

Traffic Safety Facts

Research Note

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Comparison of Crash Fatalities by Sex and Age Group

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Summary

The purpose of this research note is to explore the ratio and distribution pattern of motor vehicle crash fatalities by sex and age from 1996 to 2006. Following are the major findings of the analysis:

- Motor vehicle crash fatalities were higher for males than females in all age groups, while the male population is equal to or less than the female population in all age groups.
- Compared to all age groups and both sexes, fatality rates increased only among males in the age groups 41 to 45, 46 to 50, and 51 to 55.
- Among both genders, the age group under 16 steadily declined not only in fatalities but also in fatality rate, whereas the 51-to-55 age group had the highest increase in fatalities.
- Among females, the over-65 age group had the highest number of fatalities followed by the 16-to-20 age group.
- Among males, the age groups 16 to 20, 21 to 25, and over 65 had more crash fatalities than other age

groups. The 46-to-50 age group had the greatest increase in fatality rate.

Methods

Data for 1996 to 2006 has been used in this research note. The population data is from the Census Bureau, while the number of motor vehicle crash fatalities is from the Fatality Analysis Reporting System (FARS).

Ages were divided into 12 groups for data distribution and comparison. They are under 16, 16 to 20, 21 to 25, 26 to 30, 31 to 35, 36 to 40, 41 to 45, 46 to 50, 51 to 55, 56 to 60, 61 to 65, and over 65.

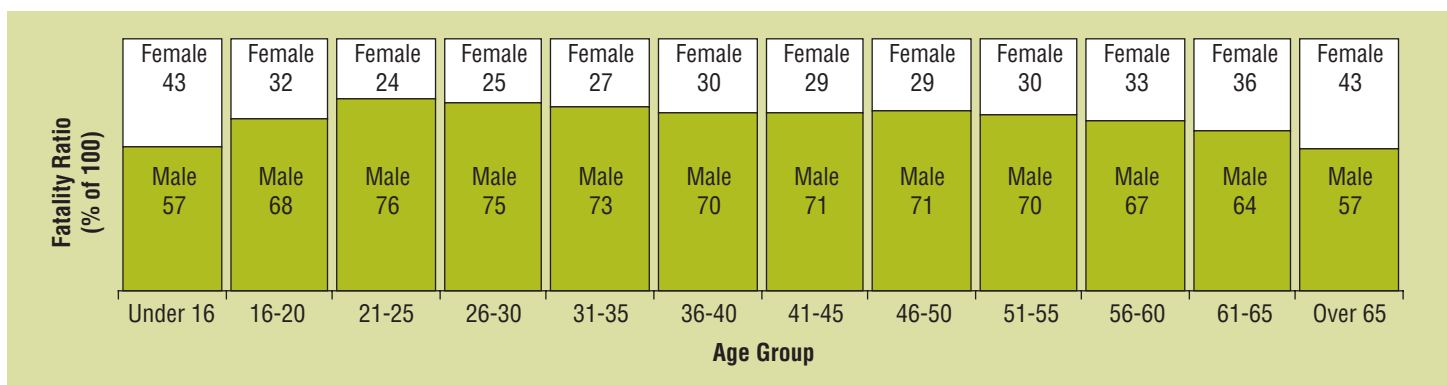
In order to get the average changes over the 11-year period, the geometric mean is used in this study. Those average changes per year in fatalities, population, and fatality rate are displayed in the last column of Tables 1, 2, and 3, respectively, in the appendix.

Data Analysis

Fatality Ratio Among Sex and Age

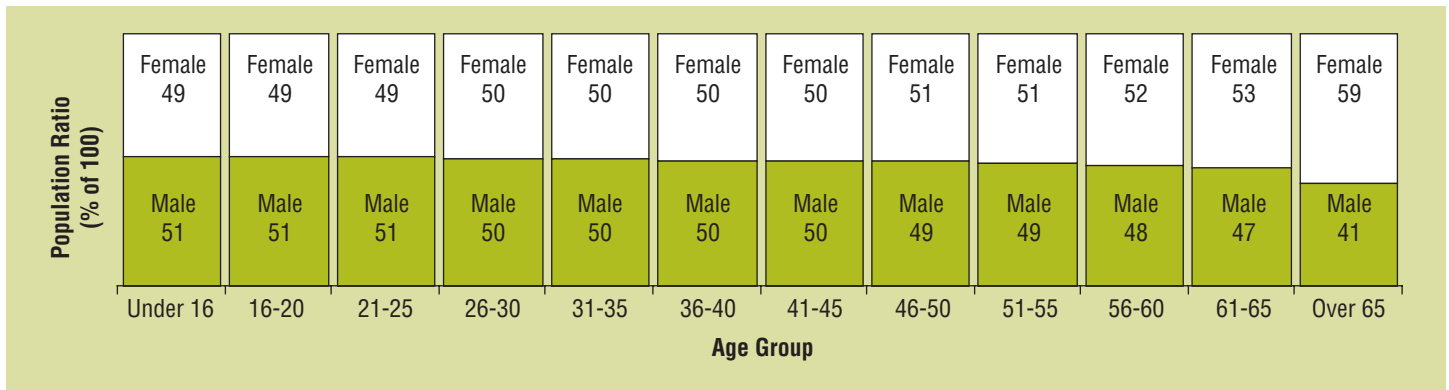
Figure 1 summarizes the data from Table 1 in the appendix for presenting the distribution of total crash

Figure 1: Distribution of Total Crash Fatalities by Sex and Age Group



Data Source: FARS 1996-2005 (Final), 2006 (ARF)

Figure 2: Distribution of Average Population by Sex and Age Group



Data Source: U.S. Census Bureau

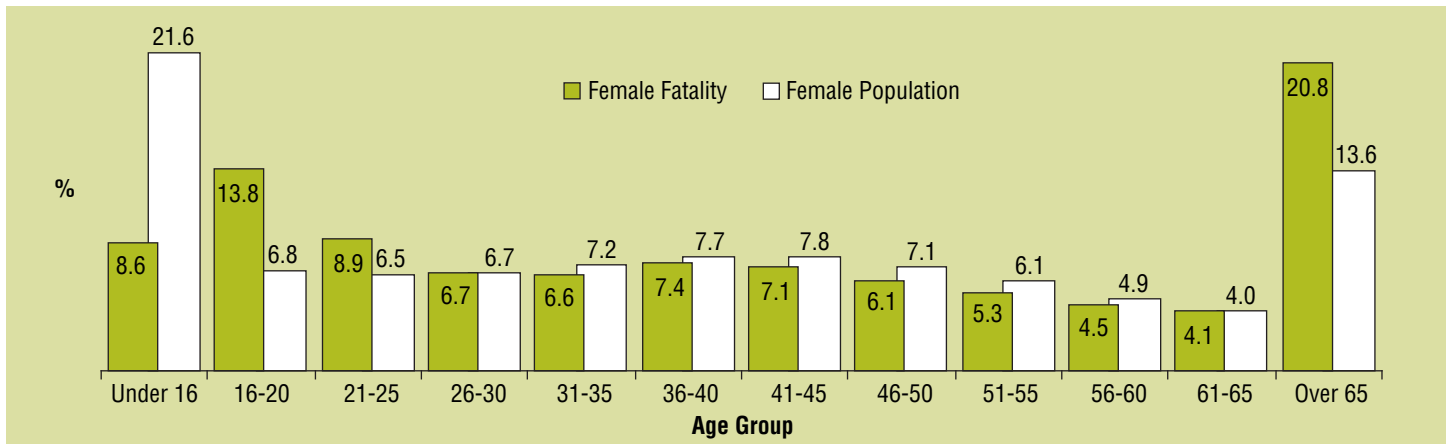
fatalities by sex for each specific age group. The data in Table 2 in the appendix has been used to create the distribution of average population by sex for each specific age group as shown in Figure 2.

Among the over-65 age group, mean population was 41 percent for males and 59 percent for females from 1996 through 2006. However, the fatalities were 57 percent

for males and 43 percent for females during the same time period indicating an over-representation of males in crash fatalities.

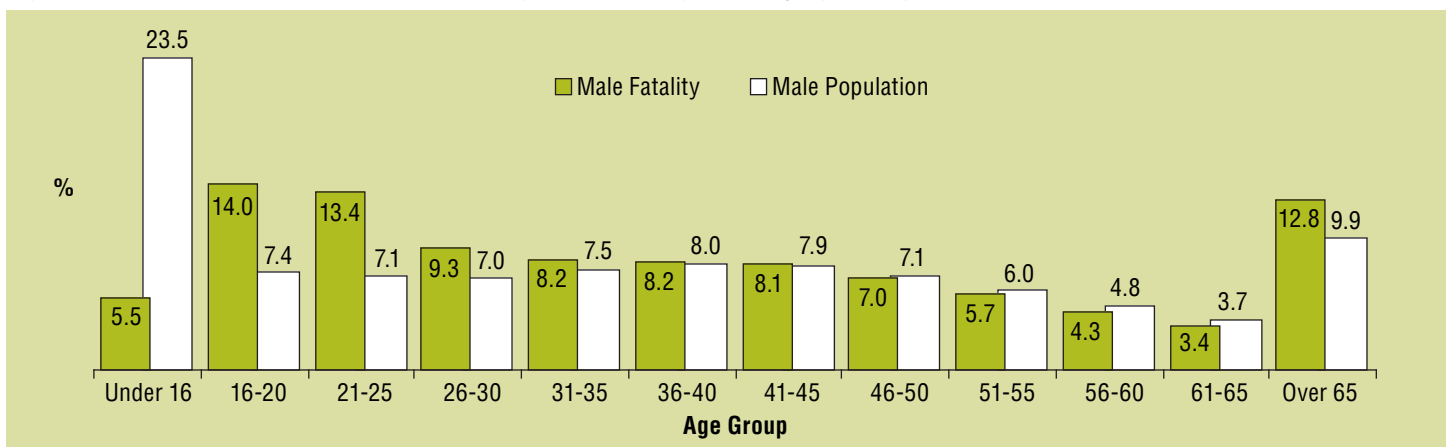
Although mean population was 51 percent or less for males in the rest of the age groups, males made up 75 percent or more of fatalities among the 21-to-25 and 26-to-30 age groups. In addition, males made up 57 percent

Figure 3: Distribution of Fatalities and Mean Population Among Females by Age Group



Data Source: U.S. Census Bureau and FARS 1996-2005 (Final), 2006 (ARF)

Figure 4: Distribution of Fatalities and Mean Population Among Males by Age Group



Data Source: U.S. Census Bureau and FARS 1996-2005 (Final), 2006 (ARF)

and females made up 43 percent of fatalities among the under-16 age group and the over-65 age group. In the rest of the age groups, the motor vehicle crash fatalities were nearly 70 percent for males but only 30 percent for females.

Figures 3 and 4 show the distribution of mean population and crash fatalities from 1996 to 2006 by age group for females and males, respectively.

As Figures 3 and 4 point out, the fatality percentage for the over-65 age group was nearly 21 percent among females and 13 percent among males. Over this time period, female accounted for 13.6 percent of female population and male accounted for near 10 percent of male population.

The 16-to-20 age group accounted for 14 percent of fatalities among females and males. The fatality percentage for ages 21 to 25 was 13 percent among males but only 9 percent among females. The fatalities for the under-16 age group made up 9 percent among females but only 5 percent among males. The rest of the age groups, female or male, comprised 8 percent or fewer fatalities.

Figures 3 and 4 also show that the population for the under-16 age group was close to 24 percent among males and nearly 22 percent among females, but the crash fatalities for the same age group were only 5 percent among males and 9 percent among females. The 16-to-20 age group accounted for only 7 percent of the population but 14 percent of fatalities among males and females. Likewise, the over-65 age group made up 21 percent of crash fatalities among females, yet this age group only accounted for 14 percent of the female population.

Moreover, males age 21 to 25 are overrepresented in fatalities (13.4%) compared with average percentage of male population (7.1%).

Fatality Changes Among Sex and Age

Data in Table 1 in the appendix is plotted in Figure 5 to emphasize which age group had the largest change in crash fatalities. The figure shows that males in the 51-to-55 age group had the highest average crash fatality increase (continuous 11 years up by 5.3% per year) followed by males in the 56-to-60 age group (continuous 11 years up by 4.5% per year).

It also shows that males in the under-16 age group had the highest average fatality reduction (continuous 11 years down by approximately 5% per year), followed by the similar age group of females (continuous 11 years down by 3.5% per year). The average change per year in total fatalities among females decreased 0.9 percent while total fatalities among males increased 0.6 percent.

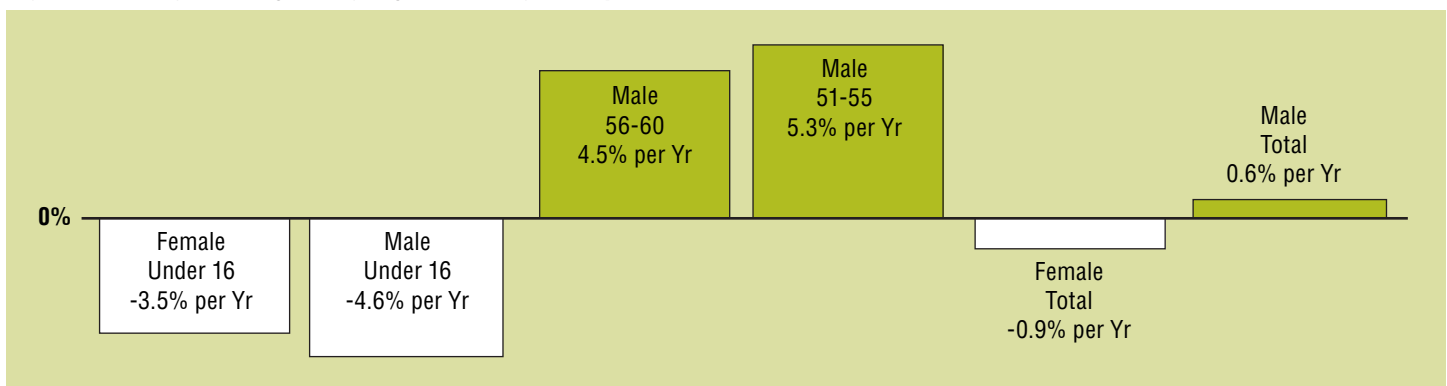
The largest increase in fatalities among both sexes in all age groups was among males 51 to 55, by 67 percent during the 11 years studied, from 1,193 in 1996 to 1,995 in 2006. During the same time interval, male population for that age group increased less than 49 percent.

Data in Table 2 in the appendix reveals that 20 out of 24 age/gender groups showed population growth, except the 31-to-40 age groups among both females and males. The 56-to-60 age group had the largest population increase. Its 11-year continuous population growth per year was 4.7 percent among males and 4.4 percent among females.

Further, data in Table 3 in the appendix indicates that males in the 16-to-20 and 21-to-25 age groups had the highest fatality rates (average 39 per 100,000 males), and females in the under-16 age group had the lowest fatality rate (nearly 4 per 100,000 females on average) across all sex and age groups.

Table 3 in the appendix also shows that the under-16-year-olds had the lowest fatality rate among females

Figure 5: Average Fatality Change by Sex and Age Group



Data Source: FARS 1996-2005 (Final), 2006 (ARF)

and males. These groups also declined quickly in their crash fatality rates. Their 11-year continued decrease per year was 4.1 percent for females and 5.1 percent for males. The male fatality rates among the 46-to-50 and 51-to-55 age groups had the largest increases among all groups. They increased by 1.5 percent and 1.7 percent per year, respectively, for 11 years studied.

Findings

Data analysis in the last section found the motor vehicle crash fatalities were higher for males than females in all age groups, while the male population is equal to or less than the female population in all age groups from 1996 to 2006. Over the past 11 years, fatality rates increased only among males in three age groups; 41 to 45, 46 to

50, and 51 to 55, when compared to all age groups and both sexes.

The result of 11-year data analysis also indicated the age group under 16 steadily declined not only in fatalities but also in fatality rate, whereas the 51-to-55 age group had the highest increase in fatalities among both genders. The over-65 age group had the highest number of fatalities followed by the 16-to-20 age group among females.

In addition, the 46-to-50 age group among males had the greatest increase in fatality rate. Three age groups, 16 to 20, 21 to 25, and over 65, had more crash fatalities than other age groups among males.

Appendix

Table 1: Distribution of Total Crash Fatalities by Sex, Age Group, and Year

Sex & Age Group	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average % Change per Year
Female Under 16	1,380	1,365	1,258	1,234	1,223	1,094	1,065	1,071	1,142	1,017	964	-3.5
Female 16-20	1,810	1,877	1,825	1,934	1,816	1,859	1,963	1,921	1,899	1,786	1,755	-0.3
Female 21-25	1,249	1,176	1,072	1,135	1,186	1,150	1,244	1,250	1,252	1,293	1,251	0.0
Female 26-30	1,063	990	928	913	892	841	828	846	879	844	868	-2.0
Female 31-35	1,058	1,041	973	903	866	832	833	813	840	824	788	-2.9
Female 36-40	1,057	1,057	1,111	1,068	1,019	1,063	996	975	856	870	857	-2.1
Female 41-45	877	892	950	938	951	935	1,055	996	959	1,006	983	1.1
Female 46-50	743	767	829	777	812	764	851	857	880	867	867	1.6
Female 51-55	596	634	649	682	669	734	780	784	777	805	762	2.5
Female 56-60	534	619	584	581	604	588	575	635	632	685	691	2.6
Female 61-65	589	562	543	562	519	492	581	555	606	578	538	-0.9
Female Over 65	3,006	3,159	3,141	2,920	2,806	2,822	2,731	2,809	2,636	2,553	2,399	-2.2
Female Total*	13,991	14,168	13,885	13,667	13,396	13,205	13,529	13,532	13,387	13,155	12,747	-0.9
Male Under 16	1,924	1,802	1,736	1,708	1,608	1,509	1,483	1,508	1,480	1,340	1,206	-4.6
Male 16-20	3,994	3,915	3,904	3,985	4,149	4,204	4,336	4,109	4,024	3,933	3,883	-0.3
Male 21-25	3,853	3,528	3,470	3,505	3,622	3,892	3,998	3,941	4,105	4,254	4,419	1.4
Male 26-30	2,664	2,705	2,553	2,644	2,723	2,685	2,683	2,549	2,622	2,786	2,780	0.4
Male 31-35	2,594	2,461	2,421	2,281	2,308	2,329	2,328	2,335	2,290	2,420	2,379	-0.9
Male 36-40	2,396	2,362	2,380	2,433	2,464	2,432	2,440	2,298	2,224	2,286	2,158	-1.0
Male 41-45	2,045	2,028	2,086	2,231	2,381	2,444	2,416	2,572	2,467	2,493	2,387	1.6
Male 46-50	1,600	1,713	1,790	1,837	1,934	1,976	2,119	2,166	2,275	2,329	2,386	4.1
Male 51-55	1,193	1,368	1,401	1,432	1,549	1,634	1,715	1,821	1,835	2,035	1,995	5.3
Male 56-60	1,009	1,044	1,046	1,142	1,198	1,213	1,217	1,393	1,436	1,537	1,564	4.5
Male 61-65	898	878	891	855	895	915	987	1,006	1,027	1,170	1,144	2.5
Male Over 65	3,806	3,948	3,862	3,923	3,630	3,671	3,654	3,582	3,577	3,674	3,315	-1.4
Male Total*	28,061	27,827	27,608	28,040	28,545	28,986	29,466	29,346	29,443	30,347	29,722	0.6

Source: FARS 1996-2005 (Final), 2006 (ARF)

* Includes unknown age

Table 2: Distribution of U.S Population (thousands) by Sex, Age Group, and Year

Sex & Age Group	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average % Change per Year
Female Under 16	30,031	30,183	30,290	30,393	31,393	31,506	31,594	31,682	31,758	31,808	31,785	0.6
Female 16-20	8,984	9,236	9,446	9,638	9,874	9,904	9,918	9,948	10,020	10,150	10,312	1.4
Female 21-25	8,795	8,572	8,550	8,622	9,188	9,452	9,776	9,997	10,171	10,258	10,282	1.6
Female 26-30	9,554	9,595	9,543	9,433	9,823	9,643	9,441	9,396	9,469	9,656	9,901	0.4
Female 31-35	11,021	10,785	10,507	10,230	10,294	10,269	10,363	10,386	10,329	10,193	9,999	-1.0
Female 36-40	11,254	11,385	11,422	11,418	11,498	11,401	11,194	10,959	10,721	10,521	10,486	-0.7
Female 41-45	10,220	10,497	10,773	11,018	11,189	11,371	11,528	11,568	11,585	11,608	11,505	1.2
Female 46-50	8,918	9,391	9,416	9,613	10,012	10,267	10,510	10,793	11,029	11,201	11,377	2.5
Female 51-55	6,960	7,114	7,713	8,006	8,606	9,055	9,511	9,530	9,708	9,940	10,190	3.9
Female 56-60	5,759	5,905	6,110	6,443	6,759	6,973	7,160	7,738	8,060	8,449	8,890	4.4
Female 61-65	5,292	5,263	5,289	5,389	5,560	5,647	5,775	5,980	6,292	6,540	6,748	2.5
Female Over 65	18,935	19,075	19,158	19,209	19,538	19,659	19,765	19,880	20,030	20,209	20,412	0.8
Female Total	135,724	137,001	138,218	139,414	143,735	145,147	146,534	147,858	149,171	150,534	151,886	1.1
Male Under 16	31,504	31,655	31,763	31,864	32,954	33,050	33,128	33,217	33,290	33,334	33,298	0.6
Male 16-20	9,496	9,763	9,984	10,187	10,433	10,501	10,542	10,545	10,595	10,713	10,878	1.4
Male 21-25	9,013	8,797	8,782	8,874	9,594	9,900	10,247	10,477	10,740	10,886	10,967	2
Male 26-30	9,473	9,481	9,411	9,286	10,037	9,874	9,710	9,684	9,818	10,047	10,328	0.9
Male 31-35	10,900	10,649	10,349	10,059	10,395	10,407	10,504	10,534	10,500	10,379	10,206	-0.7
Male 36-40	11,122	11,261	11,302	11,298	11,414	11,335	11,161	10,936	10,747	10,584	10,585	-0.5
Male 41-45	9,969	10,248	10,540	10,803	10,975	11,173	11,334	11,385	11,408	11,447	11,367	1.3
Male 46-50	8,564	9,018	9,033	9,227	9,674	9,934	10,177	10,452	10,703	10,885	11,076	2.6
Male 51-55	6,544	6,684	7,265	7,541	8,223	8,658	9,088	9,098	9,264	9,486	9,741	4.1
Male 56-60	5,268	5,406	5,598	5,914	6,285	6,495	6,679	7,245	7,558	7,930	8,353	4.7
Male 61-65	4,672	4,661	4,701	4,802	4,997	5,085	5,205	5,393	5,686	5,913	6,115	2.7
Male Over 65	12,978	13,160	13,302	13,421	13,502	13,668	13,816	13,969	14,157	14,369	14,600	1.2
Male Total	129,504	130,783	132,030	133,277	138,482	140,079	141,592	142,938	144,467	145,974	147,512	1.3

Source: Census Bureau

Table 3: Distribution of Fatality Rate* by Sex, Age Group, and Year

Sex & Age Group	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average % Change per Year
Female Under 16	4.6	4.5	4.2	4.1	3.9	3.5	3.4	3.4	3.6	3.2	3.0	-4.1
Female 16-20	20.1	20.4	19.4	20.2	18.3	18.8	19.8	19.4	19.0	17.7	17.0	-1.6
Female 21-25	14.2	13.7	12.6	13.2	12.9	12.1	12.7	12.5	12.3	12.6	12.2	-1.5
Female 26-30	11.1	10.3	9.8	9.7	9.1	8.8	8.8	9.0	9.3	8.7	8.8	-2.3
Female 31-35	9.6	9.6	9.3	8.9	8.4	8.1	8.0	7.8	8.2	8.1	7.9	-2.0
Female 36-40	9.4	9.3	9.8	9.4	8.9	9.3	8.9	8.9	8.0	8.3	8.2	-1.4
Female 41-45	8.6	8.5	8.8	8.5	8.5	8.2	9.2	8.6	8.3	8.7	8.6	0.0
Female 46-50	8.4	8.2	8.8	8.1	8.1	7.4	8.1	7.9	8.0	7.7	7.6	-0.9
Female 51-55	8.5	8.9	8.4	8.5	7.8	8.1	8.2	8.3	8.0	8.1	7.5	-1.3
Female 56-60	9.2	10.5	9.6	9.1	8.9	8.4	8.0	8.3	7.8	8.2	7.8	-1.7
Female 61-65	11.1	10.6	10.3	10.4	9.3	8.8	10.0	9.3	9.6	8.9	8.0	-3.2
Female Over 65	15.9	16.5	16.4	15.2	14.4	14.3	13.8	14.1	13.2	12.6	11.8	-3.0
Female Total	10.3	10.3	10.1	9.8	9.3	9.1	9.2	9.2	9.0	8.7	8.4	-2.0
Male Under 16	6.1	5.7	5.5	5.4	4.9	4.6	4.5	4.5	4.4	4.0	3.6	-5.1
Male 16-20	42.0	40.0	39.0	39.1	39.9	40.0	41.3	39.1	38.0	36.8	35.6	-1.6
Male 21-25	42.8	40.1	39.4	39.4	37.7	39.3	39.2	37.5	38.4	39.0	40.2	-0.6
Male 26-30	28.0	28.5	27.2	28.4	27.2	27.1	27.7	26.3	26.8	27.9	27.0	-0.4
Male 31-35	23.8	23.2	23.5	22.6	22.2	22.4	22.2	22.2	21.8	23.3	23.3	-0.2
Male 36-40	21.6	20.9	21.1	21.5	21.6	21.5	21.8	21.1	20.8	21.6	20.4	-0.6
Male 41-45	20.5	19.9	19.9	20.7	21.7	21.8	21.4	22.6	21.6	21.9	20.9	0.2
Male 46-50	18.6	19.0	19.9	20.0	19.9	20.0	20.8	20.6	21.3	21.4	21.5	1.5
Male 51-55	18.4	20.4	19.2	19.1	18.9	18.8	18.9	20.0	19.7	21.4	20.6	1.1
Male 56-60	19.0	19.3	18.7	19.4	19.0	18.7	18.2	19.4	18.9	19.5	18.6	-0.2
Male 61-65	19.1	18.7	19.0	17.8	17.9	17.9	19.0	18.6	18.0	19.8	18.8	-0.2
Male Over 65	29.3	29.9	29.0	29.3	26.9	26.8	26.5	25.6	25.2	25.5	22.7	-2.5
Male Total	21.7	21.3	20.9	21.0	20.6	20.7	20.8	20.5	20.4	20.8	20.2	-0.7

Source: FARS 1996-2005 (Final), 2006 (ARF); U.S. Census Bureau

* rate is per 100,000 (females or males)



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