Injuries and Poisonings

Injuries are described by two dimensions: the external cause (e.g., car crash) and the diagnosis (e.g., fracture).[1] Each dimension has two components—the external cause is categorized by the mechanism (e.g., firearm) and the intent (e.g., assault), and the diagnosis is categorized by the nature of the injury (e.g., open wound) and the body region of the injury (e.g., chest). In order to design effective prevention programs to reduce injuries or to lessen their severity, one must know the mechanism that caused the injury. Common examples of mechanisms include motor vehicles, firearms, and falls. The intent describes whether the mechanism was one of the following: unintentional (accident), self-inflicted with intent to harm oneself, homicide/assault, legal intervention/operations of war, or undetermined intent.

Finding the appropriate language to define or categorize the circumstances leading to injuries has posed problems for many in the injury prevention and control field. An example of this is that the classification, *accident,* may imply that an event could not be prevented. The word accident is used in the *International Classification of Diseases and Related Health Problems*, which is the international standard for defining causes of mortality and morbidity. Accidents are the fifth leading cause of death according to the official ranking by the National Center for Health Statistics (NCHS); however, in deference to often preferred terminology, NCHS has added "unintentional injuries" as a parenthetical phrase following "accidents" in its standard mortality publications.

The National Highway Traffic Safety Administration (NHTSA) prefers to use the term *crash* instead of accident. A crash is defined by NHTSA as "an event that produces injury and/or property damage, involves a motor vehicle in transport, and occurs on a traffic way or while the vehicle is still in motion after running off the traffic way". However, not all traffic-related events are crashes; some are rollovers or non-collisions (e.g., being thrown from a vehicle). The Bureau of Labor Statistics uses the word *incident*, as in "highway and non-highway incidents". In the *International Classification of External Causes of Injury*, the term *accidental* is an accepted synonym for unintentional.

National

In 2009, more than 177,157 deaths in the United States were injury related.[2] Injury, poisoning, and adverse effects of medical treatment accounted for 39.4 million emergency department visits. This equates to 33.7% of all visits and 13.3 visits per 100 persons.[3] Unintentional injuries accounted for two-thirds of the visits, intentional injuries accounted for 5%, adverse effects of medical treatment accounted for 4%, alcohol or drug abuse accounted for 4.5%, and the cause or intent of injury was unknown or undetermined accounted for 20%. The two leading injury mechanisms resulting in a high rate of initial emergency department visits by teens and young adults are motor vehicles and being struck by or against an object or person. Falls are the leading mechanism of injury for all other age groups. Among persons younger than 65 years old, males have higher hospitalization rates due to injury. Women older than 75 years of age have the highest hospitalization rates for injury of all age and sex groups, primarily because of hip fractures.

Nationally, 10.3% of medical expenditures are due to injuries, both intentional and unintentional.[4] Injury, death, and disability that occurred in 2000 were estimated to cost $80 billion in lifetime medical care treatment costs for physical injuries and another $326 billion in lifetime lost productivity, totaling more than $400 billion for the combined economic burden of medical treatment and lost productivity.

Approximately two-thirds of deaths from all injuries are unintentional.[5] Among persons aged 1-44 years, unintentional injuries are the leading cause of both death and potential years of life lost before age 65. A *Healthy People 2010* objective called for reducing the death rate caused by unintentional injuries to 17.5 per 100,000 population. In 2005, the na-

Table 15.1. Kansas City residents who sought medical care at an emergency department or hospital for selected injuries, Kansas City, MO, 2009

Injury caused by	Unintentional	Assault	Legal intervention	Self-inflicted	Unknown	Total
Abuse/neglect/rape	0	405	0	0	0	405
Cut/piercing	2948	307	2	106	13	3376
Drowning	9	0	0	0	0	9
Fall/jump	12005	4	0	3	2	12014
Fire/burn	768	6	0	2	5	781
Firearm	111	342	5	9	41	508
Machinery	121	0	0	0	0	121
Motor vehicle, traffic	5416	10	0	1	1	5428
Motor vehicle, non-traffic	686	0	0	0	0	686
Other transport	60	0	0	0	0	60
Weather/animals	2057	0	0	0	3	2060
Over exertion	4113	0	0	0	0	4113
Poison/overdose	695	3	1	578	139	1416
Struck by/against	5258	1936	6	0	0	7200
Suffocation/hanging	19	0	0	5	2	28
All other	4795	682	137	17	20	7482
Unknown	0	0	0	0	262	262
Total	**39061**	**3697**	**151**	**721**	**488**	**44118**

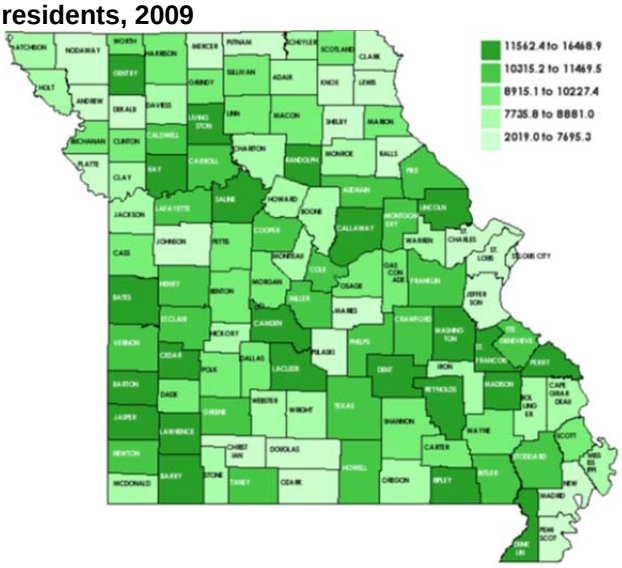
tional unintentional injury mortality rate was 39.0 per 100,000 population and had been increasing since 1999.[6]

About 50% of all injury episodes occur around the home and about 25% result from leisure activities. On average, since 2000, just over 5,000 deaths per year are due to injuries incurred on-the-job. In 2008, 5,214 workers died and 3.7 million individuals experienced nonfatal occupational injuries and illnesses (www.bls.gov). The occupational fatality rate in 2008 was 3.7 deaths per 100,000 full-time equivalent workers.

Kansas City

In 2009, Kansas City residents experienced 44,118 intentional and unintentional injuries for which they received emergency department treatment or hospitalization (Table 15.1). Of these injuries, 88.5% were considered unintentional, 8.4% were the result of assault, 1.6% were self-inflicted, 0.3% were the result of legal interventions, and the intent was unknown for 1.1%. Falls accounted for 27.2% of the injuries and was the leading category for injury, followed by being struck by a blunt object or person (16.3%), motor vehicle crashes (12.3%), over-exertion (9.3%), and cuttings and piercings (7.7%). The rates of unintentional injuries per 100,000 population for counties in Missouri are shown in Figure 15.1; the counties in which Kansas City is situated were in the middle and lower quintiles.

Figure 15.1. Unintentional injuries among Missouri residents, 2009



(source: Missouri Department of Health and Senior Services)

The rates for unintentional injury and assault deaths in Kansas City are shown in Figure 15.2, while Figure 15.3 displays the rates for emergency department visits and hospitalizations resulting from unintentional injuries.

Each year, 7-8 Kansas City residents die from injuries that were occupationally related. This death rate has remained constant over the past decade. According to the U.S. Department of Labor, 147 Missourians died in 2008 as the result of work-related injuries. Transportation incidents were the event or exposure in 39% of the fatalities followed by assaults/violence (23%), contact with objects/equipment (16%), falls (12%), exposure to harmful substances/environments (5%), and fires/explosions (3%).

Figure 15.2. Rates per 100,000 population from unintentional and assault injuries, Kansas City, MO, 2000-2009

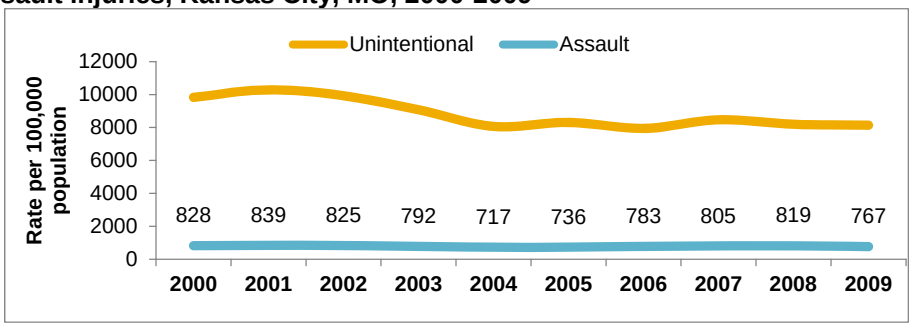
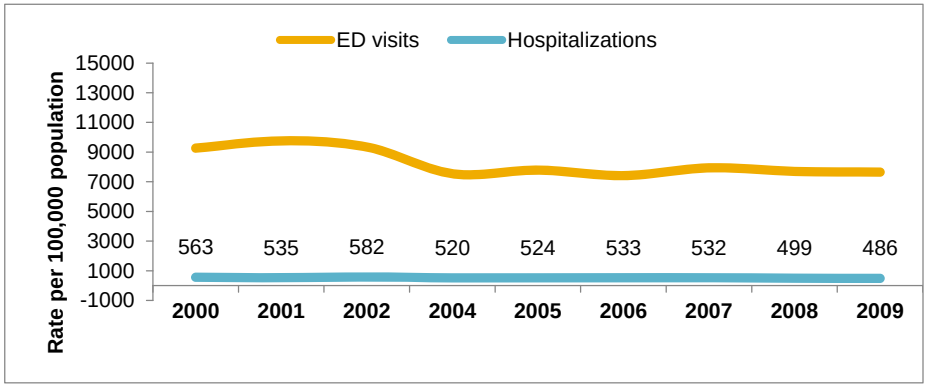


Figure 15.3. Rates for emergency department visits and hospitalizations per 100,000 population from unintentional injuries, Kansas City, MO, 2000-2009

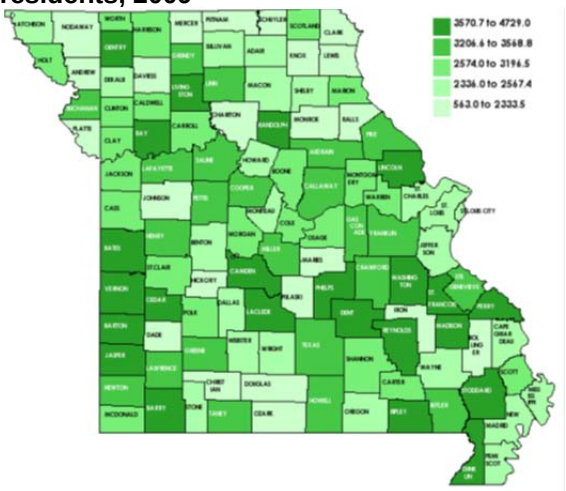


Fall-related injury

The national rate for all injuries among adults aged at least 65 years is 51 falls per 1,000 population. Rates increase with age and are higher among women.[7] Although falls in older people are frequent and serious, those with personal assistance alarms typically do not use them.[8] Older, non-Hispanic white adults have higher rates of fall injuries compared to non-Hispanic blacks. Also, older adults with chronic conditions and activity limitations have higher rates of fall injuries compared to older adults without these conditions.

The most common causes of fall injuries among older adults are slipping, tripping, or stumbling and most fall injuries occur inside or around the

Figure 15.4. Unintentional fall-related injuries per 100,000 population among Missouri residents, 2009



(source: Missouri Department of Health and Senior Services)

outside of the home. Almost 3% of all falls among persons aged at least 65 years involve walkers and canes.[9] Pets, particularly dogs, present a serious fall hazard.[10] Nearly one-third of older adults who experience a fall injury need help with activities of daily living as a result. More than half of these individuals need this help for at least 6 months. The distribution of fall related injuries per 100,000 population for Missouri counties is shown in Figure 15.4. The counties in which Kansas City is situated were in lower quintiles. The 10 year trend in the rates of fall injuries is shown in Figure 15.5..In 2009, 56 unintentional fall injuries were fatal. Table 15.2 summarizes fall injuries and deaths for the period 2005-2009. Although women experienced more fall-related injuries than men, men had a higher fall-specific death rate. Non-Hispanic white men had a fall-specific death rate more than 3 times that of non-Hispanic black or Hispanic men. Among women, the fall-specific death rate for non-Hispanic whites was more than 4 times higher than that for non-Hispanic blacks or Hispanics.

An earlier analysis of fall injuries in Kansas City showed that most common type of falls on the same level were due to slipping, tripping, or stumbling.[11] Women had higher rates of emergency department visits from falls involving steps and stairs than did men, whereas men had higher rates for falls from ladders, scaffolding, and buildings or structures. For both men and women, the total number of falls involving stairs/steps, ladders or scaffolding, and from one level to another was not appreciably different from the number resulting from falls on the same level (slipping, tripping, or stumbling).

Fall-related injury and death among both the elderly and workers on-the-job have received considerable attention, but not injuries to young and middle-aged adults. This group is especially important due to the fact that falls amongst this age group represent a risk for related expenses and potential interference with work and family. Among

Table 15.2. Fall-specific death rates per 1,000 population fall-related injuries by sex and race/ethnicity, Kansas City, MO, 2005-2009

	Males					
	Total			White, non-Hispanic		
Age	Injuries	Deaths	Rate[1]	Injuries	Deaths	Rate
< 15 y	**9,044**	1	0.1	4,564	1	0.2
15-24 y	**3,174**	4	1.3	1,694	1	0.6
25-44 y	**6,214**	12	1.9	3,776	8	2.1
45-64 y	**5,377**	31	5.8	3,301	19	5.8
≥65 y	**2,834**	104	36.7	2,247	96	42.7
Total	26,643	**152**	5.7	15,582	**125**	8.0

	Black, non-Hispanic			Hispanic		
Age	Injuries	Deaths	Rate	Injuries	Deaths	Rate
< 15 y	3,463	0	0.0	1,017	0	0.0
15-24 y	1,285	3	2.3	195	0	0.0
25-44 y	2,095	3	1.4	343	1	2.9
45-64 y	1,929	11	5.7	147	1	6.8
≥65 y	516	6	11.6	71	1	14.1
Total	9,288	**23**	2.5	1,773	**3**	1.7

	Females					
	Total			White, non-Hispanic		
Age	Injuries	Deaths	Rate	Injuries	Deaths	Rate
< 15 y	6,541	0	0.0	3,451	0	0.0
15-24 y	3,206	0	0.0	1,817	0	0.0
25-44 y	7,869	2	0.3	4,712	2	0.4
45-64 y	7,402	11	1.5	4,730	8	1.7
≥65 y	6,308	137	21.7	4,873	122	25.0
Total	31,326	**150**	4.8	19,583	**132**	6.7

	Black, non-Hispanic			Hispanic		
Age	Injuries	Deaths	Rate	Injuries	Deaths	Rate
< 15 y	2,318	0	0.0	772	0	0.0
15-24 y	1,266	0	0.0	123	0	0.0
25-44 y	2,920	0	0.0	237	0	0.0
45-64 y	2,518	1	0.4	154	2	13.0
≥65 y	1,326	10	7.5	109	2	18.3
Total	10,348	**11**	1.1	1,395	**4**	2.9

[1] Age-specific death rate per 1,000 injuries

young adults, injuries from falls most frequently involve the wrist/hand, knees, and ankles, while middle aged adults tend to injure their knees.[12] Senior citizens report more head and knee injuries. Ambulation is cited as the cause of fall most frequently regardless of age or sex.

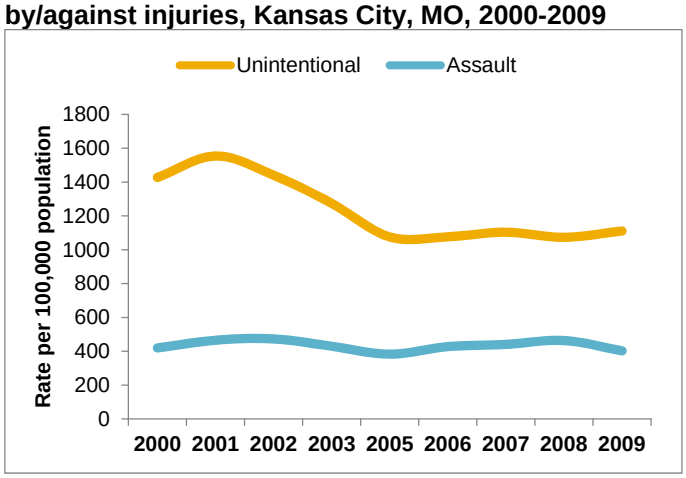
Falling often results from multiple concurrent problems including environmental and behavioral factors as well as disease processes. For example, middle-aged adults progressively start to have a higher incidence of diseases and medication use. Along with lower levels of physical activity, physiological changes also begin to alter posture stability. Events in this group are likely to predispose individuals for the higher risks that lead to falls in later years.

Stuck by/against injury

The second leading source of injuries among Kansas City residents are those resulting from being struck by a blunt object or by another person (fighting). Among Missouri counties, Jackson County has one of the highest rates for assault injuries (Figure 15.6).

Of the 7,200 reported struck by/against injuries in 2009, 73.0% were unintentional and 27.0% were assaults. The rates for unintentional injuries and those resulting from assaults have been relatively constant in recent years (Figure 15.7). Men sustained 65.4% of all injuries.

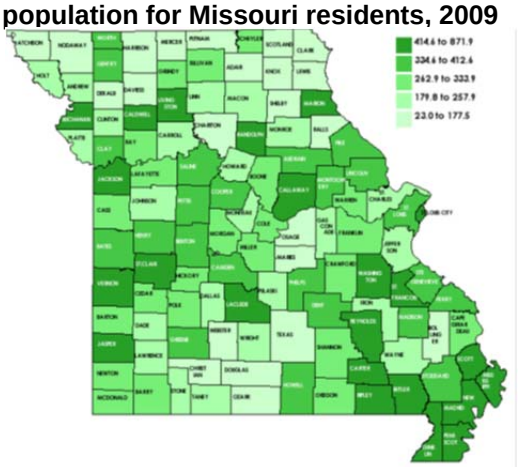
Figure 15.7. Rates per 100,000 population for struck by/against injuries, Kansas City, MO, 2000-2009



Motor vehicle crash injuries

Motor vehicle crashes lead to property damage, injuries, and death. Such crashes are the leading cause of injury death in the United States for persons 5-29 years of age. The National Highway Transportation Safety Administration (NHTSA) reported that 33,808 persons died on the nation's highways in 2009, a 9.7% decline from the prior year (www.nhtsa.dot.gov). The overall national motor vehicle crash fatality rate was 1.13 deaths/100 million vehicle miles traveled. In terms of overall mortality, racial/ethnic minorities are more likely to die in motor vehicle crashes than non-Hispanic blacks and whites.[13] The *Healthy People 2010* target for motor vehicle deaths was 9.2 per 100,000 population. Missouri's age-adjusted rate was 16.2 for 2008, falling short of the targeted rate.

Figure 15.6. Assault injuries per 100,000 population for Missouri residents, 2009

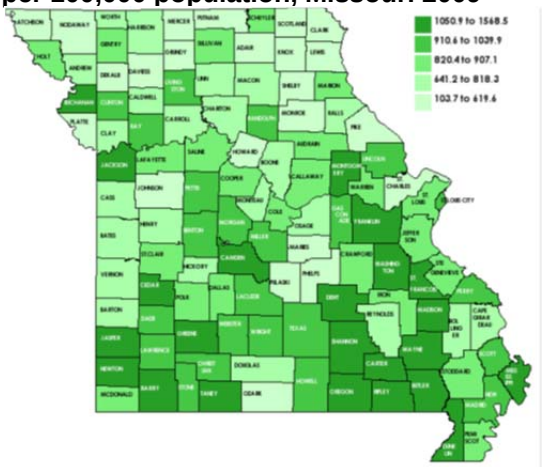


(source: Missouri Department of Health and Senior Services)

Missouri

According to the Missouri State Highway Patrol,[14] the state experienced 155,849 traffic crashes

Figure 15.9 Motor vehicle-related injuries per 100,000 population, Missouri 2009



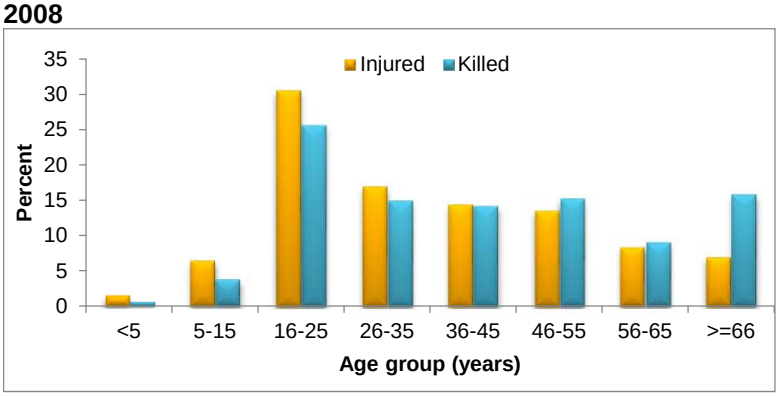
(source: Missouri Department of Health and Senior Services)

Table 15.3 Motor vehicle related fatalities, Missouri, 2008

Collision with	Percent of total	Number of crashes	Fatalities
Motor vehicle in transport	63.3	98,726	375
Parked motor vehicle	7.7	12,034	6
Motor vehicle on other roadway	0.2	245	9
Bicycle	0.4	622	2
Railroad train	0.0	40	6
Fixed object	20.7	32,227	389
Other object	0.9	1,457	4
Pedestrian	0.9	1,320	59
Animal	2.8	4,420	3
Non-collision overturning	2.3	3,513	98
Other non-collision	0.8	1,251	9

(source: Missouri State Highway Patrol)

Figure 15.8 Motor vehicle related injuries and deaths, Missouri, 2008



(source: Missouri State Highway Patrol)

$3,182,874,600. Of the crashes, 75.1% resulted in property damage only. That year, 55,149 persons were injured and 960 persons died in motor vehicle crashes (665 drivers, 228 passengers, 66 pedestrians, and 1 bicyclist). The number of fatalities declined 3.2% from the prior year. The 2008 injury and death rates per 100 million miles of travel for the state of Missouri were 76.0 and 1.3, respectively.

The types of motor vehicle crashes are shown in Table 15.3. Of all the persons killed, 40.7% were between 16 and 35 years of age and persons 16 to 20 years old comprised 14.3% of all fatalities (Figure 15.8). More than half of all fatal traffic crashes (57.5%) involved only one vehicle. Speed and drinking were the top two probable contributing circumstances in fatal crashes; alcohol was involved in 4.9% of all motor vehicle crashes and 28.6% of fatal crashes. Alcohol-related crashes resulted in 262 fatalities and 4,511 injuries.

Kansas City had the most traffic fatalities among all municipalities with 59 and Jackson County had the most traffic fatalities among the counties with 83. Urban areas of the state recorded 65.2% of all motor vehicle crashes, yet 63.4% of fatalities occurred in rural-area crashes. A comparison of motor vehicle-related injury rates by county is shown in Figure 15.9; all four counties in which Kansas City is located were in the 2nd lowest quintile.

Seat belts and air bags significantly lower the risk of serious injury and death in motor vehicle crashes.[15] Nationwide, seat belt use is 83%. NHTSA reported Missouri's rate of seat belt use to be 75.8% in 2008. According to Missouri Behavioral Risk Factor Surveillance System (BRFSS) data, women were 15% more likely to wear a seat belt than men and whites were 9% more likely to do so than blacks.[16] Seat belt usage increased with educational level. In the Kansas City region of the state, seat belt usage was 77.2%, the highest for any region.

Primary seat belt laws which allow

police to stop a motorist and issue a citation are more effective for increasing seat belt usage and reducing traffic fatalities than are secondary seat belt laws (police can only issue seat belt citation after stopping motorist for another violation).[17] The use of seat belts helps reduce the risk of death regardless of where in the vehicle a person is sitting. Missouri does not have a primary seat belt law for adults although it does have one for persons younger than 16 years of age. The NHTSA has estimated that the adoption of a primary seat belt law in Missouri would save 89 lives and prevent more than 1,000 serious injuries each year. Statewide, of persons killed in 2008, 69.8% of drivers and 65.8% of passengers were not wearing a seat belt. Persons who had been using alcohol and/or drugs were more likely not to be wearing a seat belt than persons who had not been using these substances.

According to the Missouri State Highway Patrol, seat belt usage rates by residents of Clay, Jackson, and Platte counties in crashes during 2008 were 96.8%, 96.1%, and 97.3%, respectively. The majority of Missouri's high school students report using seat belts, with only 11.9% (8.6% of girls, 15.1% of boys) rarely or never using a seat belt.[18]

Walking is the most dangerous mode of travel per mile in the United States. Although only 8.6% of all trips are made on foot, 11.4% of all traffic deaths are pedestrians.[19] Pedestrians comprise the second largest category of motor vehicle accident deaths following occupant deaths. In Missouri, during 2008, 59 pedestrians were killed by motor vehicles and 1,320 were injured. Among Missouri counties in 2008, Jackson County recorded the 3rd highest number of crashes involving pedestrians with 246, while Clay ranked 9th with 31 pedestrian-related crashes, and Platte ranked 14th with 15.

Nationally, the 11-year increase in motorcycle rider fatalities reversed itself in 2009 with a 16% decline from that in 2008. In Missouri, there were 2,571 motorcycle crashes resulting in 107 drivers and passengers killed and 2,169 injured.

Kansas City

Kansas City is a dangerous environment with respect to traffic fatalities and injuries. In 2008, Kansas City led all Missouri communities with motor vehicle crashes and motor vehicle-related fatalities. In 2008, the Kansas City Police Department (KCPD) recorded 18,718 traffic collisions. Of these, 55 of the collisions involved fatalities with a total of 59 fatalities and 4,164 involved injuries (Table 15.4) between them. Between 1990 and 2008, the age-adjusted death rates for City residents due to motor vehicle crashes have had a highly significant decline, and although they were higher than the *Healthy People 2010* objective of 9.2 per 100,000 population, the gap has been closing (Figure 15.10). In recent years, there have been significant declines in the rates for emergency department visits and hospitalizations resulting from motor vehicle traffic collisions (Figure 15.11).

Table 15.5 summarizes motor vehicle crashes in Kansas City for 2008, while providing a breakdown of traffic fatalities and injuries by portion of the city.

Table 15.4. Fatal traffic crashes, Kansas City, MO, 2004-2008

Year	Fatal Crashes	Persons Killed
2004	48	54
2005	66	71
2006	61	62
2007	52	58
2008	55	59

(source: Kansas City Police Department)

Figure 15.10. Age-adjusted death rates resulting from motor vehicle crashes, Kansas City, MO, 1990-2009

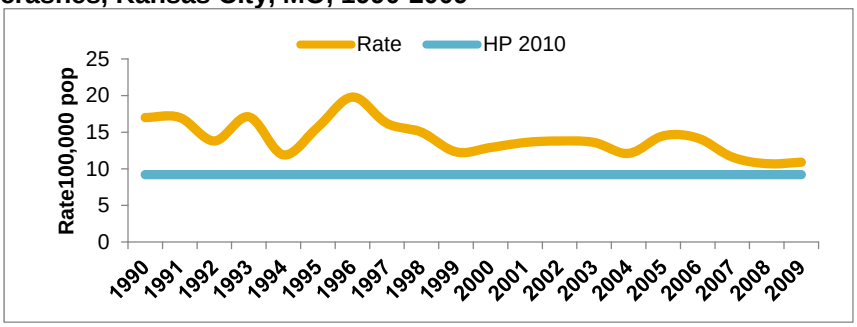


Figure 15.11. Rates per 100,000 population for emergency department visits and hospitalizations due to motor vehicle traffic crash related injuries, Kansas City, MO, 2000-2009

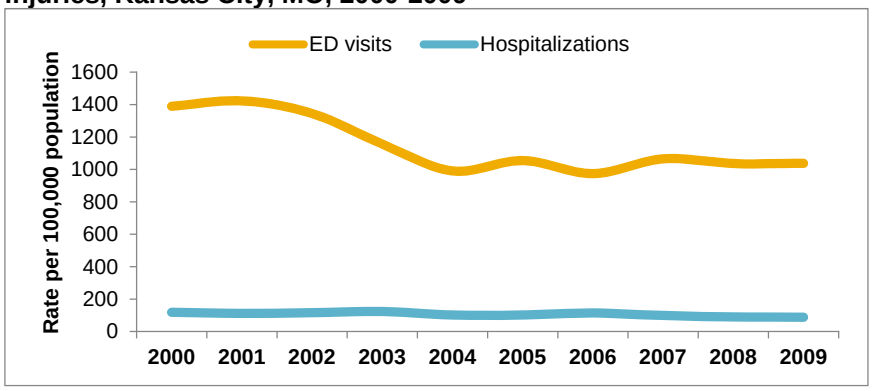


Table 15.5. Traffic crash summary for Kansas City, MO, 2008

		Total crashes	Speed involved	Drinking involved	Driver aged <21 years	Driver aged ≥55 years
Kansas City, all	Total crashes	17,348	3,046	506	2,715	3,975
	State ranking[1]	1	1	1	1	1
	Fatal	55	29	18	3	13
	Injury	3,792	887	274	740	957
Clay Co portion	Total crashes	2,307	453	95	341	526
	Fatal	8	4	2	1	2
	Injury	454	117	35	80	116
Jackson Co portion	Total crashes	13,625	2,328	360	1,970	3,152
	Fatal	45	24	15	2	11
	Injury	3,065	704	161	584	777
Platte Co portion	Total crashes	1,415	265	51	323	297
	Fatal	2	1	1	0	0
	Injury	272	66	18	76	64

		Commercial vehicle	Motorcycle	School bus	Bicycle	Pedestrian
Kansas City , all	Total crashes	1,357	240	109	50	209
	State ranking[1]	1	1	2	2	2
	Fatal	5	9	0	0	11
	Injury	279	162	22	37	179
Clay Co portion	Total crashes	161	48	10	2	15
	Fatal	0	2	0	0	1
	Injury	31	32	1	0	10
Jackson Co portion	Total crashes	1,089	168	98	45	181
	Fatal	5	7	0	0	9
	Injury	237	110	21	34	159
Platte Co portion	Total crashes	107	23	1	3	13
	Fatal	0	0	0	0	1
	Injury	11	19	0	3	10

		Fixed object	Hazardous materials	Work zone
Kansas City , all	Total crashes	2,809	6	281
	State ranking[1]	1	1	1
	Fatal	22	0	1
	Injury	724	2	65
Clay Co portion	Total crashes	494	0	57
	Fatal	6	0	0
	Injury	114	0	17
Jackson Co portion	Total crashes	2,034	5	178
	Fatal	16	0	1
	Injury	550	2	44
Platte Co portion	Total crashes	281	1	46
	Fatal	0	0	0
	Injury	60	0	4

(*Source: 2008 Missouri Traffic Safety Compendium, Missouri State Highway Patrol*)

Cutting/piercing injuries

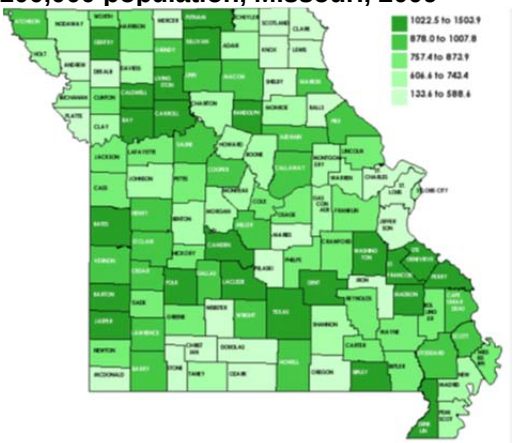
Among Missouri counties, Platte County has a rate for cutting/piercing injuries that places in the 2nd lowest quintile statewide. Jackson County is in the 2nd highest quintile and Cass and Platte counties are in between (Figure 15.12). The rates for unintentional injuries due to cutting/piercing in Kansas City have been declining (Figure 15.13).

During 2009, there were 3,376 injuries to Kansas City residents characterized as a cut or pierce wound, of which 87.3% were classified as unintentional. Of the overall injuries, 307 (9.1%) were the result of assault and 106 (3.1%) were self-inflicted. Only 99 (2.9%) of the injuries required hospitalization: 59 assaults, 7 self-inflicted, 28 unintentional, and 4 intention not recorded.

Of the cutting/piercing injuries to women, 90.6% were unintentional compared to 86.6% for men. Men accounted for 61.7% of the assault cases and 47.1% of the self-inflicted injuries. Of the 260 assaults among males, 67.1% involved non-Hispanic blacks, 22.8% involved non-Hispanic whites, and 6.8% involved Hispanics. For women, the breakdown was 85.7% of the 70 injuries were to non-Hispanic blacks, 10.0% to non-Hispanic whites, and 2.9% to Hispanics.

Among men whose injuries were self-inflicted, 55.1% were non-Hispanic white, 32.6% non-Hispanic black, and 6.1% Hispanic. Among women, the percentages were 68.4% non-Hispanic white, 19.3% non-Hispanic black, and 3.5% Hispanic.

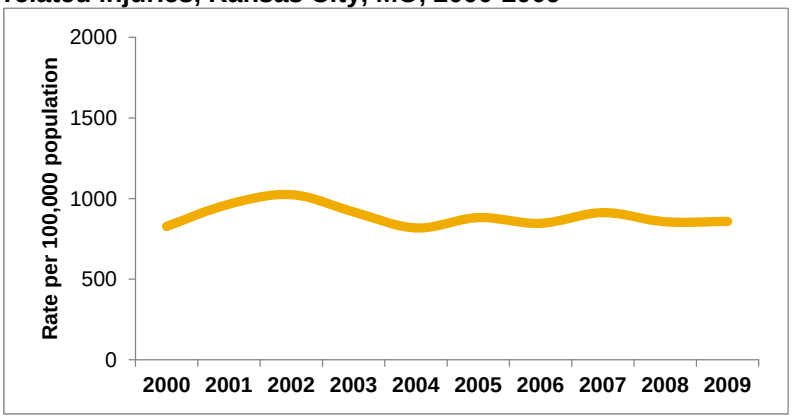
Figure 15.12. Cutting/piercing injuries per 100,000 population, Missouri, 2009



(source: Missouri Department of Health and Senior Services)

Figure 15.13. Rates per 100,000 population for cutting and piercing injuries, Kansas City, MO, 2000-2009

Figure 15.14. Rates per 100,000 population for over exertion related injuries, Kansas City, MO, 2000-2009



Over-exertion

In 2009, 4,113 Kansas City residents experienced unintentional over-exertion-related injuries. Although the rates have fluctuated over the years, no trend is evident (Figure 15.14). Of the over-exertion injuries, 53.7% (1,069

men and 1,140 women) of the injuries involved non-Hispanic whites, 38.7% (833 men, 757 women) involved non-Hispanic blacks, and 3.9% (87 men, 72 women) involved Hispanics. In 2009, only 1.0% of the over-exertion-related injuries required hospitalization.

Weather/wildlife related injuries

Weather-related injuries are discussed under the *Environmental Health* section of this assessment report. Bite and sting injuries from animals can be divided as canine (dog) bites, venomous bites/stings, and other bites/stings. Nationally, the most common sources of non-canine injuries are bees, spiders, and cats.[20]

About 4,000 dog bites occur annually among Kansas City residents, with the majority of bites not resulting in professional medical care being sought.[21] The numbers of dog bite victims seeking emergency medical care or hospitalization are shown in Figures 15.15 and 15.16. Of the 509 individuals bitten who sought medical care during 2009, 500 (98.2%) were treated in emergency departments and 9 (1.8%) were hospitalized. Most hospitalizations occurred among adults. Eight of the 9 persons hospitalized were adults.

In 2009, there were 63 emergency department visits and 11 hospitalizations resulting from the bite/sting of a venomous creature. There were also 1,286 emergency department visits and 8 hospitalizations for non-venomous non-canine bites/stings. Injuries in both categories were about evenly distributed between men and women.

Figure 15.15. Dog bite injuries treated at hospitals and rates per 100,000 population, Kansas City, MO, 2000-2009

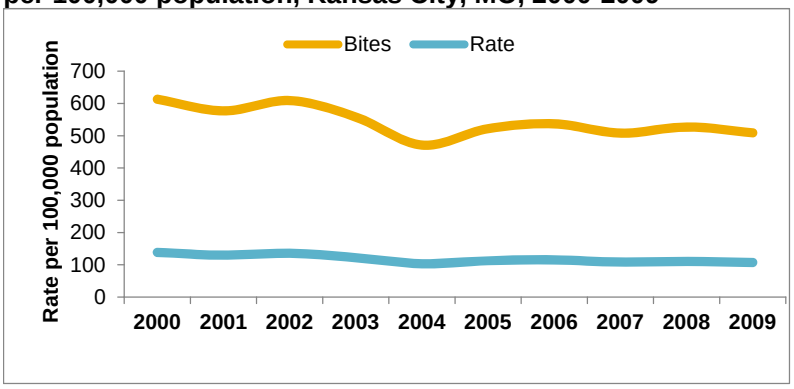
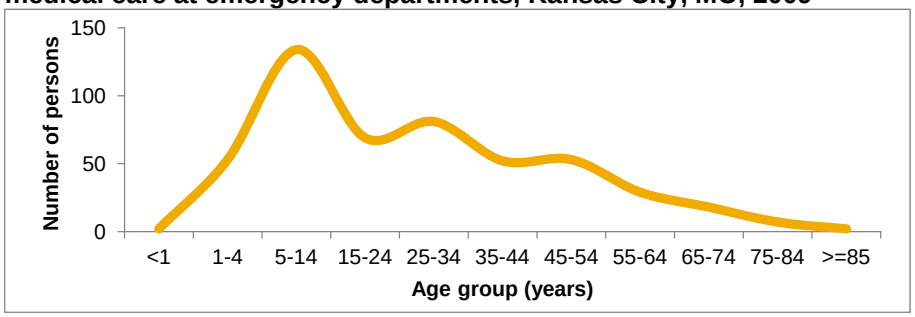


Figure 15.16. Age distribution of persons bitten by dogs who sought medical care at emergency departments, Kansas City, MO, 2009



Fire/burns

In 2009, 781 individuals experienced fire/burn injuries and 1 died. Of the injuries, 775 were unintentional and 6 were the result of assaults. The number of fire/burn injuries is shown in Figure 15.17. During 2009, 701 persons were treated in emergency departments and 80 persons were admitted to hospitals. Injury rates for males and females were fairly similar with slightly more men being injured. The age distributions for fire/burn injuries are presented in Figure 15.18. Cass, Clay, Jackson, and Platte counties are in the middle quintile of Missouri counties for rates of fire/burn related injuries per 100,000 population (Figure 15.19).

Figure 15.17. Injuries from fires and burns and rates per 100,000 population, Kansas City, MO, 2000-2009

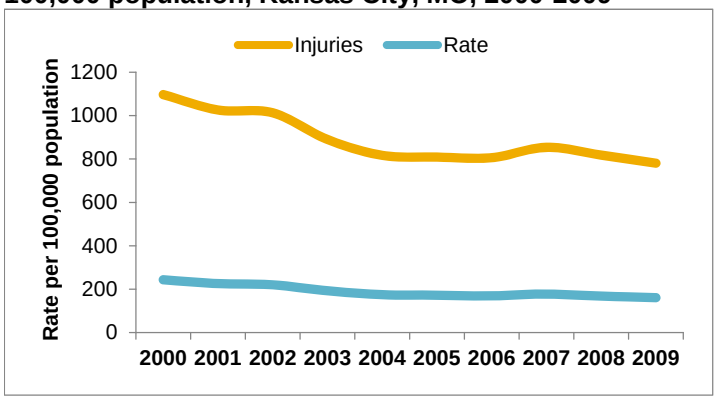


Figure 15.18. Age distribution of fire/burn injuries, Kansas City, MO, 2009

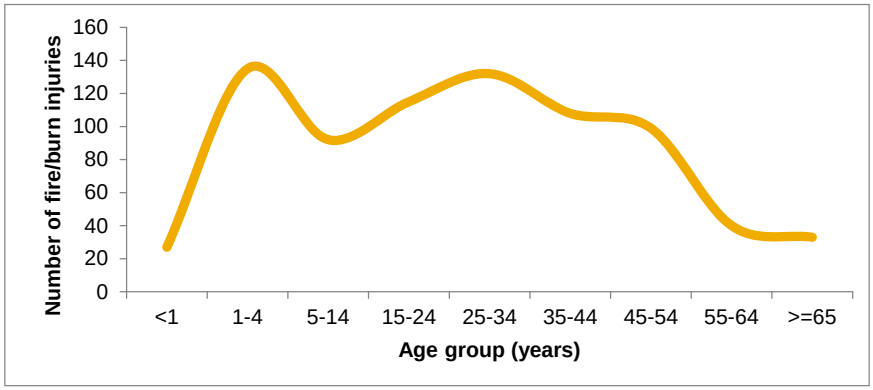
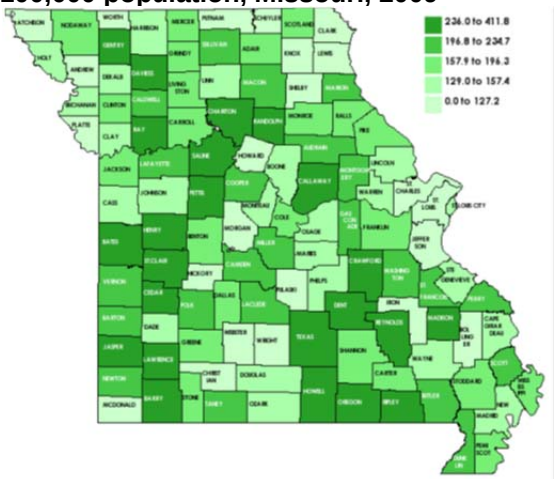


Figure 15.19. Fire/burn-related injuries per 100,000 population, Missouri, 2009



(source: Missouri Department of Health and Senior Services)

Poisoning/overdose

The Missouri Department of Health and Senior Services distinguishes drugs and alcohol from gas, cleaners, and caustics when defining injuries within the poisoning/overdose category. In 2009, there were 1,416 injuries from these substances (Table 15.6). Women had a slightly higher rate of injury from drugs and alcohol, but a significantly lower rate of injury from gas, cleaners, and caustics.

While during the 1980's and 1990's, the majority of drug-induced deaths was attributable to illicit drugs and was highest among blacks,[22] the 2000's drug-induced death rates among whites surpassed those of blacks and prescription drugs became the dominant cause. This change occurred as prescription drugs, especially prescription opioid painkillers and psychotherapeutic drugs, were prescribed more widely by physicians. In 2009, drugs and alcohol resulted in 612 emergency department visits and 630 hospitalizations, while gas, cleaners, and caustics resulted in 147 emergency department visits and 27 hospitalizations. The age distributions for poisoning/overdose injuries are shown in Figure 15.20. Cass and Platte counties were in the middle quintile of Missouri counties for injuries due to

Table 15.6. Poisoning/overdose injuries and age-adjusted rates per 100,000 population by mechanism, intent and sex, Kansas City, MO, 2009

	Drugs/Alcohol				Gas/cleaners/caustics/etc			
	Male		Female		Male		Female	
Intent	Injuries	Rate	Injuries	Rate	Injuries	Rate	Injuries	Rate
Assault	0	0.0	0	0.0	3	1.4	0	0.0
Self-injury	250	107.2	306	123.6	12	5.0	10	4.0
Unintentional	301	125.2	262	103.8	78	32.2	54	22.2
Intent unknown	67	27.9	56	22.1	11	4.6	5	2.0
Total	**618**	**260.3**	**624**	**249.5**	**104**	**43.1**	**70**	**28.6**

Figure 15.20. Age distribution of poisoning/overdose injuries, Kansas City, MO, 2009

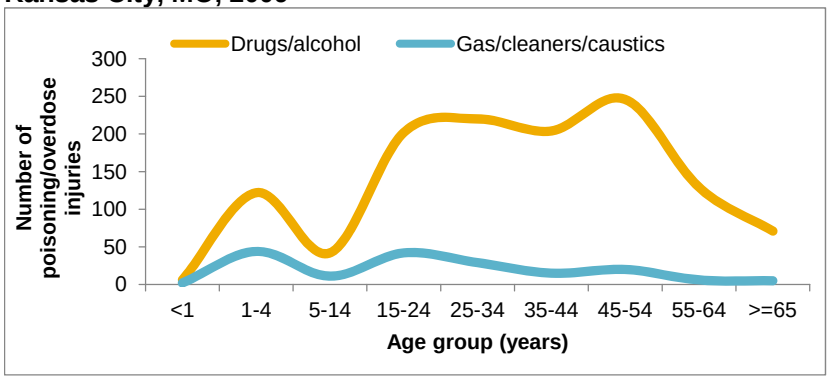
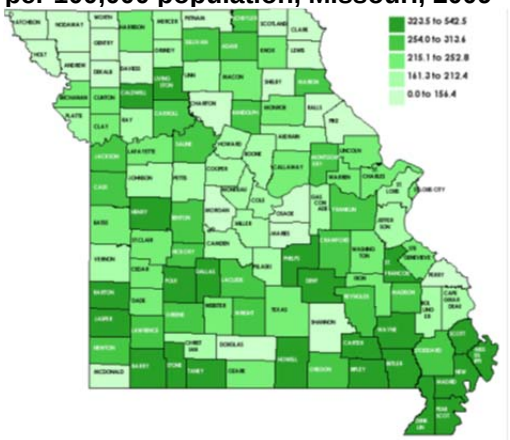
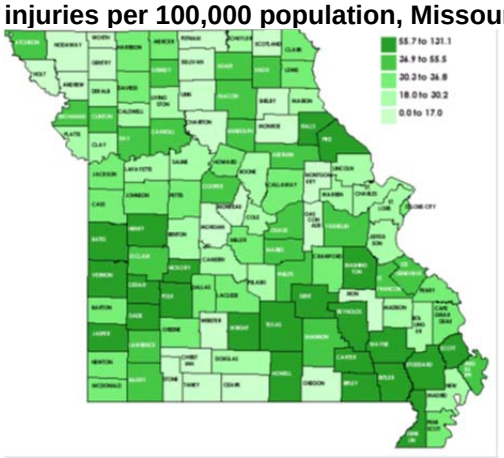


Figure 15.21. Drug/alcohol-related injuries per 100,000 population, Missouri, 2009



(source: Missouri Department of Health and Senior Services)

Figure 15.22. Gas/cleaners/caustics-related injuries per 100,000 population, Missouri, 2009



(source: Missouri Department of Health and Senior Services)

drugs/alcohol, while Clay and Jackson counties were in the 2nd highest quintile (Figure 15.21). For injuries from gas/cleaners/caustics, Cass, Clay, and Platte counties were in the middle quintile and Jackson was in the 2nd highest quintile (Figure 15.22).

Table 15.7. Firearm injuries by intent, sex, and race/ethnicity Kansas City, MO, 2009

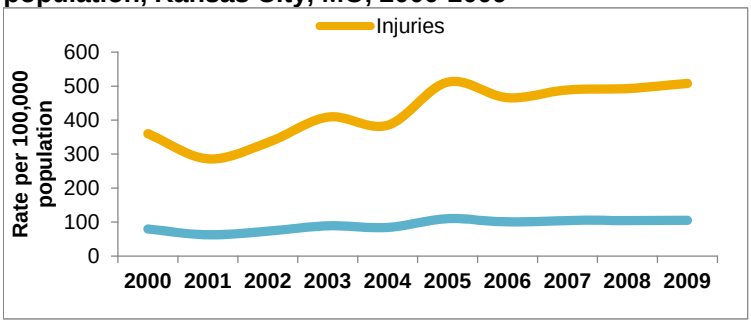
		Men			Women		
Intent	**Incidents**	**NHW[1]**	**NHB[2]**	**Hispanic**	**NHW**	**NHB**	**Hispanic**
Assault	342	20	248	10	5	31	0
Legal intervention	5	1	2	1	0	0	0
Self-injury	9	3	5	0	0	0	0
Unintentional	111	15	70	9	1	9	2
Unknown	41	5	23	1	1	5	0
Total	**508**	**44**	**348**	**21**	**7**	**45**	**2**

[1] NHW = non-Hispanic white; [2] NHB = non-Hispanic black

Firearm injuries

In 2009, 508 Kansas City residents were injured by firearms (Figure 15.23), with 38.6% being hospitalized. The majority of firearm-related injuries were as the result of an assault/legal intervention (Table 15.7). One hundred and two of the firearm injuries were unintentional, 6 were self-inflicted, and in 10 of the cases the intent was unknown. Non-Hispanic blacks were the persons injured most often. The age distribution for assault and unintentional firearm injuries is shown in Figure 15.24.

Figure 15.23. Firearm related injuries and rates per 100,000 population, Kansas City, MO, 2000-2009



While 38.6% of persons injured by assault, legal intervention, self-infliction, or unknown intent had to be hospitalized, only 15.8% of those who experienced an unintentional firearm-related injured were hospitalized.

Nationally, injuries from gunshots result in $802 million every year in hospital charges, with nearly a third of victims being uninsured.[23] More than half of the shootings occur during assaults, 30% are accidental, and 8% are self-inflicted. Initial stays cost, on average, $24,000 for assault cases and $30,000 for accident cases. About 7% of victims die from their injuries, 12% go to other health facilities for rehabilitation or other care, and 75% recover and return home. In 2007, 30,769 persons in the United States died from firearm injuries; suicide and homicide were the major causes accounting for 56.4% and 39.42%, respectively. Interestingly, among children and adolescents, there is no significant difference in firearm-related mortality when comparing rural and urban counties; the greater homicide rate in urban counties is counterbalanced by greater suicide and unintentional firearm death rates in rural counties.[24]

In the Kansas City metropolitan area, record numbers of people are applying for permits to carry concealed firearms, according to an article in the June 29, 2009 issue of the *Kansas City Star* (page A1).

Abuse/neglect/rape

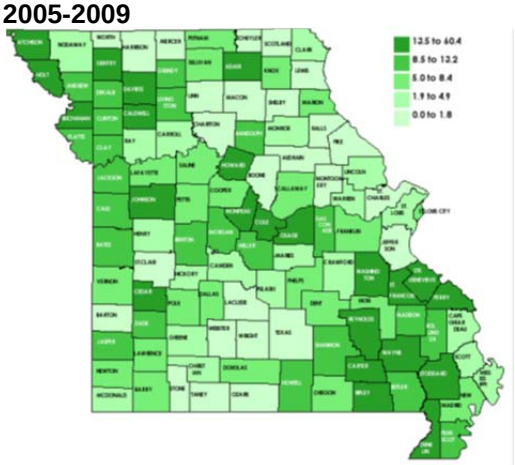
This category of injuries includes a variety of forms of abuse. In 2009, emergency departments and hospitals in Kansas City treated 405 individuals for some form of abuse/neglect/rape (Table 15.8). Many individuals who experience these types of injuries may not seek medical assistance. Women are more often the victim. One person died from physical abuse.

Table 15.8. Abuse/neglect/rape injuries by sex, Kansas City, MO, 2009

Mechanism	Incidents	Women	Men
Spouse/partner abuse	55	53	2
Sexual abuse	56	49	7
Physical abuse	185	147	38
Neglect/emotional abuse	4	4	0
Rape	3	3	0
Abuse unspecified	102	92	10
Total	**405**	**348**	**57**

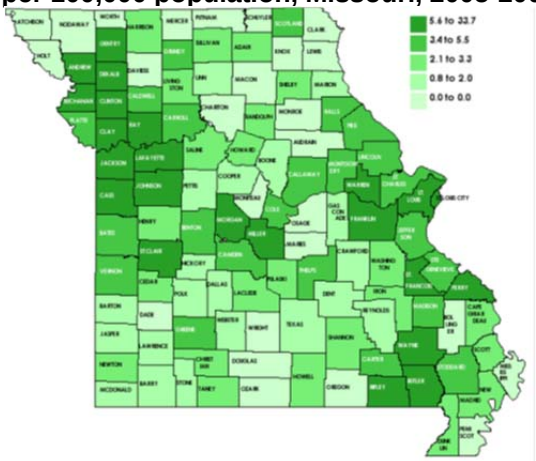
Cass, Clay and Platte counties rank in the 2nd highest quintile of Missouri counties for spouse/partner related injuries while Jackson County is the middle quintile (Figure 15.25). For physical abuse injuries, Platte County is in the 2nd highest quintile, while Cass, Clay and Jackson all are in the highest quintile (Figure 15.26). And, for sexual abuse, Cass County is in the middle quintile, Clay and Platte counties in the 2nd highest quintile and Jackson in the highest quintile (Figure 15.27).

Figure 15.25. Spouse/partner abuse-related injuries per 100,000 population, Missouri, 2005-2009



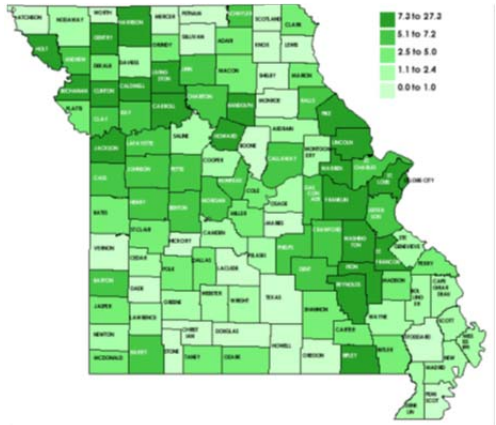
(source: Missouri Department of Health and Senior Services)

Figure 15.26. Physical abuse-related injuries per 100,000 population, Missouri, 2005-2009



(source: Missouri Department of Health and Senior Services)

Figure 15.27. Sexual abuse-related injuries per 100,000 population, Missouri, 2005-2009



(source: Missouri Department of Health and Senior Services)

Literature cited

[1] Bergen G et al. *Injury in the United States: 2007 Chartbook*. Hyattsville, MD: National Center for Health Statistics. 2008.

[2] Xu J et al. Deaths: final data for 2007. *Natl Vital Stat Rep* 2010;58:#19. www.cdc.gov/nchs

[3] Niska R et al. National Hospital Ambulatory Care Survey: 2007 emergency department summary. *Natl Health Stat Rep* 2010;#26, 6 Aug.

[4] Finkelstein EA et al. Medical expenditures attributable to injuries – United States, 2000. *MMWR Morb Mortal Wkly Rep* 2004;53:1-4.

[5] Adekoya N, Moffett DB. State-specific unintentional-injury deaths – United States, 1999-2004. *MMWR Morb Mortal Wkly Rep* 2007;56:1137-1140.

[6] Hu G, Baker SP. Trends in unintentional injury deaths, US, 1999-2005:age, gender, and racial/ethnic differences. *Am J Prev Med* 209;37:188-194.

[7] Schiller JS et al. Fall injury episodes among noninstitutionalized older adults: United States, 2001-2003. *Adv Data Vital Health Stat* 2007;392. www.cdc.gov/nchs

[8] Flemming J et al. Inability to get up after falling, subsequent time on floor, and summoning help: prospective cohort study in people over 90. *Brit Med J* 2008;337:a2751.

[9] Stevens JA et al. Unintentional fall injuries associated with walkers and canes in older adults treated in US emergency departments. *J Am Geriatric Soc* 2009;57:1464-1469.

[10] Stevens JA et al. Dogs and cats as environmental fall hazards. *J Safety Res* 2010;41:69-73.

[11] Kansas City Health Department. Injuries and deaths from falls among Kansas Citians. *Community & Hospital Letter* 2005;26(3). www.kcmo.org/health

[12] Talbot LA et al. 2005. Falls in young, middle-aged and older community dwelling adults: perceived cause, environmental factors and injury. *BMC Public Health* 5:86.

[13] West BA, Naumann RB. Motor vehicle-related deaths – United States, 2003-2007. *MMWR Morb Mortal Wkly Rep* 2011;60(January supplement):S52-S55.

[14] Missouri State Highway Patrol. *Missouri Traffic Crashes 2009 edition;2008 statistics.* www.mshp.dps.missouri.gov

[15] Cummings P, Rivara FP. Car occupant death according to the restraint use of other occupants: a matched cohort study. *J Am Med Ass* 2004;291:343-349.

[16] Missouri Department of Health and Senior Services. 2008 Behavioral Risk Factor Surveillance System Annual Report. www.dhss.mo.gov

[17] Centers for Disease Control and Prevention. Impact of primary laws on adult use of safety belts – United States, 2002. *MMWR Morb Mortal Wkly Rep* 2004;53:257-260.

[18] Eaton DK et al. Youth risk behavior surveillance – United States, 2009. *MMWR Morb Mortal Wkly Rep Surv Summ* 2010;59:SS-5.

[19] Ernst M. 2004. Mean Streets. How far have we come? Pedestrian safety, 1994-2003. Surface Transportation Policy Project. 2004. www.transact.org.

[20] O'Neil ME et al. Epidemiology of non-canine bites and sting injuries treated in US emergency departments, 2001-2004. *Publ Health Rep* 2007;764-775.

[21] Hoff GL et al. Emergency department visits and hospitalizations resulting from dog bites, Kansas City, Mo, 1998-2002. *Missouri Med* 2005;102:565-568.

[22] Paulozzi LJ. Drug-induced deaths – United States, 2003-2007. *MMWR Morb Mortal Wkly Rep* 2011;60(January supplement):S60-S61).

[23] Coben JH, Steiner CA. Hospitalization for firearm-related injuries in the United States, 1997. *Am J Prev Med* 2003;24:1-8.

[24] Nance ML et al. Variation in pediatric and adolescent firearm mortality rates in rural and urban US counties. *Pediatrics* 2010; 125:1112-1118.