for children 14 and younger and seniors 65 and above, one-third of these deaths were pedestrians (29.4 percent and 33.1 percent, respectively). Total traffic crash fatality rates were highest among the 15-24 age group (12.5) and 65+ adults (12.2). In contrast, the highest rates of pedestrian fatalities were among 65 and older age groups. The average age of pedestrians killed in traffic crashes was 50.

Table 3: Total Traffic and Pedestrian Fatalities, by Age Group, 2007-2013

Age group (years)	Total Fatalities number	Pedestrians Fatalities number	Percent of Total Fatalities	Total Fatality Rate*	Pedestrian Fatality Rate*
0-14	848	249	29.4	1.6	0.5
15-24	4,867	564	11.6	12.5	1.5
25-34	3,857	550	14.3	10.4	1.5
35-44	2,880	509	17.7	7.9	1.4
45-54	3,384	856	25.3	9.3	2.3
55-64	2,599	689	26.5	9.2	2.4
65+	3,682	1,220	33.1	12.2	4.0
Total	**22,117**	**4,637**	**21.0**	**8.5**	**1.8**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Age specific rates per 100,000 using California Population data (CDoF- CDPH-EPI Center)

Among non-fatal traffic injuries shown in Table 4, the 15-24 age group had the highest rates for both total crash (1053.1) and pedestrian (52.3) injuries. The average age of the pedestrians injured in traffic crashes was 41.

Table 4: Total Non-Fatal Traffic and Pedestrians Injuries, by Age Group, 2007-2013

Age group (years)	Total Non-Fatal Injuries number	Pedestrian Non-Fatal Injuries number	Percent of Total Non-Fatal Injuries	Total Non-Fatal Injury Rate*	Pedestrian Non-Fatal Injury Rate*
0-14	119,344	16,856	14.1	222.4	31.4
15-24	410,919	20,358	5.0	1053.1	52.3
25-34	312,604	12,101	3.9	839.6	32.5
35-44	247,696	10,349	4.2	676.7	28.2
45-54	242,194	12,144	5.0	663.9	33.3
55-64	161,802	9,381	5.8	572.6	33.2
65+	151,406	9,932	6.6	503.7	32.8
Total	**1,645,965**	**91,121**	**5.5**	**629.9**	**34.8**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Age specific rates per 100,000 using California Population data (CDoF- CDPH-EPI Center)

Gender

Table 5 displays the number and rate of pedestrians killed by gender and age group. More than two-thirds (68 percent, 3,148 out of 4,637) of pedestrian fatalities in traffic crashes were males with a fatality rate of 2.4 per 100,000 male California residents. This is more than double the rate for females (1.1). For both males and females, the total fatality rates were highest among the 45 and older age groups. The total fatality rate for pedestrians 65 and older was 4.0.

Table 5: Pedestrians Fatalities in Traffic Crashes and Fatality Rates, by Age and Gender, 2007-2013

Age group (years)	Total Fatal Injuries number	Total Fatal Injuries Rate	Male-Fatal Injuries number	Male-Fatal Injury Rate*	Female-Fatal Injury number	Female-Fatal Injury Rate*
0-14	249	0.5	159	0.6	89	0.3
15-24	564	1.5	407	2.0	157	0.8
25-34	550	1.5	406	2.1	143	0.8
35-44	509	1.4	359	1.9	148	0.8
45-54	856	2.3	606	3.3	247	1.3
55-64	689	2.4	474	3.5	210	1.4
65+	1,220	4.0	737	5.6	474	2.8
Total	**4,637**	**1.8**	**3,148**	**2.4**	**1,468**	**1.1**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; * Total includes 21 unknown gender;**Age-specific rate per 100,000 using California Population data (CDoF- CDPH-EPI Center)

Table 6 contains the number of non-fatally injured pedestrians by gender and age group. The total male pedestrian injury rate was 37.0, which is 1.2 times higher than the female injury rate (29.0). Combing the fatal and non-fatal totals, the age groups with the highest pedestrian injury rates were the 15-24 and 65+ age groups (53.8, 36.9 per 100,000, respectively).

Table 6: Pedestrian Non-fatal Injuries in Traffic Crashes and Injury Rates by Age &Gender, 2007-2013

Age group (years)	Total Non-Fatal Injuries number	Total Non-Fatal Injuries Rate	Male-Non-Fatal Injuries number	Male-Non-Fatal Injury Rate*	Female-Non-Fatal Injury number	Female-Non-Fatal Injury Rate*
0-14	16,856	31.4	10,022	36.6	6,229	23.7
15-24	20,358	52.3	10,847	53.8	8,567	45.7
25-34	12,101	32.5	6,310	33.1	5,212	28.7
35-44	10,349	28.2	5,520	29.9	4,335	23.8
45-54	12,144	33.3	6,383	35.2	5,164	28.1
55-64	9,381	33.2	4,686	34.3	4,237	29.0
65+	9,932	32.8	4,932	37.4	4,420	25.9
Total	**91,121**	**34.8**	**48,700**	**37.4**	**38,164**	**29.0**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Total includes 4,257 unknown gender;**Age-specific rate per 100,000 using California Population data (CDoF- CDPH-EPI Center)

Alcohol Involvement

Alcohol involvement is defined in SWITRS as at least one driver or non-occupant (pedestrian) involved in the crash had consumed alcohol.[6] Indication of alcohol involvement does not indicate that a crash or fatality was caused by the presence of alcohol.[7]

Tables 7A and 7B provide data on alcohol involvement for traffic crashes and pedestrian fatalities by age groups. Alcohol involvement of the driver or non-occupant was observed in 33 percent of motor vehicle involved fatalities (7,386 out of 22,117 total fatalities) and 35 percent of pedestrian fatalities (1,624 out of 4,637) from 2007-2013. Total fatality rates with alcohol involvement were highest in 15 to 24 years age group (5.3). Pedestrians of 45 to 54 year age group who were in crashes where the driver or the pedestrian had alcohol involvement had the highest fatality rate (1.2) among all the age groups (Table 7B).

Table 7A: Alcohol Involvement in Fatal Traffic crashes by Age group, .2007-2013

Age group (years)	Alcohol not involved number	Alcohol not involved Rate*	Alcohol involved number	Alcohol involved Rate*
0-14	768	1.4	80	0.1
15-24	2,809	7.2	2,058	5.3
25-34	2,023	5.4	1,834	4.9
35-44	1,730	4.7	1,150	3.1
45-54	2,166	5.9	1,218	3.3
55-64	1,985	7.0	614	2.2
65+	3,250	10.7	432	1.4
Total	**14,731**	**5.6**	**7,386**	**2.8**

Table 7B: Alcohol Involvement in Fatal Pedestrian injuries by Age group, 2007-2013

Age group (years)	Alcohol not involved number	Alcohol not involved Rate*	Alcohol involved number	Alcohol involved Rate*
0-14	245	0.5	4	**N/A
15-24	312	0.8	252	0.6
25-34	266	0.7	284	0.8
35-44	274	0.7	235	0.6
45-54	432	1.2	424	1.2
55-64	455	1.6	234	0.8
65+	1,029	3.4	191	0.6
Total	**3,013**	**1.2**	**1,624**	**0.6**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; **Total # is <20, thus rates were not computed; *Age-specific rate per 100,000 using California Population data (CDoF- CDPH-EPI Center)

Tables 8A and 8B provide crash data on alcohol involvement in non-fatal traffic crashes and pedestrian injuries by age groups. Data are stratified based on alcohol involvement of the driver or pedestrian.

Seven percent of the total traffic non-fatal (118,268 out of 1,645,965) and 8 percent of pedestrian non-fatal injuries (7,224 out of 91,121) were alcohol involved. Total traffic injury rates with alcohol involvement were highest in 15 to 24 and 25-34 year olds (109.3 and 83.6, respectively). Total non-fatal injury rates with no alcohol involvement were also highest in 15-24 and 25-34 year olds (947.2 and 755.2) (Table 8A). Pedestrian non-fatal injury rates were highest in 15 to 24 years with no alcohol involvement (48.4) and 45-54 years old adults with alcohol involvement (4.4) (Table 8B).

Table 8A: Alcohol Involvement in Non-Fatal Traffic crashes by Age group. 2007-2013

Age group (years)	Alcohol not involved number	Alcohol not involved Rate*	Alcohol involved number	Alcohol involved Rate*
0-14	116,536	217.2	2,808	5.2
15-24	368,420	947.2	42,499	109.3
25-34	281,446	755.5	31,158	83.6
35-44	230,543	628.7	17,153	46.8
45-54	228,037	624.4	14,157	38.8
55-64	155,272	549.0	6,530	23.1
65+	147,443	487.2	3,963	13.1
Total	**1,527,697**	**584.1**	**118,268**	**45.2**

Table 8B: Alcohol Involvement in Non-Fatal Pedestrian injuries by Age group, 2007-2013

Age group (years)	Alcohol not Involved number	Alcohol not involved Rate*	Alcohol involved number	Alcohol involved Rate*
0-14	16,752	31.2	104	0.2
15-24	18,840	48.4	1,518	3.9
25-34	10,603	28.5	1,498	4.0
35-44	9,035	24.6	1,314	3.6
45-54	10,544	28.9	1,600	4.4
55-64	8,573	30.3	808	2.9
65+	9,550	31.6	382	1.3
Total	**83,897**	**32.1**	**7,224**	**2.8**

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; *Age specific rate per 100,000 using California Population data (CDoF-CDPH-EPI Center)

Fatal Injuries by County

Table 9 presents for each county the total traffic fatalities, pedestrian fatalities, percentage of pedestrian fatalities of total fatalities, proportion of pedestrian fatalities per 100,000 population and rank based on fatality rate. As indicated by the ranking, the highest pedestrian fatality rates were in Kern County (2.9) and Humboldt County (2.7). Fifteen counties have rates higher than the state average of 1.8. The individual county percentages of pedestrian fatalities by total traffic fatalities ranged from a low of 11 percent (Imperial) to a high of 52 percent (San Francisco) compared to the state average of 21 percent.

Table 9: Motor Vehicle and Pedestrian Traffic Crash Fatalities, Numbers, Rates and Rankings, by County, 2007- 2013

County*	Total Traffic Fatalities number	Pedestrian Fatalities number	Percent of Total Traffic Fatalities	Pedestrian Fatality Rate**	Pedestrian Fatality Rate Rank
Kern	903	157	17.4	2.9	1
Humboldt	177	25	14.1	2.7	2
Madera	215	26	12.1	2.5	3
Merced	327	41	12.5	2.4	4
Butte	200	38	19	2.4	5
Shasta	164	29	17.7	2.4	6
Tulare	490	65	13.3	2.3	7
San Bernardino	1,849	307	16.6	2.2	8
Fresno	887	147	16.6	2.2	9
San Francisco	257	134	52.1	2.2	10
Sacramento	808	213	26.4	2.2	11
Imperial	222	25	11.3	2.1	12
Los Angeles	4,431	1382	31.2	2.0	13
San Joaquin	584	94	16.1	2.0	14
Stanislaus	396	69	17.4	1.9	15
Riverside	1,636	267	16.3	1.8	16
San Diego	1,606	384	23.9	1.7	17
Santa Barbara	249	52	20.9	1.7	18
Monterey	277	43	15.5	1.5	19
Santa Clara	655	179	27.3	1.4	20
Alameda	551	147	26.7	1.4	21
Solano	231	41	17.7	1.4	22
Orange	1,093	287	26.3	1.3	23
Sonoma	264	45	17	1.2	24
Placer	176	28	15.9	1.2	25
San Mateo	266	63	23.7	1.1	26
Contra Costa	404	87	21.5	1.1	27
Ventura	441	60	13.6	1.0	28

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; * Thirty counties had less than 20 fatalities, and thus were excluded from the list; **Pedestrian fatality rate (Age adjusted rates per 100,000 using California Population data (CDoF- CDPH-EPI Center) and Year 2000 US Standard Population Weights) is a seven year cumulative rate for fatalities.

Non-Fatal Injuries by County

For each county, Table 10 presents the total traffic injuries (non-fatal), pedestrian injuries (non-fatal), percentage of pedestrian injuries of total injuries (non-fatal), and proportion of non-fatal pedestrian injuries per 100,000 population and rank based on non-fatal injury rates.

The highest county pedestrian injury rate was in San Francisco (94.2), followed by Los Angeles (51.3) and Alameda (42.9). Five counties have non-fatal injury rates higher than the state average of 34.5. The individual county percentages of pedestrian injuries by total traffic injuries ranged from a low of 1.4 percent (Amador and Calaveras) to a high of 18 percent (San Francisco County) compared to the state average of 5.5 percent.

Table 10: Non-Fatal Motor Vehicle and Pedestrian Traffic Crash Injuries, Numbers, Rates and Rankings by County, 2007-2013 (continued on to page 11)

County*	Total Non-Fatal Traffic Injuries number	Pedestrian Non-Fatal Injuries number	Percent of Total Traffic Non-Fatal Injuries	Pedestrian Non-Fatal Injury Rate**	Pedestrian Non-Fatal Injury Rate Rank
San Francisco	31,494	5,536	17.6	94.2	1
Los Angeles	519,976	35,653	6.9	51.3	2
Alameda	61,725	4,574	7.4	42.9	3
Humboldt	6,437	356	5.5	37.7	4
Santa Barbara	18,217	1,104	6.1	37.2	5
San Mateo	23,561	1,672	7.1	33.7	6
Santa Cruz	10,497	629	6.0	33.0	7
San Diego	129,227	7,251	5.6	32.9	8
Marin	9,427	539	5.7	32.3	9
Stanislaus	25,290	1,126	4.5	30.5	10
Sacramento	72,644	3,035	4.2	30.2	11
Monterey	14,170	859	6.1	29.3	12
Santa Clara	63,221	3,496	5.5	28.3	13
Orange	135,950	5,849	4.3	27.6	14
San Joaquin	32,367	1,299	4.0	26.7	15
Tuolumne	3,123	98	3.1	26.5	16
Kern	34,255	1,576	4.6	25.9	17
Solano	16,814	754	4.5	25.9	18
Ventura	35,009	1,484	4.2	25.6	19
Del Norte	1,459	47	3.2	25.2	20
Sonoma	20,093	843	4.2	25.1	21
Merced	11,825	448	3.8	24.6	22
Sutter	4,485	166	3.7	24.5	23
Mono	828	24	2.9	23.4	24
Napa	6,751	222	3.3	23.4	25
Contra Costa	31,334	1,671	5.3	23.0	26

County*	Total Non-Fatal Traffic Injuries number	Pedestrian Non-Fatal Injuries number	Percent of Total Traffic Non-Fatal Injuries	Pedestrian Non-Fatal Injury Rate**	Pedestrian Non-Fatal Injury Rate Rank
Tulare	18,091	701	3.9	22.3	27
Mendocino	4,217	132	3.1	22.3	28
San Luis Obispo	10,099	423	4.2	22.1	29
Nevada	3,999	134	3.4	21.9	30
Butte	8,165	339	4.2	21.1	31
Shasta	8,539	254	3.0	21.0	32
Kings	5,814	229	3.9	20.9	33
San Bernardino	86,563	3,062	3.5	20.7	34
Yuba	2,555	109	4.3	20.7	35
San Benito	2,187	80	3.7	19.9	36
Tehama	2,819	86	3.1	19.9	37
Lake	2,808	82	2.9	19.8	38
Inyo	1,268	26	2.1	19.1	39
Madera	6,812	196	2.9	18.3	40
Yolo	7,232	268	3.7	17.8	41
Fresno	33,002	1,171	3.5	16.9	42
Colusa	1,295	26	2.0	16.8	43
Riverside	82,601	2,613	3.2	16.7	44
Glenn	1,151	30	2.6	15.8	45
Imperial	5,458	196	3.6	15.8	46
Siskiyou	2,042	43	2.1	14.7	47
Amador	2,305	33	1.4	13.5	48
Calaveras	2,360	34	1.4	13.2	49
Placer	12,627	306	2.4	13.1	50
El Dorado	6,721	159	2.4	13.0	51
Lassen	1,291	27	2.1	11.0	52

Source: CDPH ISES/SACB SWITRS data sets 2007-2013; * Six Counties had less than 20 non-fatal injuries, and thus were excluded from the list; ** Pedestrian injury rate (Age adjusted rates per 100,000 using California Population data (CDoF- CDPH-EPI Center) and Year 2000 US Standard Population Weights) is a seven year cumulative rate for non-fatal injuries.

Summary

Data from the CHP-SWITRS are used to provide a broad overview of both fatal and non-fatal traffic related injuries among pedestrians in California from 2007 to 2013. There were a total of about 1.7 million fatal and non-fatal traffic injuries during the study period. Pedestrian traffic injuries comprised 5.7 percent (n=95,758) of the total traffic injuries, of which 95 percent were non-fatal and 5 percent were fatal injuries. Pedestrian fatality rates increased by 11 percent from 1.8 in 2007 to 2.0 in 2013, while the non-fatal pedestrian injury rates decreased by 13.5 percent from a high of 39 per 100,000 to 32 per 100,000 during the same time period.

This report provides a detailed look at multiple characteristics and circumstances surrounding motor-vehicle related fatal and non-fatal pedestrian injuries. Data are presented on environmental characteristics, age groups, gender, alcohol involvement in pedestrian injuries, and include breakdowns by county numbers, rates, and rankings. The vast majority of fatal and non-fatal pedestrian injuries occurred in urban areas compared to rural areas; thus the rates were lower in rural areas. In contrast, the rates for total traffic injuries were higher in rural areas than urban areas. Non-intersection locations accounted for 64 percent of pedestrian injuries and 62 percent occurred during day light hours. Alcohol was involved (driver or pedestrian) in seven percent of the total traffic and 8 percent of pedestrian non-fatal injuries. The age groups with the highest pedestrian injury rates were the 15-24 and 65+ age groups. There was wide variation in the pedestrian injury and fatality rates across counties. For instance, San Francisco County ranked No. 1 for rate of non-fatal pedestrian injuries and No. 10 for rate of pedestrian fatalities. Similarly, Kern County ranked No. 1 for pedestrian fatalities and No. 17 for non-fatal pedestrian injuries.

These summary findings are intended to provide practical information for identifying potential areas for pedestrian safety improvements. With the high numbers of pedestrian injuries overall and the increasing fatality rates in California, this report highlights the importance of addressing pedestrian traffic safety and may serve as guidance for counties in formulating policy decisions aimed at decreasing pedestrian injuries and improving traffic safety. Some of the suggested evidence-based practices for pedestrian traffic safety that may mitigate pedestrian exposure to vehicle traffic include engineering, education, and enforcement approaches. Road treatments that separate pedestrians from traffic flow and reduce vehicle speeds have a direct impact on the likelihood of fatality for pedestrians and motor-vehicle drivers in general[8] (e.g., sidewalks, in-street pedestrian crossing signs, high-visibility cross walk signs with advance yield markings). Education strategies for both pedestrians and drivers on pedestrian awareness include using sidewalks when available, staying alert (e.g., not under the influence or distracted), being visible (e.g., wearing bright color clothing or reflective material), and crossing streets at crosswalks or intersections, when possible.

Methods

Data Sources

The California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) data sets from 2007 to 2013 were used for the analyses presented in this report.

Definitions

A *pedestrian* is any person walking, or in/on a pedestrian conveyance such as roller blades, a baby stroller or a wheelchair. Pedestrian injuries included in this report are those where a pedestrian is struck by a motor vehicle. Collision records indicating a pedestrian victim were obtained from SWITRS data.

Limitations

Data for the seven years (2007 to 2013) were combined due to low numbers in some counties. Thus it is possible that some of the effects in a given year, county or demographic, etc. may be masked due to this aggregation. Population rates and confidence intervals have been presented to alleviate some of these issues. Pedestrian injury rates are calculated based on the number of injuries divided by the overall state or county population which doesn't take into account the actual exposure of pedestrians to traffic (i.e., how many and for how often/long pedestrians are in or near traffic areas). This limitation is due to the lack of reliable or generalizable measures of pedestrian behavior and may mask important differences in exposure across many traffic situations. Therefore, it is suggested that sufficient caution be paid during interpretation of the data.

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[5] The total number of pedestrian injuries presented here may differ from those of Center for Health Statistics and Informatics (death data) and the Office of Statewide Health Planning & Development (Inpatient Hospitalization and Emergency Department data) due to the inherent procedures as to how the data was acquired and processed.

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