

# THE BURDEN OF INJURY IN OHIO: 2000 - 2010



**VIOLENCE AND INJURY PREVENTION PROGRAM  
OHIO DEPARTMENT OF HEALTH**

**OCTOBER 2012**

**DATA PROVIDED BY THE OHIO HOSPITAL ASSOCIATION**



**OHIO DEPARTMENT OF HEALTH**

DIVISION OF PREVENTION AND HEALTH PROMOTION

BUREAU OF HEALTHY OHIO

***VIOLENCE AND INJURY PREVENTION PROGRAM***

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## **THE OHIO VIOLENCE AND INJURY PREVENTION PROGRAM OVERVIEW**

Injury is the leading cause of death for Ohioans ages 1 to 44 and the 5<sup>th</sup>-leading cause of death overall. The goal of the Ohio Violence and Injury Prevention Program (VIPP) is to continue development of a comprehensive injury prevention program by establishing and sustaining a solid infrastructure that includes statewide injury surveillance to inform and evaluate public policy, as well as comprehensive injury prevention programs.

The VIPP strives to:

- Coordinate surveillance systems that collect injury data.
- Assess the burden of injuries and violence, and communicate information for the purpose of action.
- Promote evidence-based injury prevention interventions for at-risk populations.
- Coordinate and collaborate with partners in building program infrastructure.
- Encourage the adoption of policies and programs that lead to the prevention of injuries.
- Provide technical support and training as needed.
- *Ultimately, make Ohio a safer place to live, work and play by reducing death and disability associated with intentional and unintentional injury.*

The VIPP is working to develop a comprehensive injury prevention program for the State of Ohio. Current VIPP initiatives include:

**Ohio Injury Prevention Partnership (OIPP)** – The OIPP is a group of professionals representing a broad range of agencies and organizations concerned with building Ohio’s capacity to address the prevention of injury, particularly related to the group’s identified priority areas of falls among older adults, prescription drug abuse and overdose, child injury and violence prevention (suicide and firearm related). The OIPP was convened in November 2007 and is coordinated by ODH with funds from the Centers for Disease Control and Prevention (CDC) National Center for Injury Prevention and Control (NCIPC). The OIPP helps to improve statewide collaboration around injury prevention and will assist ODH with establishing priorities and future directions regarding injury and violence prevention in Ohio.

**Local Injury Prevention Grant Program** – Through the CDC’s Preventive Health and Health Services Block Grant (PHHSBG), the VIPP provides funding annually to local programs targeting injury. The goal of this grant program is to reduce injury and injury-related deaths to Ohioans through the development of comprehensive, multi-faceted, population-based programs at the local level that address the risks associated with injuries. The nine currently-funded projects (2010-2013 cycle) focus on the following injury priorities: unintentional child/youth injury; falls among older adults; and unintentional prescription drug poisoning.

**Child Passenger Safety (CPS) Program** – With fines collected through enforcement of Ohio’s child restraint law (Ohio Revised Code Section 4511.81), ODH’s CPS Program provides child safety seats to eligible low-income families in all Ohio counties. The overall goal of this program is to increase

Ohio Violence and Injury Prevention Program, Ohio Department of Health

the availability of child safety seats and booster seats for low income families in Ohio and to increase proper use and correct installation of child safety seats. ODH distributes approximately 45-60 seats to each of the 88 counties per year based on the availability of funds. The CPS Program works in coordination with regional occupant protection coordinators funded by the Ohio Department of Public Safety who serve as liaisons between ODH and the county seat distribution contacts.

### Surveillance Activities

- **Injury Surveillance** – The injury surveillance program assesses the burden of overall injury and specific types of injury in Ohio through the examination of multiple data sets including hospital discharge, death certificates, and other sources of injury-related data. Using these data, the VIPP monitors trends and emerging injury issues, produces annual reports and responds to requests for data.
- **Census of Fatal Occupational Injuries (CFOI)** – With funding from the Bureau of Labor Statistics and the Ohio general revenue fund, the CFOI Program provides the public, employers and safety personnel with comprehensive data surrounding fatal occupational-related injuries in Ohio. Data are collected from several sources including death certificates, workers' compensation reports, Occupational Safety and Health Administration (OSHA) reports, traffic crash records, agricultural injury reports and media clippings. The data are collated at the national level and used to establish occupational safety policies and programs.
- **Ohio Violent Death Reporting System (OH-VDRS)** – In September 2009, the CDC awarded a grant to the VIPP to participate in the National Violent Death Reporting System (NVDRS), enabling Ohio to address a critical need in the state: the collection and analysis of high quality data on violent death. With this funding, the VIPP collects and links Vital Statistics data; coroner data from the 88 county coroners; and local law enforcement data to better understand the circumstances surrounding and contributing to violent deaths in Ohio. These data will ultimately be used to develop recommendations regarding the prevention of violent death in Ohio. The NVDRS operates in 18 states, combining data on violent deaths including homicides, suicides, legal intervention deaths, unintentional firearm injury deaths, and deaths of undetermined intent.

*Please visit the VIPP website for more information, resources and program updates.*

Go to: <http://www.healthyohioprogram.org/vipp/injury.aspx>

## **EXECUTIVE SUMMARY**

This report reviews injuries for Ohioans from 2000 to 2010. Data for this report were derived from Ohio Hospital Association hospital inpatient discharge and emergency department (ED) datasets and Ohio death certificate files.

### **Fatalities:**

- 7,156 people died from an injury in Ohio in 2010. On average, 20 people die from an injury every day statewide.
- The death rate for injuries increased 33 percent between 2000 and 2010.
- The leading causes of injury death in 2010 were unintentional poisoning, suicide, motor vehicle traffic crashes, and falls. The risk profile for the leading causes of injury varies by segment of the population. The following groups are disproportionately at risk for the leading causes of injury death.
  1. Unintentional poisoning: Males, ages 25-54, and whites
  2. Suicide: Males, ages 25-54, and whites
  3. Motor vehicle traffic crashes: Males, ages 15-24 and ages 85 or older
  4. Falls: Ages 85 or older
- Death rates increased rapidly for poisoning, suicides, and fall related injuries while rates have decreased for motor vehicle traffic related injuries between 2000 and 2010.

### **Hospitalizations:**

- 72,485 injury related hospitalizations occurred in Ohio in 2010. On average, 199 hospitalizations occur in Ohio every day.
- The injury hospitalization rate changed very little between 2002 and 2010.
- The leading causes of injury hospitalizations were falls, self-harm, motor vehicle traffic crashes, and unintentional poisoning. The risk profile for the leading causes of injury hospitalizations varies by segment of the population. The following groups were identified as at risk.
  1. Falls: Females and ages 85 or older
  2. Self-harm: Females and ages 15-44
  3. Motor vehicle traffic crashes: Males and ages 15-24
  4. Unintentional poisoning: Ages 45 or older
- Hospitalization rates increased for self-harm and unintentional poisoning related injuries while rates associated with motor vehicle traffic related injuries decreased between 2002 and 2010. Rates of fall related hospitalizations increased between 2002 and 2003 then remained the same between 2003 and 2010.

### **Emergency Department Visits (ED):**

- 1.36 million ED visits in Ohio were associated with injuries in 2010. On average, 3,726 visits were made to emergency departments every day in Ohio.
- The injury ED visit rate changed very little between 2002 and 2010.
- The leading causes of injury ED visits were falls, motor vehicle traffic crashes, assaults, and unintentional poisoning. The risk profile for the leading causes of injury ED visits varies by segment of the population. The following groups were identified as at risk.
  1. Falls: Females and ages 85 or older
  2. Motor vehicle traffic crashes: Females and ages 15-34
  3. Assaults: Males and ages 15-34
  4. Unintentional poisoning: Ages 1-4
- ED visit rates increased for injuries associated with falls, motor vehicle traffic, assaults, and unintentional poisoning.

### **Social and Economic Costs:**

- Injury related deaths, hospitalizations, and ED visits cost Ohio an estimated \$13 billion in 2010. The estimate includes costs associated with medical care and worker productivity.
- Costs associated with injuries increased 21 percent between 2002 and 2010.
- The leading cause of injury costs in 2010 were falls (\$2.6 billion), motor vehicle traffic (\$2.3 billion), unintentional poisoning (\$2.0 billion), suicide or self-harm (\$1.7 billion), and homicides or assaults (\$1.3 billion).
- Rapid increases in costs were found among unintentional poisoning (117 percent), falls (40 percent), and suffocation (15 percent) while a significant decrease in costs occurred among injuries associated with motor vehicle traffic crashes (20 percent).
- Injuries were associated with over 109,000 years of potential life lost each year which is the leading cause of potential life loss in Ohio.

### **Violence and Injury Prevention:**

The Ohio Department of Health (ODH) is funded by the Centers for Disease Control and Prevention to build capacity related to the prevention and control of injuries and to develop or strengthen injury surveillance programs. ODH coordinates a statewide group of injury prevention stakeholders, the Ohio Injury Prevention Partnership, to build capacity to address the leading causes of injury in Ohio. The group has identified falls among older adults, drug poisonings, child injury and violence prevention (suicide and firearm related) as priority areas.

## SECTION 1: INTRODUCTION AND OVERVIEW: INJURY DEFINED



The National Safety Council defines **INJURY** as:

*Physical harm or damage to the body resulting from an energy exchange, usually acute mechanical (e.g., motor vehicle crash, falls), chemical (e.g., poisoning), thermal (e.g., fire/burn) or other environmental energy (e.g., hyperthermia, suffocation, drowning) that exceeds the body's tolerance.*

Injuries can further be classified by the intent or purposefulness of occurrence in two categories: intentional and unintentional injuries. Intentional injuries are purposely inflicted and often associated with violence. These include child and elder maltreatment, domestic violence, sexual assault, aggravated assault, homicide, and suicide. Unintentional injuries include those that occur without intent of harm and are not purposely inflicted.

In this report, we will examine the burden of unintentional injury as well as injury resulting from intentional acts such as self harm and assaults. The term “unintentional injury” will be used to describe what may commonly be referred to as an accident. The term accident implies a random act; however, most injuries are predictable and preventable. Like diseases, injuries follow recognizable patterns that can be studied and used to inform prevention strategies such as policy and behavior change.

Injuries may be classified by the:

- Mechanism or source of the energy transfer (e.g., motor vehicle, firearms, falls).
- Outcome or result of the transfer of injury (e.g., traumatic brain injury, poisoning, burns).
- Intention of the acts causing the injury (e.g., suicide, abuse, homicide).
- Events/activities or locations that precede them (e.g., playground-related, occupational-related, agricultural-related).

Overlap among these categories exists; for example, motor vehicle-related injuries cause traumatic brain injury. Firearm-related injuries include suicide, homicide and unintentional acts. Playground-related injuries involve falls, strangulation, struck-by and other mechanisms of injury.

The first step in understanding injury is to collect and analyze data. Through the epidemiological study of injury, we can address questions such as “How many people die from violent injury in Ohio each year? Who is most likely to die in a fall? What age groups are most affected by poisoning? By answering these questions, injury data can also lead to important prevention strategies. This report was created to help answer these questions and to provide data to help inform prevention strategies and policies.

## INJURY MECHANISMS

The cause, or mechanism, describes the way in which the person sustained the injury; how the person was injured; or the process by which the injury occurred. The cause of injury is the **underlying cause**, rather than the direct cause. The underlying cause is what starts the chain of events that leads to an injury. The direct cause is what produces the actual physical harm. The underlying and direct causes can be the same or different. For example, if a person cuts his or her finger with a knife, the cut is both the underlying and direct cause. However, if a child falls and hits his head on a coffee table, the fall is the underlying cause (the action that starts the injury event), and the contact with the table is the direct cause (the action that causes the actual physical harm). If we can prevent the underlying cause, we can stop the injury from occurring in the first place. In other words, without the underlying cause, there would be no direct cause.

Throughout this report, fatal injuries are defined as a death with any injury listed as the underlying cause of death on the death certificate and non-fatal injuries are defined as an injury listed in the primary diagnostic field of the hospital inpatient or emergency department record. Intent and mechanism of injuries were based on the International Classification of Diseases (ICD) which is a system designed to promote international comparability of statistics. It provides a way to classify medical terms reported by physicians, medical examiners, and coroners on death certificates and data from physician offices and hospital inpatient and outpatient records so they can be grouped together for statistical purposes. The following ICD mechanism groups were used in this report. A list of ICD-9 (ED and hospitalization) and ICD-10 (deaths) codes may be found in Appendix 4 and 5.

### Cause of Injury Categories

1. **Cut/pierce/stab:** Injury resulting from an incision, slash, perforation, or puncture by a pointed or sharp instrument, weapon, or object. This category does not include injury from being struck by or against a blunt object (such as the side of a night stand) or bite wounds; these injuries fall in the category "struck by/against."
2. **Drowning/submersion:** Suffocation (asphyxia) resulting from submersion in water or another liquid.
3. **Fall:** Injury received when a person descends abruptly due to the force of gravity and strikes a surface at the same or lower level.
4. **Fire/burn/smoke inhalation:** Severe exposure to flames, heat, or chemicals that leads to tissue damage in the skin or places deeper in the body; injury from smoke inhalation to the upper airway, lower airway, or lungs.

Ohio Violence and Injury Prevention Program, Ohio Department of Health

5. **Firearm gunshot:** A penetrating force injury resulting from a bullet or other projectile shot from a powder-charged gun. This category includes gunshot wounds from powder-charged handguns, shotguns, and rifles. This category does not include injury caused by a compressed air-powered paint gun or a nail gun, which falls in the "other specified" category.
6. **Foreign body:** Injury resulting from entrance of a foreign body into or through the eye or other natural body opening that does not block an airway or cause suffocation (asphyxia). Examples include pebble or dirt in eye, BB in ear, or small children's toys in esophagus.
7. **Suffocation:** Inhalation, aspiration, or ingestion of food or other object that blocks the airway or causes suffocation (asphyxia); intentional or unintentional mechanical suffocation due to hanging, strangulation, lack of air in a closed place, plastic bag or falling earth. This category does not include injury resulting from a foreign body that does not block the airway (see foreign body).
8. **Machinery:** Injury that involves operating machinery, such as drill presses, fork lifts, large power-saws, jack hammers, and commercial meat slicers. This category does not include injury involving machines not in operation, falls from escalators or moving sidewalks, or injuries from powered lawn mowers or other powered hand tools or home appliances.
9. **Natural / environmental:** Injury resulting from exposure to adverse natural and environmental conditions (such as severe heat, severe cold, lightning, sunstroke, large storms, and natural disasters) as well as lack of food or water.
10. **Bite / sting:** Injury from a poisonous or non-poisonous bite or sting through the skin, other than a dog bite. This category includes human bite, cat bite, snake or lizard bite, insect bite, stings from coral or jellyfish, or bites and stings by other plants and animals.
11. **Other specified causes:** Injury associated with any other specified cause that does not fit another category. Some examples include causes such as electric current, electrocution, explosive blast, fireworks, and overexposure to radiation, welding flash burn, or animal scratch.
12. **Overexertion:** Working the body or a body part too hard, causing damage to muscle, tendon, ligament, cartilage, joint, or peripheral nerve (e.g., common cause of strains, sprains, and twisted ankles). This category includes overexertion from lifting, pushing, or pulling or from excessive force.
13. **Poisoning:** Ingestion, inhalation, absorption through the skin, or injection of so much of a drug, toxin (biologic or non-biologic), or other chemical that a harmful effect results, such as drug overdoses. This category does not include harmful effects from normal therapeutic drugs (i.e., unexpected adverse effects to a drug administered correctly to treat a condition) or bacterial illnesses.

- 14. Struck by / against or crushed:** Injury resulting from being struck by (hit) or crushed by a human, animal, or inanimate object or force other than a vehicle or machinery; injury caused by striking (hitting) against a human, animal, or inanimate object or force other than a vehicle or machinery.
- 15. Transportation-related causes:** Injury involving modes of transportation, such as cars, motorcycles, bicycles, and trains. This category is divided into five subcategories according to the person injured: motor vehicle occupant, motorcyclist, pedal cyclist, pedestrian, and other transport. This category also involves another factor--whether the injury occurred in traffic (on a public road or highway).
- 16. Unknown/unspecified cause:** Injury for which the report does not provide enough information to describe the cause of injury.

“Injury is probably the most under recognized major public health problem facing the nation today, and the study of injury represents unparalleled opportunities for reducing morbidity and mortality and for realizing significant savings in both financial and human terms—all in return for a relatively modest investment.”

From: *Injury Prevention: Meeting the Challenge*, The National Committee for Injury

## SECTION 2: THE OVERALL BURDEN OF INJURY IN OHIO

### INJURY AS A CAUSE OF DEATH IN COMPARISON TO OTHER PUBLIC HEALTH ISSUES

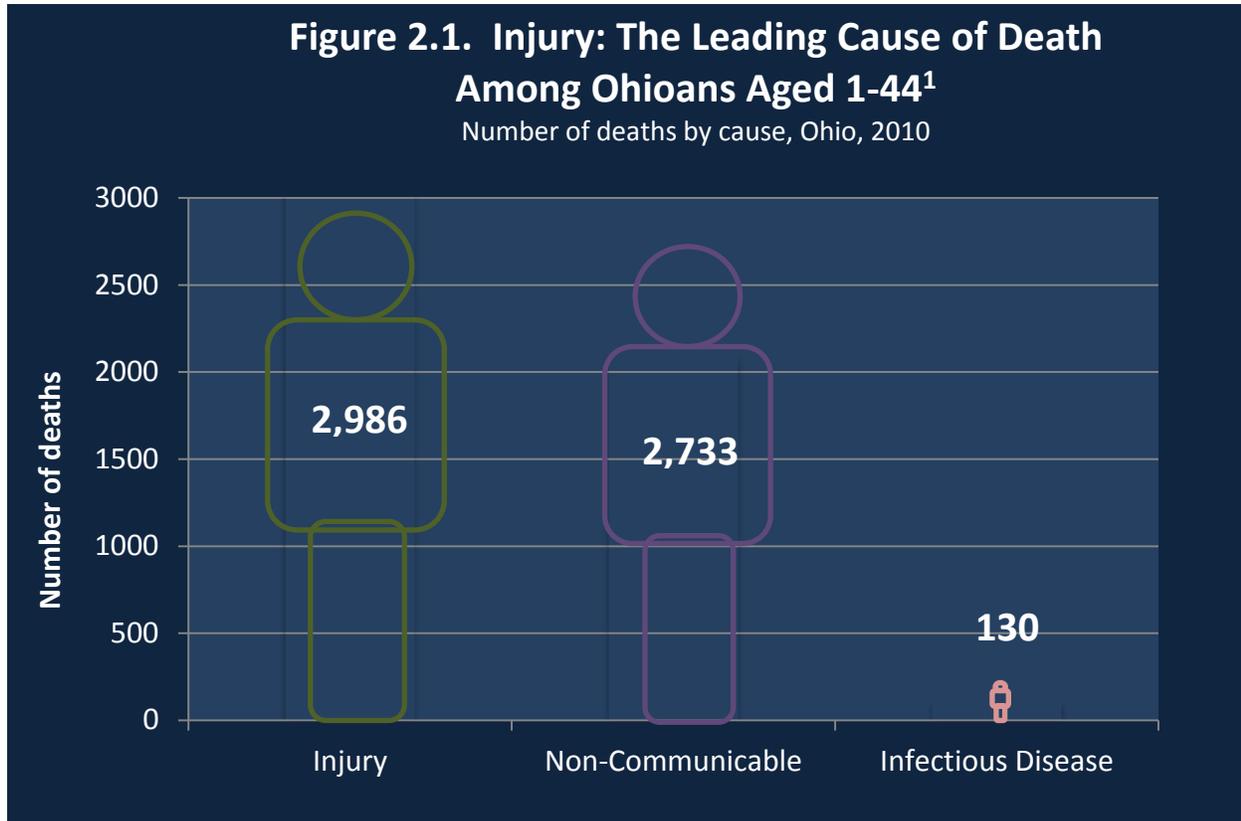
Injuries are a serious public health problem throughout the lifespan in Ohio. Injuries were consistently in the top five leading causes of death for most age groups in 2009 (Table 2.1). Unintentional injuries are the 5<sup>th</sup>-leading cause of death overall and the leading cause of death for ages 1-44. Homicides were one of the 5 leading causes of death for ages 1-9 and 15-44 while suicides were one of the 5 leading causes of death for ages 10-54.

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Short Gestation 216	Unintent. Injury 37	Unintent. Injury 15	Unintent. Injury 35	Unintent. Injury 330	Unintent. Injury 448	Malignant Neoplasm 533	Malignant Neoplasm 2,347	Malignant Neoplasm 4,691	Heart Disease 20,676	Heart Disease 25,453
2	Congenital Anomalies 209	Congenital Anomalies 15	Malignant Neoplasm 14	Malignant Neoplasm 15	Suicide 143	Suicide 168	Unintent. Injury 509	Heart Disease 1,469	Heart Disease 2,722	Malignant Neoplasm 17,333	Malignant Neoplasm 25,149
3	SIDS 80	Homicide 14	Homicide ---	Suicide 14	Homicide 129	Malignant Neoplasm 147	Heart Disease 416	Unintent. Injury 681	Chronic Lower Respiratory Disease 747	Chronic Lower Respiratory Disease 5,609	Chronic Low. Respiratory Disease 6,642
4	Maternal Pregnancy Comp. 69	Malignant Neoplasm ---	Heart Disease ---	Influenza & Pneumonia ---	Malignant Neoplasm 55	Homicide 142	Suicide 227	Liver Disease 328	Diabetes Mellitus 553	Cerebrovascular 4,798	Cerebrovascular 5,576
5	Unintent. Injury 54	Heart Disease ---	Congenital Anomalies ---	Benign Neoplasm ---	Heart Disease 26	Heart Disease 116	Diabetes Mellitus 93	Suicide 274	Cerebrovascular 436	Alzheimer's Disease 3,833	Unintent. Injury 4,012

Source: CDC WISQARS

--- Number suppressed due to counts less than 10

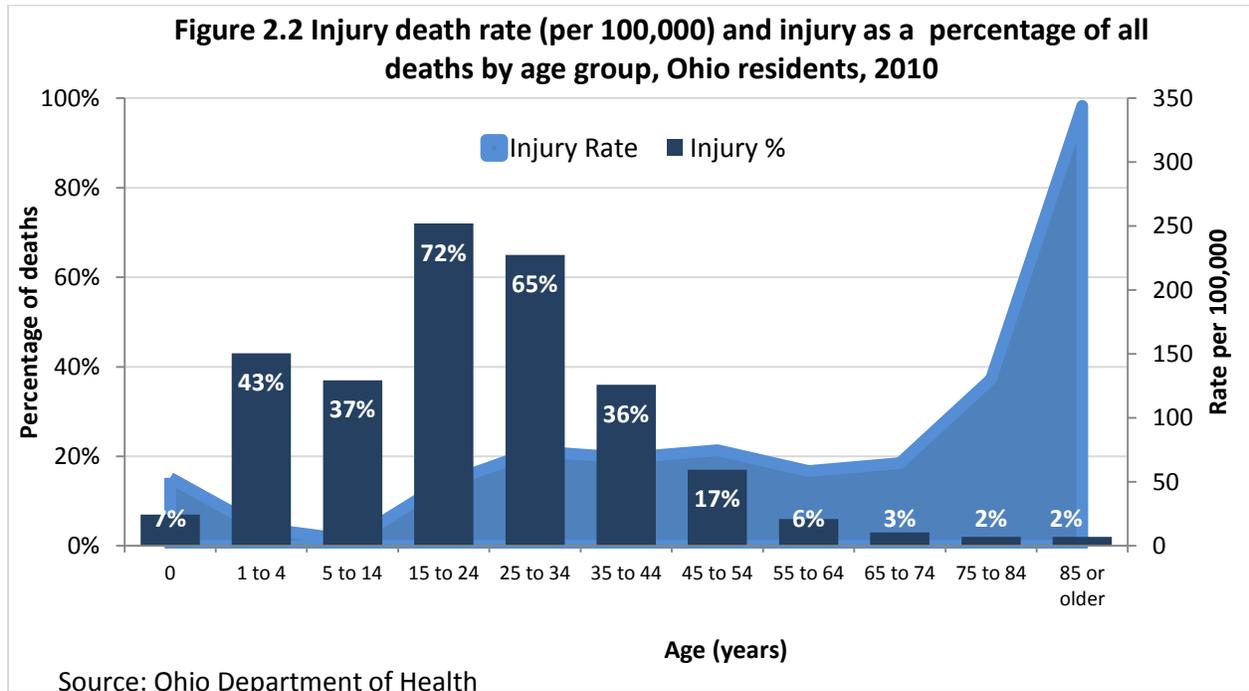
Among those aged 1 to 44, injuries caused more deaths than all infectious and non-communicable diseases (e.g., heart disease, cancer, stroke, diabetes, Alzheimer’s, liver disease, etc.) combined (see Figure 2.1).



<sup>1</sup>Source: ODH Office of Vital Statistics

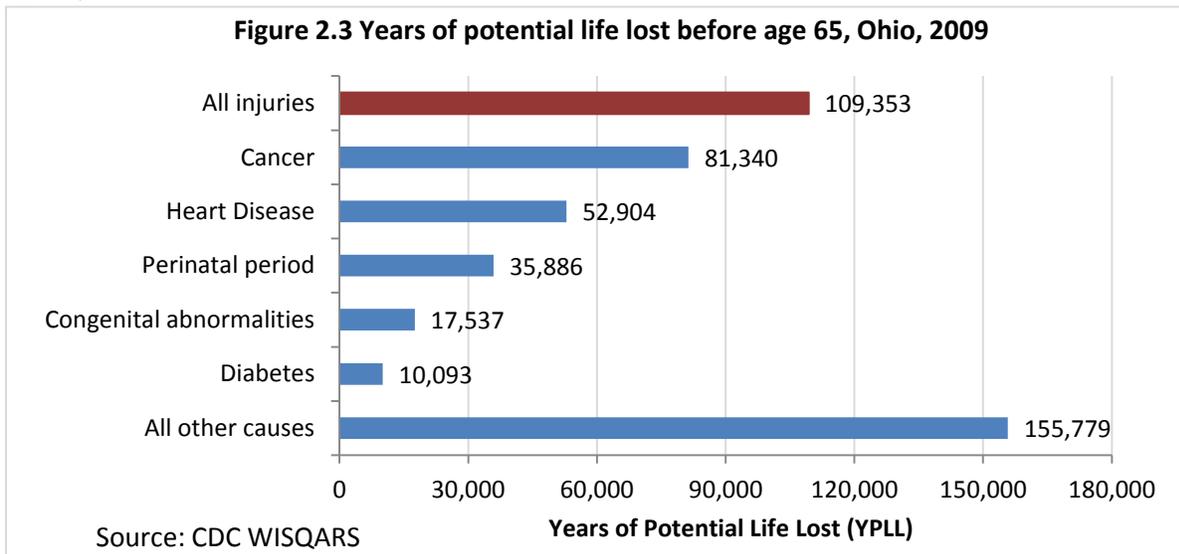
Another way to explore the burden of injury in relation to other causes of death throughout the lifespan is shown in Figure 2.2 below. This figure demonstrates the proportion of all 2010 deaths in a particular age group that were accounted for by injury. Injuries accounted for a substantial percentage of all deaths among ages 1-44. They were associated with the greatest proportion of deaths among those ages 15-34 years. For the ages 15-24, if all injury deaths were prevented, 72 percent of all deaths in this age group would be eliminated. Injuries were associated with a smaller percentage of deaths among infants less than 1 year and adults ages 45 or older. For young children ages 1 to 4 years, 43 percent of deaths were caused by injuries, and for children ages 5 to 14, more than one-third of all deaths in 2010 were injury-related. From age 25 on, the proportion of deaths due to injury steadily decreased down to 2 percent for older Ohioans as the number of deaths from chronic diseases and other causes increases.

In contrast, fatal injury rates decreased from birth through age 14 then increased from ages 15 to 34 and was similar among ages 35-74. Fatal injury rates increased dramatically among adults ages 75 or older. So while the proportion of all deaths due to injury decreases with age after 24 years, the impact of injury across the lifespan continues to be significant as death rates rise.



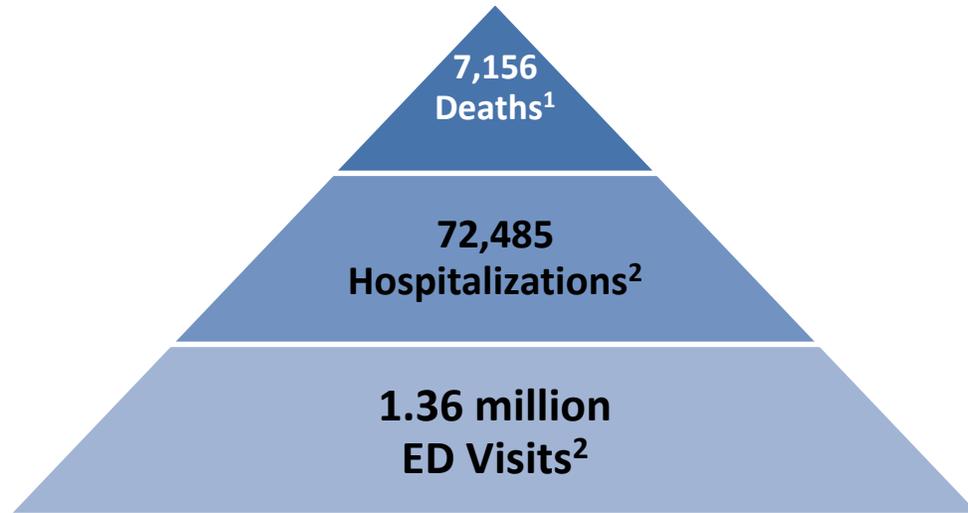
## YEARS OF POTENTIAL LIFE LOST (YPLL)

Another measure of the burden of injury is Years of Potential Life Lost (YPLL), or life lost by a premature death. YPLL involves estimating the average time a person would have lived had he or she not died prematurely. This measure is used to help quantify social and economic loss owing to premature death, especially for specific causes of death affecting younger age groups. According to the CDC WISQARS web-based query system, injuries were the leading contributor to YPLL for Ohio in 2009 (See Figure 2.3). Approximately 109,000 YPLL were attributed to all injuries. Unintentional injuries contributed 65,239 YPLL followed by suicides (24,287 years) and homicides (16,675).



## SECTION 2A: OVERVIEW OF INJURY IN OHIO

Ohio Injury Pyramid, 2010



<sup>1</sup>Source: Ohio Department of Health, Vital Statistics <sup>2</sup>Source: Ohio Hospital Association

### BURDEN OF INJURY:

Injuries are a significant public health problem in Ohio. On average in Ohio in 2010, there was more than one injury-related hospitalization every 7 minutes and an emergency department visit every 23 seconds, amounting to more than 72,000 hospitalizations and 1.36 million ED visits (Table 2.2). In addition, there was an average of nearly 20 injury-related deaths per day to Ohioans in 2010.

All injuries include unintentional causes such as motor vehicle traffic, drowning, poisoning as well as homicides and suicides.

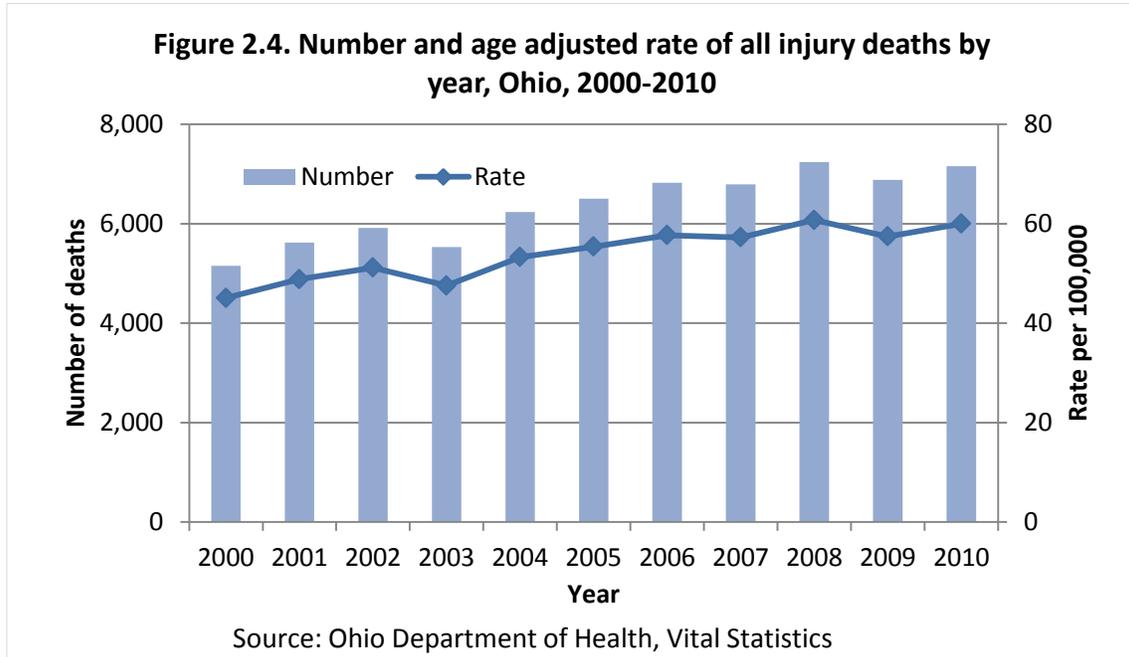
Table 2.2 Ohio Average Injury Frequency, 2010

Injury-related	Total 2010 Number	Per Day	Per Hour	Per Minute	Seconds...
ED Visits	1,360,000	3,726	155	2.6	An ED visit every 23 seconds
Hospitalizations	72,485	199	8	A hospitalization every 7 minutes	
Deaths	7,156	20	A death every 1 hour 23 minutes		

These injuries impact the state on a variety of levels. Injuries can lead to declines in physical health, well-being, and quality of life ranging from several days to many years. The large volume and treatment charges of injuries have taken a heavy toll on Ohio's health care systems. In 2010, fatal and non-fatal injuries cost Ohio \$13.4 billion in medical care and work loss. If these costs were equally divided among all Ohioans, injuries would cost every man, woman and child more than \$1,200 per year.

Fortunately injuries can be prevented through a combination of changes in individual behavior, the physical and social environment, as well as the implementation of policies aiming to reduce risk for injury.

The following sections of this report present information on specific types of injuries, the number of Ohioans affected, trends over time, and the economic impact on health care systems.



**DEATHS:**

In 2010, 7,156 Ohioans or roughly 20 per day died from an injury or violence-related cause. The death rate for injuries was 60.0 per 100,000 (see Figure 2.4). Males were more likely than females to die from an injury (82.0 versus 35.4 per 100,000). Injury fatality rates varied by age group with the highest rates found among adults ages 75 or older (see Figure 2.5). The highest fatal injury rates were found among African Americans (62.6 per 100,000) and whites (60.4 per 100,000) while lower rates were found among Hispanics (39.3 per 100,000). Table 2.3 highlights these injury risk profiles.

Table 2.3: All Injury Death Risk Profile, Ohio, 2010		
	2010 At Risk Groups	Annual trend since 2000
Overall		+33%
Sex	Males	Males (largest increase)
Age	75 or older	85 or older (largest increase)
Race and ethnicity	Blacks	Whites (largest increase)

**TRENDS:**

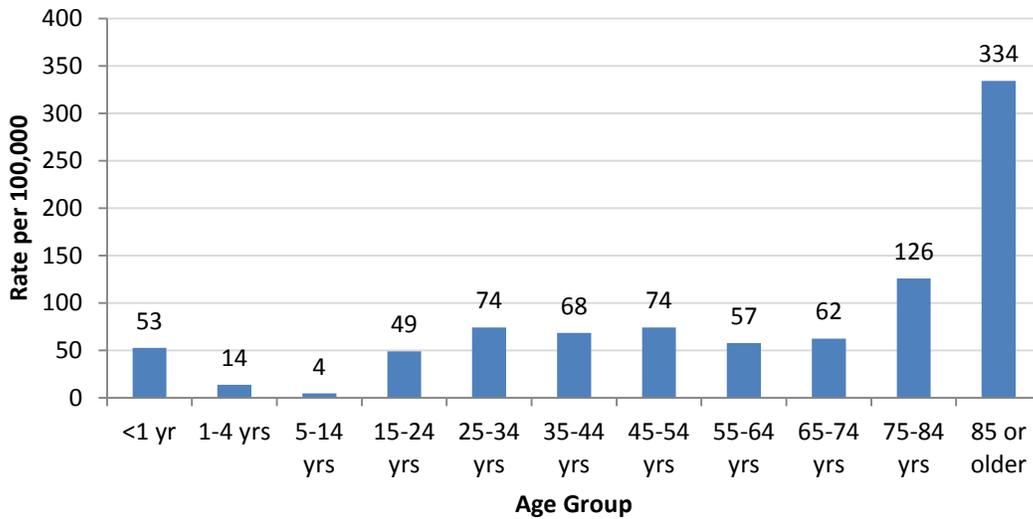
Since 2000, fatal injury rates have increased 33 percent from 45 per 100,000 in 2000 to 60 per 100,000 in 2010 (see Figure 2.4). The death rate increased by an average of 1.5 deaths per 100,000 per year. The average annual increase was greater among males (+1.7 per 100,000) than females (0.95 per 100,000). Death rates increased among most age groups, with the largest increases by age found among adults aged 85 or older (+4.5 per 100,000 per year) followed by ages 45-54 (3.2 per 100,000 per year) (see Figure 2.6).

## Burden of Injury in Ohio, 2000-2010

### Ohio Violence and Injury Prevention Program, Ohio Department of Health

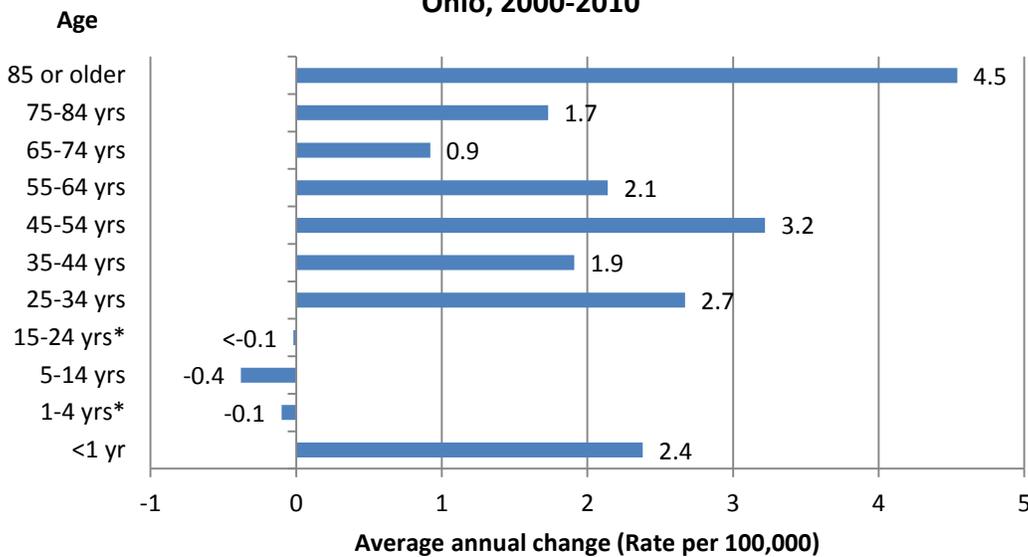
These increases are largely attributable to rising drug overdose rates and falls among older adults. A decrease in rates was found among children ages 5-14 (-0.4 per 100,000 per year). Fatal rates increased by an average of 1.6 per 100,000 per year for whites while rates remained the same for other race and ethnic groups. See tables 1a and 1b located at the end of this section for more detailed information on the number and rate of injury fatalities in Ohio.

**Figure 2.5. Rate per 100,000 for all injury deaths by age, Ohio, 2010**



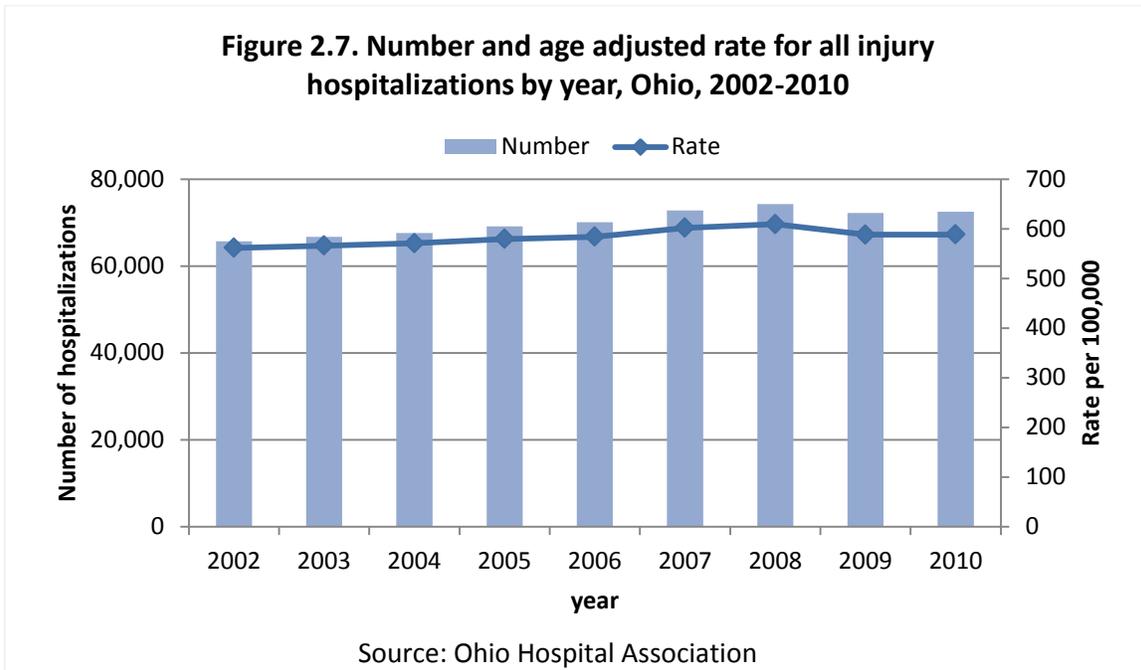
Source: Ohio Department of Health, Vital Statistics

**Figure 2.6. Average annual change in all injury death rates by age, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

\*Interpret with caution, does not follow linear trend



**HOSPITALIZATIONS:**

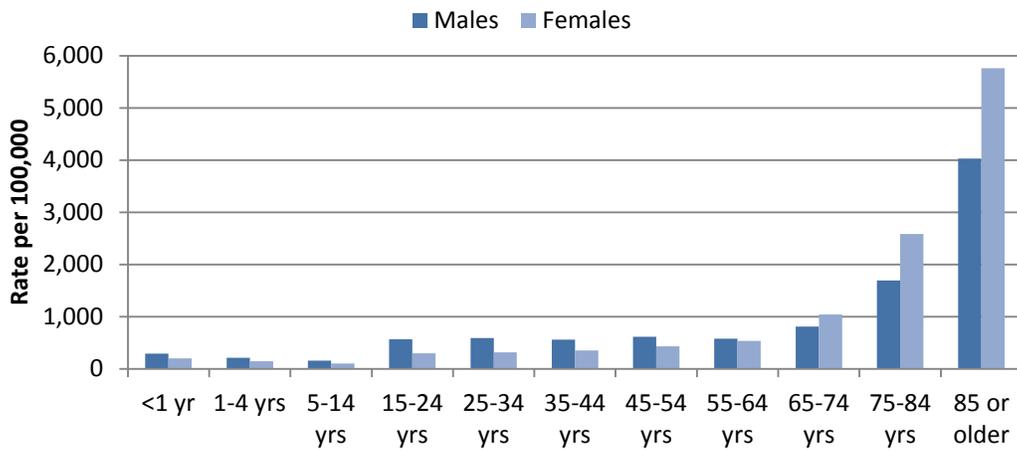
Over 72,000 hospitalizations resulted from injuries in Ohio in 2010. The injury hospitalization rate was 588 per 100,000 (Figure 2.7). Overall males (614 per 100,000) were more likely to be hospitalized for an injury than females (545 per 100,000). For both males and females, the rate of hospitalizations decreased from birth to 14 years of age and then steadily increased with age among individuals 15 or older with the highest rates found among older adults 75 or older. From birth to age 64, hospitalization rates were higher among males than females. This pattern was reversed among adults aged 65 or older with higher rates found among females (see Figure 2.8). This trend is attributable to growing rates of fall-related injury among older females. Table 2.4 highlights these injury risk profiles.

Table 2.4 All Injury Hospitalization Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		+5%
Sex	Males	Males (largest increase)
Age	75 or older	85 or older (largest increase)

**TRENDS:**

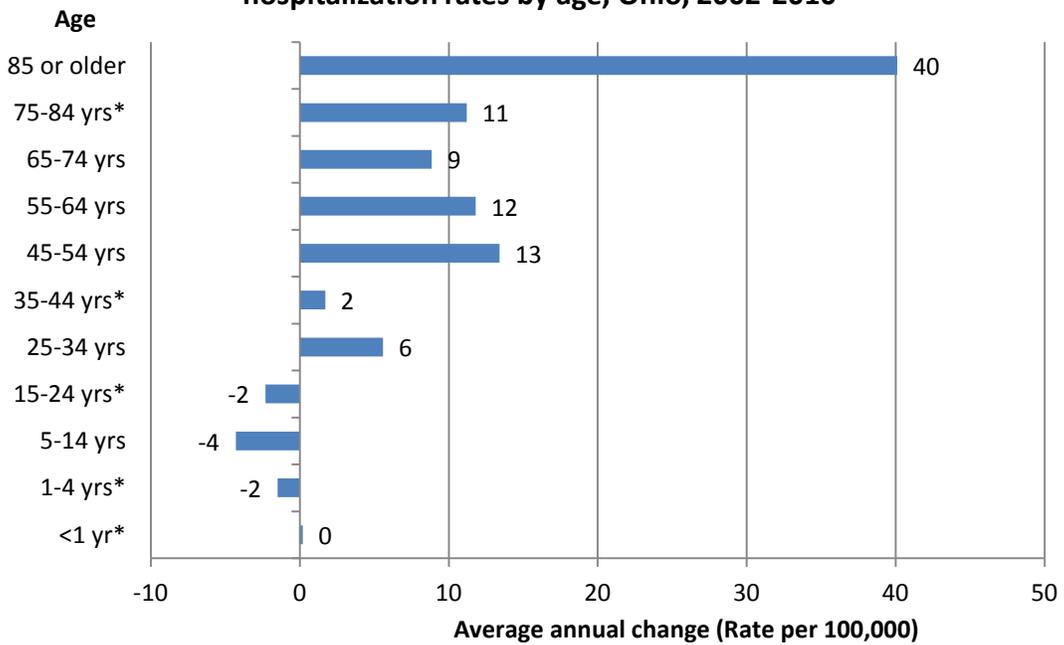
Since 2002, injury hospitalization rates have increased 5 percent from 561 per 100,000 in 2002 to 588 per 100,000 in 2010. The average increase was 4.6 hospitalizations per 100,000 per year. The average annual increase was larger among males (+5.6 per 100,000) compared to females (4.1 per 100,000). Injury hospitalization rates increased among most age groups with the largest increase found among adults ages 85 or older (40 per 100,000 per year). A decrease in hospitalization rates occurred among children ages 5-14 (-4 per 100,000) while rates among children 4 years or less, ages 15-24 and 35-44 did not follow a linear trend (see Figure 2.9). See Tables 2a and 2b for more detailed information located at the end of this section on the number and rate of all injury hospitalizations.

**Figure 2.8. Rates for all injury hospitalizations by age and sex, Ohio, 2010**



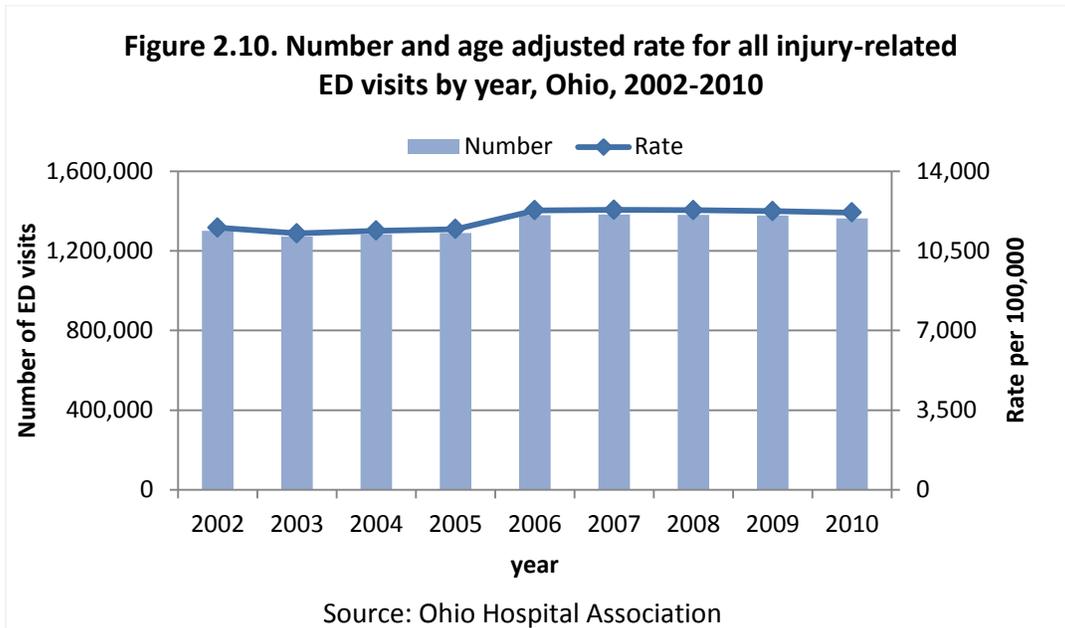
Source: Ohio Hospital Association

**Figure 2.9. Average annual change in all injury hospitalization rates by age, Ohio, 2002-2010**



Source: Ohio Hospital Association

\*Interpret with caution, does not follow linear trend



**EMERGENCY DEPARTMENT VISITS:**

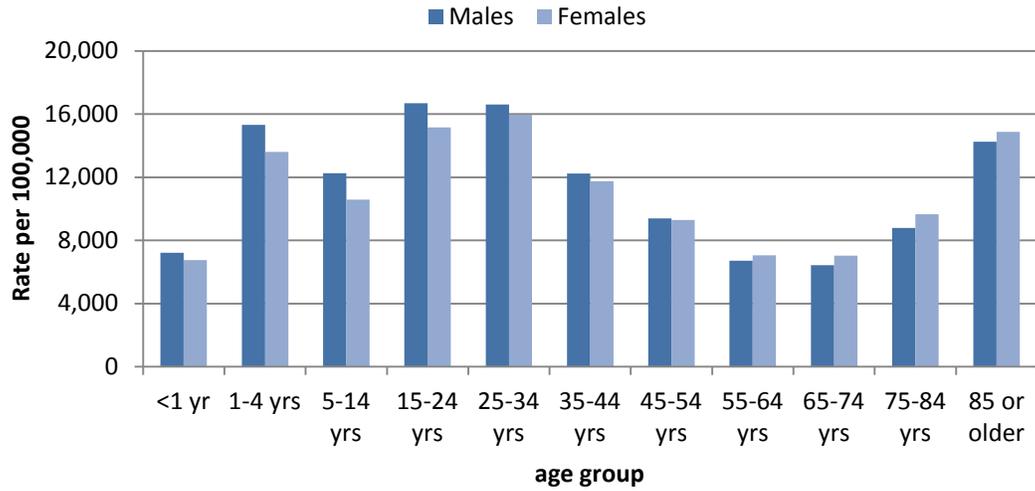
Nearly 1.36 million emergency department visits resulted from injuries in 2010. The injury ED visit rate was 12,181 per 100,000 (see Figure 2.10). The rate of ED visits was slightly higher among males compared to females (12,739 versus 11,567 per 100,000). ED visit rates increased with age from birth through age 34, steadily decreased from ages 35 to 64, and subsequently increased among adults 65 or older. From birth to age 54, ED visit rates were higher among males than females. This pattern was reversed among adults aged 55 or older with higher rates found among females (see Figure 2.11) due to higher rates of fall-related injury among older females. Table 2.4 highlights these injury risk profiles.

Table 2.4 All Injury ED Visit Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		+8%
Sex	Males	Females (largest increase)
Age	15-34	85 or older (largest increase)

**TRENDS:**

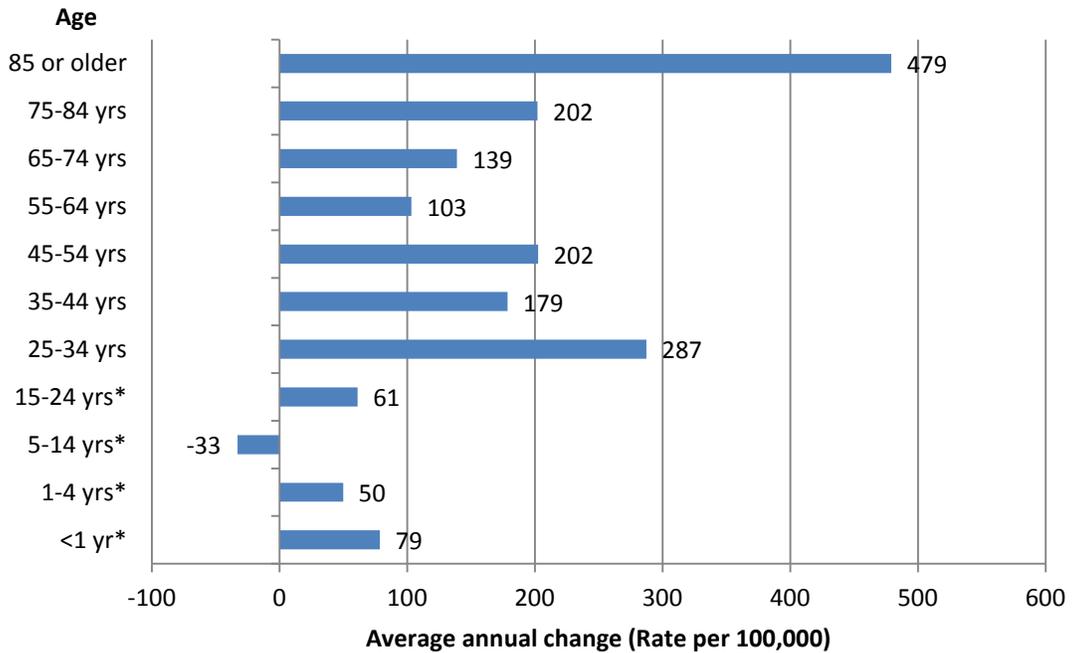
Injury ED visit rates resulting from all injuries increased 8 percent from 11,518 per 100,000 in 2002 to 12,495 in 2010. The average annual increase was 137 per 100,000 per year. The average annual increase was 185 per 100,000 among females while the trend for males did not follow a linear pattern. ED visit rates increased among almost all age groups with the largest increase found among adults aged 85 or older (479 per 100,000) (see Figure 2.12). See Tables 3a and 3b located at the end of this section for more detailed information on the number and rate of all injury ED visits.

Figure 2.11. Rates for all injury ED visits by age and sex, Ohio, 2010



Source: Ohio Hospital Association

Figure 2.12. Average annual changes in all injury ED visit rates by age, Ohio, 2002-2010



Source: Ohio Hospital Association

\*Does not follow a linear trend

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 1a. Number of deaths resulting from all injuries, by year, Ohio, 2000-2010**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	5,150	5,618	5,916	5,532	6,233	6,503	6,824	6,790	7,237	6,880	7,156
<b>Sex</b>											
Males	3,474	3,785	3,952	3,711	4,238	4,331	4,541	4,567	4,803	4,558	4,750
Females	1,676	1,833	1,964	1,821	1,995	2,172	2,283	2,223	2,434	2,322	2,406
<b>Age</b>											
< 1 yr	46	68	65	68	68	83	80	83	98	90	73
1-4 yrs	93	79	56	91	70	67	58	74	73	72	80
5-14 yrs	169	111	124	114	120	123	130	71	95	85	68
15-24 yrs	707	769	822	813	907	867	834	860	786	703	774
25-34 yrs	660	725	782	751	787	869	937	929	977	959	1,043
35-44 yrs	916	991	1,023	837	965	1,018	1,031	1,059	1,100	1,018	1,012
45-54 yrs	693	862	892	797	1,077	1,084	1,254	1,230	1,312	1,311	1,290
55-64 yrs	383	423	480	435	548	606	683	690	780	773	835
65-74 yrs	387	415	427	381	424	423	417	426	483	471	531
75-84 yrs	584	659	644	627	679	688	678	662	743	670	680
85 or older	512	516	601	618	588	675	722	706	790	728	770
<b>Race and ethnicity</b>											
White‡	4,349	4,714	4,975	4,627	5,196	5,404	5,702	5,687	6,096	5,786	6,088
Black‡	701	782	783	769	859	928	996	944	974	944	890
Hispanic	60	79	90	90	109	106	80	108	124	108	114
Other‡	28	35	33	22	35	34	32	41	36	38	57

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 1b. Death rates per 100,000 resulting from all injuries, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	45.0	48.8	51.1	47.5	53.3	55.4	57.7	57.2	60.7	57.4	60.0	1.5
<b>Sex†</b>												
Males	66.3	71.5	74.3	69.2	78.2	79.5	82.6	82.9	86.9	81.8	82.0	1.7
Females	26.3	28.6	30.6	27.9	30.7	33.3	34.6	33.6	36.7	35.1	35.4	1.0
<b>Age</b>												
< 1 yr	30.7	44.3	44.2	46.1	45.6	56.7	54.0	54.7	64.2	60.9	52.5	2.4
1-4 yrs	15.4	13.2	9.3	15.2	11.8	11.3	9.9	12.6	12.3	12.2	13.8	-0.1 (NL)
5-14 yrs	10.3	6.8	7.7	7.1	7.6	7.9	8.5	4.7	6.3	5.7	4.5	-0.4
15-24 yrs	45.5	49.0	51.9	51.0	56.8	54.4	52.7	54.6	50.0	44.9	48.8	-0.02 NL
25-34 yrs	43.6	48.6	53.0	51.2	53.9	59.6	64.3	63.6	66.8	64.9	74.0	2.7
35-44 yrs	50.8	55.7	58.6	49.0	57.6	61.8	63.5	66.5	70.7	67.0	68.4	1.9
45-54 yrs	44.0	52.8	54.2	47.7	63.5	63.1	72.2	70.4	74.9	74.7	74.0	3.2
55-64 yrs	37.8	41.3	44.3	38.7	46.9	49.9	54.3	53.1	58.5	55.8	57.5	2.1
65-74 yrs	49.1	53.2	55.4	49.6	55.2	55.2	54.2	54.5	59.8	56.4	62.5	0.9
75-84 yrs	107.7	120.1	116.4	112.8	122.2	124.1	123.4	121.9	138.9	123.6	125.6	1.7
85 or older	288.1	284.9	318.2	315.4	293.3	326.1	336.1	317.3	345.5	320.1	334.2	4.5
<b>Race and ethnicity†</b>												
White‡	43.9	47.3	49.8	46.2	51.6	53.6	56.2	56.1	59.8	56.8	60.4	1.6
Black‡	55.9	60.9	60.5	58.8	65.5	69.1	73.6	69.4	71.6	68.8	62.6	1.16 (NL)
Hispanic	32.7	44.6	45.1	47.4	43.5	45.5	32.6	40.2	45.2	38.2	39.3	-0.16 (NL)
Other‡	21.6	22.7	20.7	13.8	21.3	19.9	16.7	21.0	19.0	18.3	27.2	0.14 (NL)

†Rates age-adjusted to 2000 U.S. standard population  
Source: Ohio Department of Health, Office of Vital Statistics

‡Non-Hispanic

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 2a. Number of hospitalization resulting from all injuries, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	65,657	66,738	67,628	69,119	70,096	72,775	74,231	72,233	72,485
<b>Sex</b>									
Males	30,540	31,005	31,574	32,279	32,757	34,199	34,478	33,687	34,060
Females	35,117	35,733	36,054	36,840	37,339	38,576	39,753	38,546	38,425
<b>Age</b>									
< 1 yr	381	374	367	390	376	369	395	407	340
1-4 yrs	1,238	1,186	1,224	1,096	1,123	1,115	1,179	1,224	1,037
5-14 yrs	2,753	2,702	2,609	2,434	2,349	2,355	2,295	2,159	1,990
15-24 yrs	7,176	7,253	7,188	7,420	7,446	7,308	6,931	6,971	6,837
25-34 yrs	5,942	5,970	6,070	6,145	6,319	6,590	6,500	6,266	6,378
35-44 yrs	7,701	7,489	7,579	7,555	7,297	7,401	7,111	6,839	6,735
45-54 yrs	6,888	7,315	7,671	8,167	8,270	8,983	9,235	8,882	9,083
55-64 yrs	5,090	5,580	5,811	6,271	6,552	7,067	7,627	7,698	8,104
65-74 yrs	6,664	6,826	6,787	6,955	6,919	7,393	7,819	7,538	7,948
75-84 yrs	12,178	12,425	12,448	12,439	12,640	12,755	13,142	12,230	12,009
85 or older	9,646	9,618	9,874	10,247	10,805	11,439	11,997	12,019	12,024

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 2b. Hospitalization rates resulting from all injuries, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	561	566	571	580	584	602	609	588	588	4.6
<b>Sex†</b>										
Males	579	582	590	599	604	627	629	613	614	5.6
Females	521	527	530	538	540	554	568	545	545	4.1
<b>Age</b>										
< 1 yr	259	254	246	266	254	243	259	276	245	0.2 (NL)
1-4 yrs	206	198	206	184	191	190	199	207	178	-1.5 (NL)
5-14 yrs	170	169	165	157	153	155	153	144	131	-4.3
15-24 yrs	454	455	450	466	471	464	441	445	431	-2.3 (NL)
25-34 yrs	403	407	415	422	434	451	444	424	452	5.6
35-44 yrs	441	439	452	459	450	464	457	450	455	1.7 (NL)
45-54 yrs	418	437	452	476	476	514	527	506	521	13.4
55-64 yrs	470	496	497	517	521	544	572	555	558	11.8
65-74 yrs	864	888	884	908	899	945	969	902	935	8.9
75-84 yrs	2,201	2,235	2,240	2,244	2,300	2,350	2,456	2,256	2,218	11.2 (NL)
85 or older	5,107	4,908	4,926	4,951	5,030	5,141	5,247	5,285	5,218	40.1

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 3a. Number of ED visits resulting from all injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	1,300,058	1,271,812	1,283,535	1,289,019	1,379,288	1,382,187	1,379,696	1,377,385	1,362,301
<b>Sex</b>									
Males	694,087	675,119	681,182	681,895	728,084	725,604	717,694	707,396	698,758
Females	605,971	596,693	602,353	607,124	651,204	656,583	662,002	669,989	663,513
<b>Age</b>									
< 1 yr	10,428	10,089	10,122	9,832	10,982	10,714	10,945	11,629	10,025
1-4 yrs	91,108	88,351	87,475	84,207	91,046	86,098	86,870	90,837	89,206
5-14 yrs	208,318	199,556	197,444	189,549	202,428	190,240	186,884	187,702	186,672
15-24 yrs	269,397	260,896	263,584	265,353	280,877	276,797	271,514	269,321	264,793
25-34 yrs	216,218	208,472	212,274	216,734	230,195	236,084	235,763	234,654	234,167
35-44 yrs	196,680	187,237	186,762	186,606	195,211	195,817	190,740	185,028	181,242
45-54 yrs	133,765	136,456	140,012	145,935	157,683	164,036	166,988	164,248	163,625
55-64 yrs	66,400	70,482	74,207	76,904	84,799	90,083	93,807	95,456	97,488
65-74 yrs	43,720	44,637	45,072	45,964	49,774	52,840	55,033	55,968	54,605
75-84 yrs	42,983	43,671	44,085	44,526	48,877	49,989	49,792	49,960	47,630
85 or older	21,041	21,965	22,498	23,409	27,416	29,489	31,360	32,582	32,848

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 3b. ED visit rate per 100,000 resulting from all injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	11,518	11,265	11,383	11,450	12,278	12,297	12,283	12,245	12,181	137.3
<b>Sex†</b>										
Males	12,482	12,146	12,275	12,311	13,179	13,142	13,013	12,821	12,739	89.3 (NL)
Females	10,497	10,326	10,438	10,536	11,314	11,392	11,495	11,612	11,567	185.1
<b>Age</b>										
< 1 yr	7,086	6,845	6,782	6,711	7,412	7,067	7,173	7,872	7,210	78.6 (NL)
1-4 yrs	15,140	14,773	14,688	14,169	15,508	14,645	14,695	15,349	15,332	48.9 (NL)
5-14 yrs	12,896	12,484	12,504	12,199	13,188	12,557	12,487	12,561	12,260	-33.1 (NL)
15-24 yrs	17,025	16,357	16,519	16,658	17,755	17,582	17,275	17,210	16,687	60.7 (NL)
25-34 yrs	14,655	14,217	14,528	14,871	15,806	16,156	16,110	15,874	16,608	287.2
35-44 yrs	11,267	10,971	11,145	11,325	12,032	12,288	12,261	12,174	12,247	178.5
45-54 yrs	8,127	8,160	8,255	8,497	9,078	9,386	9,536	9,363	9,392	202.4
55-64 yrs	6,129	6,263	6,349	6,337	6,747	6,936	7,039	6,887	6,713	103.1
65-74 yrs	5,667	5,806	5,873	6,001	6,470	6,755	6,818	6,696	6,422	138.9
75-84 yrs	7,770	7,855	7,932	8,033	8,894	9,208	9,307	9,216	8,798	202.0
85 or older	11,139	11,209	11,224	11,310	12,762	13,252	13,715	14,327	14,255	479.1

†Rates are age adjusted to 2000 U.S. standard population  
Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

## INJURY MECHANISM

Table 2.6 provides the leading mechanisms for fatal injuries and injuries treated as hospital inpatient care and in the emergency department in 2010. Poisoning, falls, transportation, firearms, and suffocation were the leading causes of injury death for Ohioans of all ages.

Of non-fatal injuries with an external cause of injury code (E-Code), falls, poisoning, transportation, struck by or against, and firearms were leading causes of injury hospitalization while falls, struck by or against, transportation, overexertion, and cut/pierce were the leading causes of injury treated in emergency departments.

Please note that these data include all intents (i.e., unintentional, homicide, suicide, undetermined). Intent will be specified in later sections of the report.

**External Cause of Injury Coding (E-Code) Limitations**

A substantial percentage of hospital inpatient (38%) and emergency department (26%) records did not list an external cause mechanism. This missing information is an important limitation to our ability to accurately describe the burden of injuries in Ohio by mechanism and to design efforts to prevent injuries from occurring in the future.

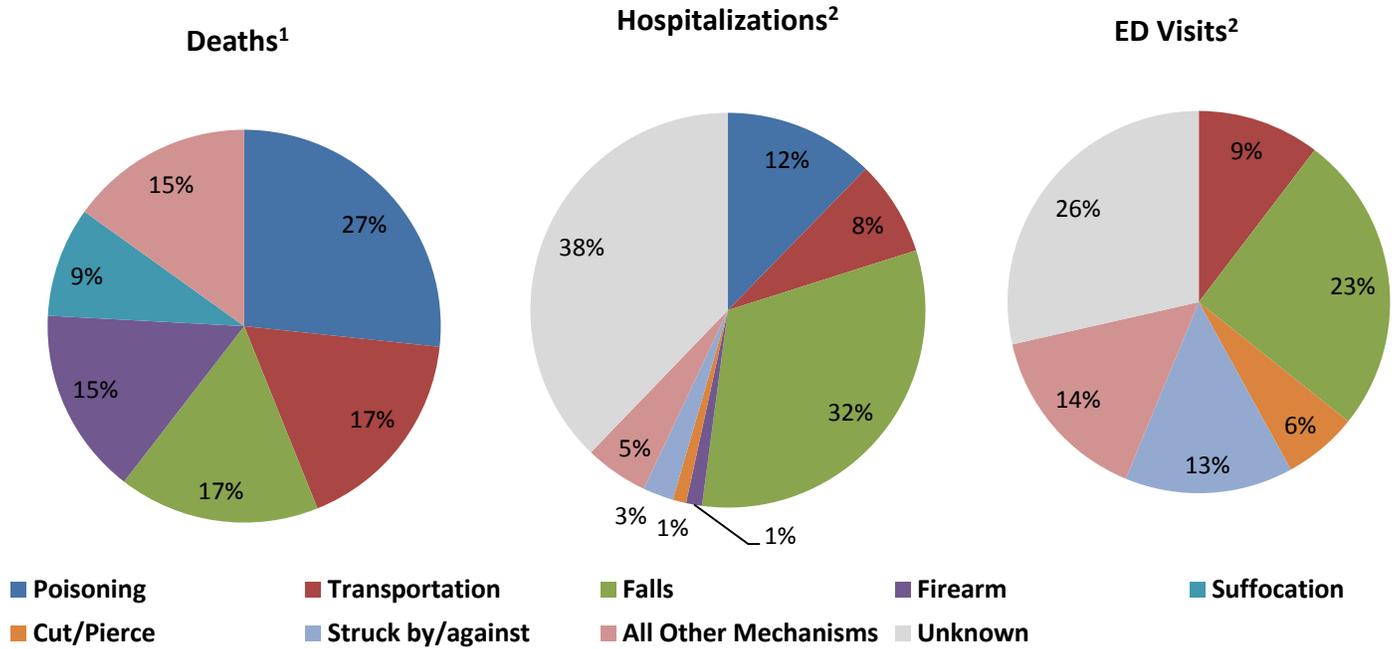
**Table 2.6: Leading Causes of Injury Death<sup>1</sup>, Hospitalization<sup>2</sup> and ED Visits<sup>2</sup> by Mechanism, Ohio, 2010**

RANK	DEATHS <sup>1</sup> 2010	HOSPITALIZATIONS <sup>2</sup> 2010	ED VISITS <sup>2</sup> 2010
1	Poisoning (27.4%)	Falls (32.0%)	Falls (23.2%)
2	Transportation (17.7%)	Poisoning (12.3%)	Struck by/against (12.9%)
3	Falls (16.5%)	Transportation (7.8%)	Transportation (9.4%)
4	Firearm (15.8%)	Struck by/against (2.5%)	Overexertion (9.1%)
5	Suffocation (9.3%)	Firearm (1.3%)	Cut/Pierce (5.7%)
6	Not specified (4.5%)	Cut/Pierce (1.1%)	Other specified (3.2%)
	All other mechanisms (11.0%)	All other mechanisms (5.2%)	All other mechanisms (10.6%)
<b>MISSING E-CODE</b>		37.8%	25.9%

Sources: 1 ODH Office of Vital Statistics, 2 Ohio Hospital Association

Figure 2.13 presents this same information in chart format. The chart format clearly illustrates the problem of missing E-codes in hospital and ED data where the mechanism of injury is simply missing in more than one-third of the hospitalized injuries and more than one-fourth of the ED visits.

**Figure 2.13. Leading Causes of Injury-related Death, Hospitalization, and ED Visits by Mechanism, Ohio, 2010**



Sources: 1 ODH Office of Vital Statistics, 2 Ohio Hospital Association

## **INJURY ACROSS THE LIFESPAN**

Age is a significant factor affecting the occurrence, severity and type of injury. As demonstrated in the table below, risk for different type of injury varies across the lifespan.

### **YOUNG OHIOANS:**

Injury is the leading cause of death and disability for children. Their dynamic cognitive and development abilities play a significant role in their vulnerability to injury.

While fatal injury risk varies greatly as children age (see Table 2.7), non-fatal risk is much less variable. Falls are the leading cause of non-fatal (ED and hospitalizations) injury for children birth to age 9. Falls remain the leading cause of injury-related hospitalization through age 15 when self-harm and motor vehicle traffic crashes surpass them. Falls remain the 2<sup>nd</sup>-leading cause of injury-related ED visits from ages 10 to 24.

#### **Infants**

During the first year of life, risk of death due to injury is higher than any other age group until age 24 (Figure 2.2). Suffocation and homicide are the leading causes of injury death to infants while falls and assault lead to the most injury-related hospitalizations. Falls and unintentional struck by/against cause the greatest number of injury-related ED visits among Ohio infants.

#### **Children**

For young children ages 1 to 4, homicide, drowning, motor vehicle traffic and fire/burn are the leading causes of injury death in Ohio. As described above, falls are the leading cause of injury-related hospitalization and ED visits for young children. Poisoning and fire/burn are the 2<sup>nd</sup>- and 3<sup>rd</sup>-leading causes of injury-related hospitalizations, respectively for this age group. Struck by/against is the 2<sup>nd</sup> cause of injury-related ED visits.

For children ages 5 to 9, motor vehicle traffic and homicide are the two leading causes of injury death. Falls are the leading cause of non-fatal injury for both ED visits and hospitalizations. Motor vehicle traffic crashes are the 2<sup>nd</sup>-leading causes of injury-related hospitalizations and struck by/against is the second leading cause of injury related ED visits.

#### **Teens and Young Adults**

For ages 10-24, motor vehicle traffic crashes remain the leading cause of injury-related death followed by suicide and then homicide. Self-harm, motor vehicle traffic crashes and falls are the three-leading causes of injury-related hospitalization in order. Struck-by against followed by falls are the leading causes of injury-related ED visits for ages 10 -24.

## ADULTS

Adults have significant risks for injury. Over the past decade, rates have been increasing largely due to the prescription drug abuse epidemic leading to fatal drug overdoses. For ages 25 – 54, unintentional poisoning (drug overdose), suicide and motor vehicle traffic cause the most injury fatalities. Most injury-related hospitalizations are caused by self-harm, falls and motor vehicle traffic among this age group. Falls, overexertion and struck-by/against are the three-leading causes of injury-related ED visits.

For ages 55-64, suicide emerges as the leading cause of injury death. Falls and motor vehicle traffic are the two-leading causes for non-fatal injury-related hospitalizations and ED visits.

## OLDER ADULTS

Older adults have the highest rates of injury death. As with children, anatomical, physiological and cognitive changes help to explain the heightened risk. Sight, balance and coordination wane with age leading to an increased risk for falls. In addition, increasing use of medications and possible drug interactions may also be a risk factor for falls. Falls are the leading cause of injury-related death, hospitalization and ED visits for older Ohioans aged 65 and older. In 2010, older adults accounted for 14 percent of Ohio’s population while accounting for 82 percent of the fatal falls.

Reaction times increase leading to risk for motor vehicle crashes, the 2<sup>nd</sup>-leading cause of injury-related death, hospitalization and ED visits. Poor sight or decreased mental capacity and memory may lead to unintentional drug overdoses or poisonings. In addition, physical changes may lead to greater severity of injury and less resiliency.

Older adults may also be socially isolated and depressed leading to risk for substance abuse or self-harm/suicide.

Table 2.7 provides a detailed listing of leading causes of fatal and non-fatal injury by intent, mechanism and age group.

Leading Causes of Injury by Age Group Summary, Ohio, 2006-10

Age Group	Fatal <sup>1</sup>	Non-fatal <sup>2</sup>
Infants (< 1 year)	Suffocation*	Falls*
Toddlers (1-4 years)	Homicide	Falls*
Children (5 to 9 years)	Motor vehicle traffic*	Falls*
Tweens to Young Adults (10-24 years)	Motor vehicle traffic*	Struck-by/against* (e.g., in sports)
Adults (25 – 64 years)	Poisoning*	Falls*
Older Adults (65+)	Falls*	Falls*

Sources: 1 ODH Office of Vital Statistics  
2 Ohio Hospital Association

\*Unintentional

## Burden of Injury in Ohio, 2000-2010

Table 2.7 Leading causes of injury deaths<sup>1</sup> by intent<sup>2</sup>; inpatient hospitalizations<sup>3</sup> and ED visits<sup>3</sup> by age-group, Ohio, 2008-2010

Age Group	Deaths by Mechanism (Unintentional, Intentional and Undetermined Intent)	Deaths by Intent (Unintentional unless Homicide/Suicide)	Inpatient Hospitalizations	Emergency Department Visits
It 1	<ol style="list-style-type: none"> <li>1. Suffocation (176)</li> <li>2. Other specified (22)</li> <li>3. Not specified (18)</li> <li>4. MV Traff (17)</li> </ol>	<ol style="list-style-type: none"> <li>1. Suffocation (164)</li> <li>2. Homicide (43)</li> <li>3. Undetermined (18)</li> <li>4. MV Traffic (15)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (206)</li> <li>2. Assault (191)</li> <li>3. Fire/burn (71)</li> <li>4. Other specified and poisoning (43 each)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (11,352)</li> <li>2. Struck by/against (2,652)</li> <li>3. MV Traffic (1,721)</li> <li>4. Other specified (1,273)</li> </ol>
1-4	<ol style="list-style-type: none"> <li>1. Drowning (42)</li> <li>2. Fire/burn (36)</li> <li>3. MV Traffic (33)</li> <li>4. Other specified (18)</li> </ol>	<ol style="list-style-type: none"> <li>1. Homicide (56)</li> <li>2. Drowning (39)</li> <li>3. MV Traffic (33)</li> <li>4. Fire/burn (27)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (625)</li> <li>2. Poisoning (539)</li> <li>3. Fire/burn (287)</li> <li>4. Other specified (156)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (77,975)</li> <li>2. Struck by/agnst (31,241)</li> <li>3. Other Specified (16,351)</li> <li>4. Ntl Environment (15,711)</li> </ol>
5-9	<ol style="list-style-type: none"> <li>1. MV Traffic (28)</li> <li>2. Fire/Burn (16)</li> <li>3. Drowning (13)</li> <li>4. Firearm (12)</li> </ol>	<ol style="list-style-type: none"> <li>1. MV Traffic (28)</li> <li>2. Homicide (17)</li> <li>3. Fire/burn (16)</li> <li>4. Drowning (13)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (674)</li> <li>2. MV Traffic (275)</li> <li>3. Pedal Cycle (175)</li> <li>4. Struck by/against (131)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (59,595)</li> <li>2. Struck by/agnst (38,290)</li> <li>3. Ntl Environment (14,085)</li> <li>4. Cut/pierce (13,184)</li> </ol>
10-14	<ol style="list-style-type: none"> <li>1. MV Traffic (46)</li> <li>2. Suffocation (39)</li> <li>3. Drowning (18)</li> <li>4. Firearm (15)</li> </ol>	<ol style="list-style-type: none"> <li>1. MV Traffic (46)</li> <li>2. Suicide (35)</li> <li>3. Drowning (18)</li> <li>4. Homicide (15)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (561)</li> <li>2. MV Traffic (321)</li> <li>3. Struck by/against (283)</li> <li>1. Self-harm (273)</li> </ol>	<ol style="list-style-type: none"> <li>1. Struck by/angst (68,364)</li> <li>2. Falls (64,416)</li> <li>3. Overexertion (26,062)</li> <li>4. Cut/pierce (15,705)</li> </ol>
15-19	<ol style="list-style-type: none"> <li>1. MV Traffic (326)</li> <li>2. Firearms (235)</li> <li>3. Suffocation (113)</li> <li>4. Poisoning (89)</li> </ol>	<ol style="list-style-type: none"> <li>1. MV Traffic (326)</li> <li>2. Suicide (217)</li> <li>3. Homicide (155)</li> <li>4. Poisoning (73)</li> </ol>	<ol style="list-style-type: none"> <li>1. Self-harm (1,921)</li> <li>2. MV Traffic (1,469)</li> <li>3. Assault (816)</li> <li>4. Falls (591)</li> </ol>	<ol style="list-style-type: none"> <li>1. Struck by/angst (65,976)</li> <li>2. Falls (52,439)</li> <li>3. MV Traffic (39,633)</li> <li>4. Overexertion (37,018)</li> </ol>
20-24	<ol style="list-style-type: none"> <li>1. Firearms (414)</li> <li>2. MV Traffic (365)</li> <li>3. Poisoning (342)</li> <li>4. Suffocation (136)</li> </ol>	<ol style="list-style-type: none"> <li>1. MV Traffic (365)</li> <li>2. Suicide (316)</li> <li>3. Poisoning (301)</li> <li>4. Homicide (296)</li> </ol>	<ol style="list-style-type: none"> <li>1. Self-harm (1,891)</li> <li>2. MV Traffic (1,648)</li> <li>3. Assault (1,393)</li> <li>4. Falls (684)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (55,998)</li> <li>2. MV Traffic (43,332)</li> <li>3. Struck by/agst (40,876)</li> <li>4. Overexertion (40,462)</li> </ol>
25-34	<ol style="list-style-type: none"> <li>1. Poisoning (1,145)</li> <li>2. Firearm (668)</li> <li>3. MV Traffic (524)</li> <li>4. Suffocation (284)</li> </ol>	<ol style="list-style-type: none"> <li>1. Poisoning (1,017)</li> <li>2. Suicide (667)</li> <li>3. MV Traffic (486)</li> <li>4. Homicide (271)</li> </ol>	<ol style="list-style-type: none"> <li>2. Self-harm (3,537)</li> <li>3. MV Traffic (2,326)</li> <li>4. Assault (1,875)</li> <li>5. Falls (1,665)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (111,034)</li> <li>2. Overexertion (86,778)</li> <li>3. Struck by/angst (65,054)</li> <li>4. MV Traffic (63,363)</li> </ol>
35-44	<ol style="list-style-type: none"> <li>1. Poisoning (1,409)</li> <li>2. Firearms (538)</li> <li>3. MV Traffic (486)</li> <li>4. Suffocation (264)</li> </ol>	<ol style="list-style-type: none"> <li>1. Poisoning (1,173)</li> <li>2. Suicide (800)</li> <li>3. MV Traffic (702)</li> <li>4. Homicide (419)</li> </ol>	<ol style="list-style-type: none"> <li>1. Self-harm (3,772)</li> <li>2. Falls (2,641)</li> <li>3. MV Traffic (2,208)</li> <li>4. Assault (1,280)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (101,490)</li> <li>2. Overexertion (68,302)</li> <li>3. MV Traffic (47,134)</li> <li>4. Struck by/against (46,653)</li> </ol>
45-54	<ol style="list-style-type: none"> <li>1. Poisoning (1,757)</li> <li>2. MV Traffic (579)</li> <li>3. Firearms (574)</li> <li>4. Suffocation (290)</li> </ol>	<ol style="list-style-type: none"> <li>1. Poisoning (1,451)</li> <li>2. Suicide (955)</li> <li>3. MV Traffic (579)</li> <li>4. Homicide (229)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (5,496)</li> <li>2. Self-Harm (3,469)</li> <li>3. MV Traffic (2,358)</li> <li>4. Poisoning (1,758)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (111,481)</li> <li>2. Overexertion (68,794)</li> <li>3. MV Traffic (40,918)</li> <li>4. Struck by/against (36,319)</li> </ol>
55-64	<ol style="list-style-type: none"> <li>1. Poisoning (706)</li> <li>2. MV Traffic (431)</li> <li>3. Firearms (404)</li> <li>4. Fall (283)</li> </ol>	<ol style="list-style-type: none"> <li>1. Suicide (610)</li> <li>2. Poisoning (525)</li> <li>3. MV Traffic (431)</li> <li>4. Falls (271)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (7,570)</li> <li>2. MV Traffic (1,578)</li> <li>3. Self-harm (1,248)</li> <li>4. Poisoning (1,202)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (89,277)</li> <li>2. MV Traffic (23,224)</li> <li>3. Overexertion (23,124)</li> <li>4. Struck by/against (18,595)</li> </ol>
65-74	<ol style="list-style-type: none"> <li>1. Falls (395)</li> <li>2. MV Traffic (260)</li> <li>3. Firearms (243)</li> <li>4. Suffocation (143)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (394)</li> <li>2. Suicide (311)</li> <li>3. MV Traffic (260)</li> <li>4. Suffocation (106)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (10,106)</li> <li>2. MV Traffic (900)</li> <li>3. Poisoning (712)</li> <li>4. Self-harm (316)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (61,720)</li> <li>2. MV Traffic (10,280)</li> <li>3. Overexertion (9,581)</li> <li>4. Struck by/agnst (8,984)</li> </ol>
75-84	<ol style="list-style-type: none"> <li>1. Falls (995)</li> <li>2. MV Traffic (234)</li> <li>3. Not specified (221)</li> <li>4. Suffocation (194)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (995)</li> <li>2. MV Traffic (234)</li> <li>3. Not specified (212)</li> <li>4. Suicide (193)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (19,472)</li> <li>2. MV Traffic (824)</li> <li>3. Poisoning 548)</li> <li>4. Not specified (328)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (72,253)</li> <li>2. Struck by/against (6,452)</li> <li>3. MV Traffic (5,652)</li> <li>4. Overexertion (5,512)</li> </ol>
85+	<ol style="list-style-type: none"> <li>1. Falls (1,315)</li> <li>2. Not specified (407)</li> <li>3. Suffocation (227)</li> <li>4. MV Traffic (106)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (1,313)</li> <li>2. Not specified (398)</li> <li>3. Suffocation (220)</li> <li>4. MV Traffic (106)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (20,982)</li> <li>2. MV Traffic (355)</li> <li>3. Not specified (287)</li> <li>4. Poisoning (242)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (57,823)</li> <li>2. Struck by/against (3,637)</li> <li>3. Overexertion (2,058)</li> <li>4. Cut/pierce (1,774)</li> </ol>

### Burden of Injury in Ohio, 2000-2010

<b>Totals</b> *	<ol style="list-style-type: none"> <li>1. Poisoning (5,727)</li> <li>2. MV Traffic (3,433)</li> <li>3. Firearms (3,374)</li> <li>4. Falls (3,348)</li> </ol>	<ol style="list-style-type: none"> <li>1. Poisoning (4,716)</li> <li>2. Suicide (4,192)</li> <li>3. MV Traffic (3,433)</li> <li>4. Falls (3,277)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (71,273)</li> <li>2. Self-harm (16,645)</li> <li>3. MV Traffic (14,413)</li> <li>4. Poisoning (8,516)</li> </ol>	<ol style="list-style-type: none"> <li>1. Falls (920,454)</li> <li>2. Struck by/against (433,095)</li> <li>3. Overexertion (365,877)</li> <li>4. MV Traffic (300,593)</li> </ol>
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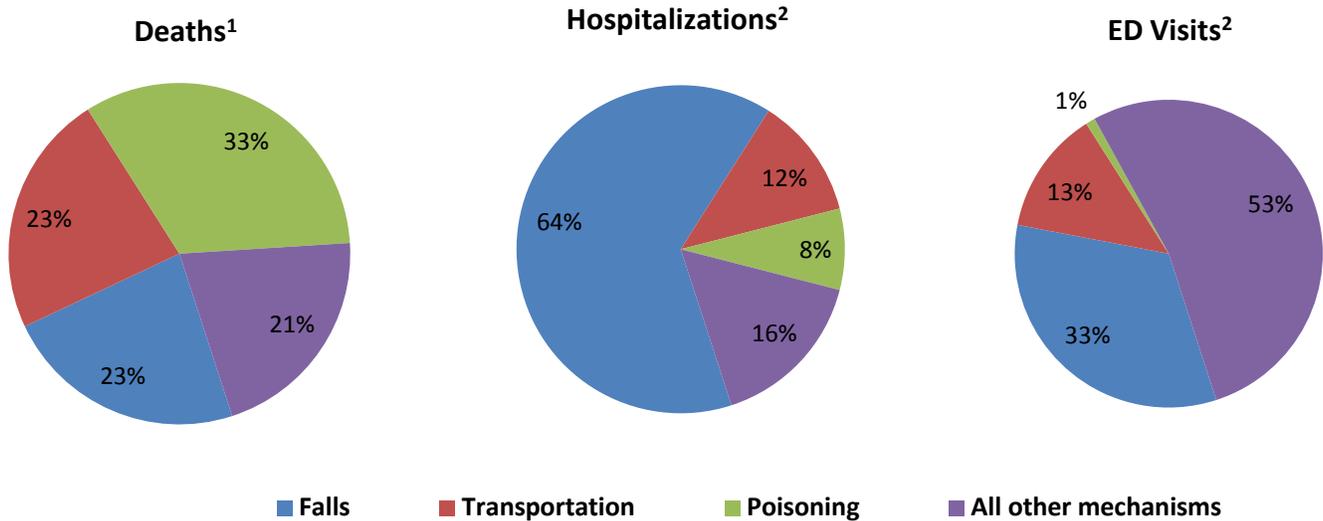
<sup>1</sup> **Source:** Ohio Dept. of Health, Office of Vital Statistics

<sup>2</sup> **Intent:** The state of mind of persons involved in an injury episode which forms the basis for categorizing an injury as unintentional (traditionally termed accidental), as homicide/assault, as suicide/self-inflicted or as unable to be determined

<sup>3</sup> **Source:** Ohio Hospital Association

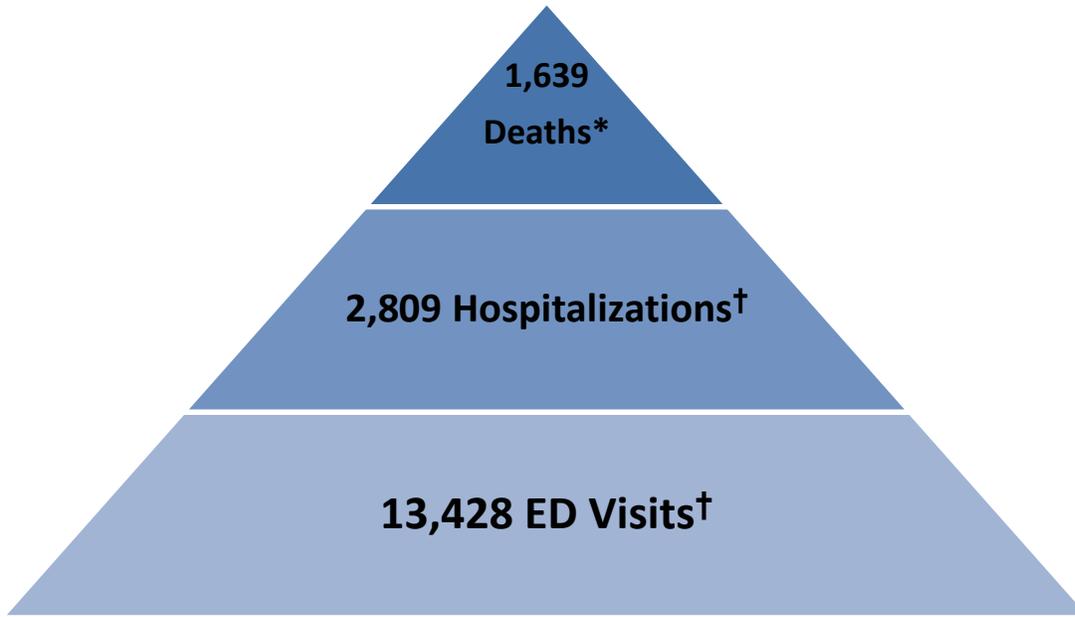
## SECTION 3: UNINTENTIONAL INJURIES

**Figure 3.1: Distribution of Injury-related death, hospitalization and ED visits by mechanism, Ohio, 2010**



In 2010, unintentional injuries accounted for two-thirds of all fatal injuries (including suicide, homicide and undetermined cases). Among discharges with an external cause of injury code, most injuries treated in hospitals were unintentional (80 percent of inpatient injuries and 94 percent of emergency department visits). The leading mechanism for unintentional injuries differed by severity (Figure 3.1). The leading cause of fatal unintentional injuries was poisoning (33%) followed by falls (23%) and transportation (23%). The leading mechanisms were the same for inpatient-related injuries however the distribution and rank of the mechanisms changed. Falls accounted for nearly two-thirds of injury related hospitalizations and was followed by transportation (12%) and poisoning (8%). These mechanisms represented a much smaller percentage of emergency department discharges (47 percent combined). Notably, being struck by or against (16%), overexertion (12%), and cutting or piercing (9 percent) were leading mechanisms of emergency department discharges that did not represent a sizeable proportion of fatal injuries or inpatient discharges.

## SECTION 3.1: UNINTENTIONAL POISONINGS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS

†SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

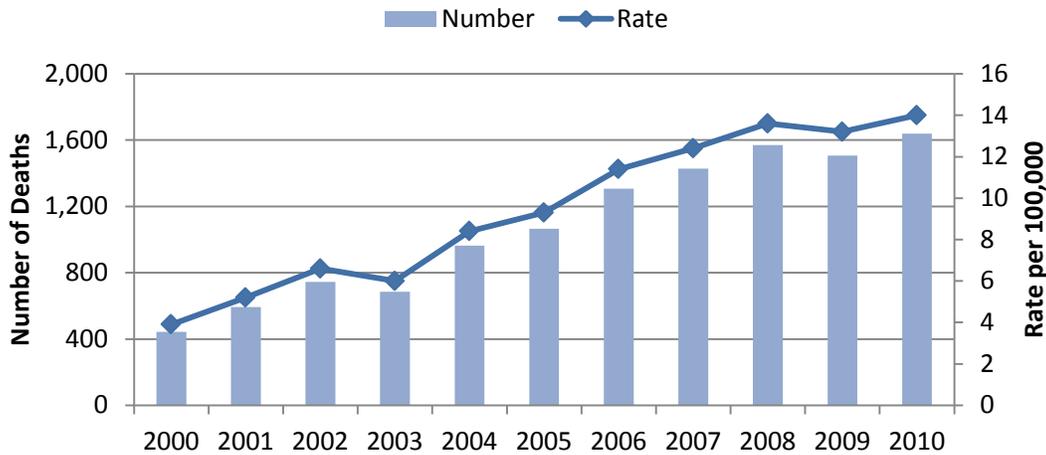
#### Patterns:

- Unintentional poisonings are one of the leading causes of fatal and non-fatal injuries.
- Higher rates of death and ED visits were found among males compared to females.
- Poisoning severity distinctly varied by age with the highest rates of death found among ages 45-54, hospitalizations among older adults ages 45 or older, and ED visits among children ages 1-4.
- Prescription medication and controlled substances are implicated in most unintentional poisoning deaths and hospitalizations. Approximately one-half of poisoning-related ED visits were associated with food and other non-drug substances; whereas drugs and medications have caused over 90 percent of unintentional poisoning deaths and hospitalizations.

#### Trends:

- Deaths, hospitalizations and ED visit rates have increased rapidly.
- Largest increases in death and hospitalization rates were found among ages 45-54. Largest increase in ED visit rates were found among children ages 1-4.

**Figure 3.2. Number and age adjusted rate of unintentional poisoning deaths by year, Ohio, 2000-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**DEATHS:**

In 2010, 1,639 Ohioans died from an unintentional poisoning. The 2010 unintentional poisonings fatality rate was 14.2 per 100,000 (see Figure 3.2). The rate of unintentional poisoning fatalities was higher among males (18.6 per 100,000) compared to females (10.0 per 100,000). Rates increased with age up to 45-54 year olds, and decreased among ages 55 and older (Figure 3.3). Whites had a higher rate than Blacks or Hispanics. See Table 3.1 for an unintentional poisoning death risk profile. Drugs and medicinal substances contributed to nearly all (94 percent) of the poisoning deaths in 2010 (Figure 3.4).

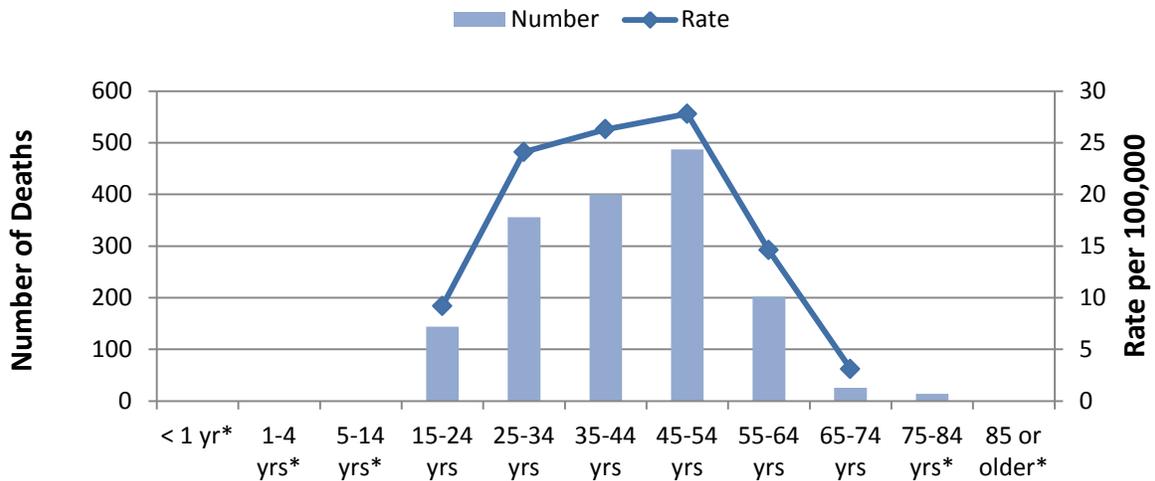
**Table 3.1. Unintentional Poisoning Death Risk Profile**

	2010 At Risk Groups	Annual trend since 2000
<b>Overall</b>		+264%
<b>Sex</b>	Males	Males (largest increase)
<b>Age</b>	45-54	45-54 and 25-34 (largest increases)
<b>Race and ethnicity</b>	Whites	Whites (largest increase)

**TRENDS:**

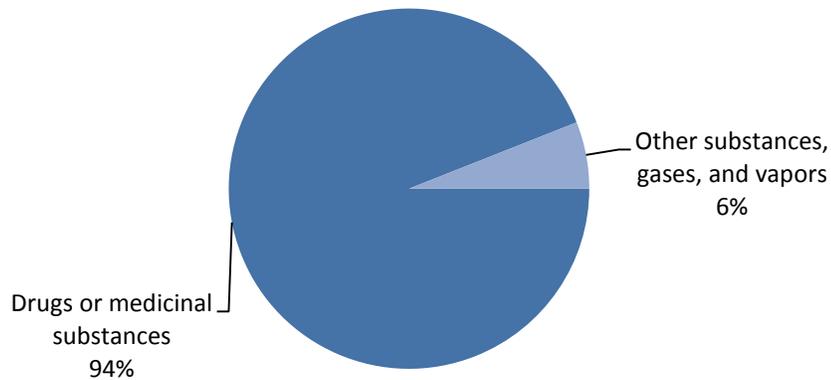
Fatal unintentional poisoning rates have quadrupled from 3.9 per 100,000 in 2000 to 14.2 per 100,000 in 2010 (Figure 3.2). Unintentional poisoning is now the leading cause of injury-related death in Ohio, surpassing motor vehicle traffic in 2006 and continuing the trend through 2010. Rates increased rapidly among both males and females. Fatality rates increased across most age groups with the largest increases observed among adults aged 45-54 and 25-34. Contrasting trends in drug poisoning deaths were found by race. In 2000, rates were higher among blacks than whites. Rates among whites increased by 1.2 deaths per 100,000 throughout the study period while rates among blacks increased in 2000-2006 then decreased in 2006-2010. Ultimately death rates among whites surpassed blacks in 2008 and remained higher in 2009-2010. Drugs and medications contributed to nearly all unintentional poisoning deaths throughout the study period. See Tables 4a-b located at the end of this section for more detailed information on the number and rate of unintentional poisoning fatalities.

**Figure 3.3. Number and rates for unintentional poisoning deaths by age group, Ohio, 2010**

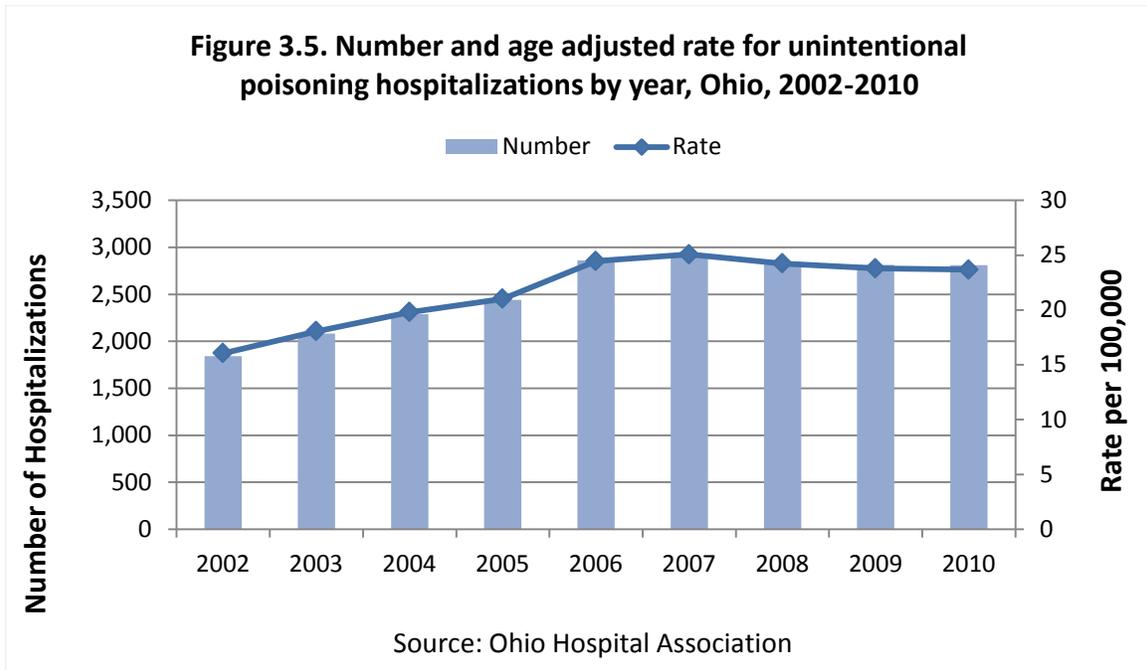


Source: Ohio Department of Health, Office of Vital Statistics  
 \*Rates suppressed due to < 20 deaths

**Figure 3.4. Distribution of unintentional poisoning deaths by agent, Ohio, 2010**



Source: Ohio Department of Health, Office of Vital Statistics



**HOSPITALIZATIONS:**

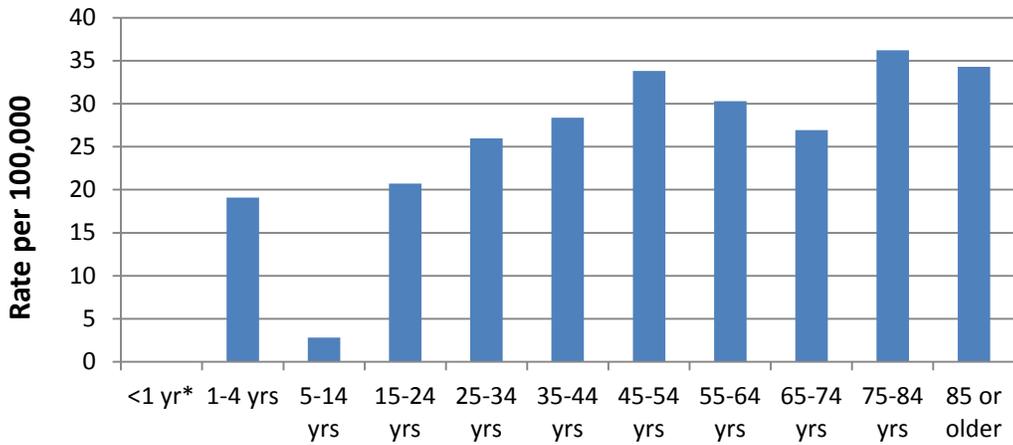
Over 2,800 hospitalizations resulted from unintentional poisonings in Ohio in 2010. The poisoning hospitalization rate was 24 per 100,000 (Figure 3.5). The hospitalization rate was similar for males and females and rates of hospitalizations varied by age. Starting at age 15, rates increased through age 54 then decreased among 55-74 year olds and increased among ages 75 or older (Figure 3.6). Rates of hospitalizations for males and females were similar among all age groups except for adults 85 or older with higher rates found among males (data not shown). Ninety-two percent of hospitalizations resulted from unintentional poisoning by a drug or medicinal substance (Figure 3.7).

Table 3.2 Unintentional Poisoning Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		+46%
Sex	Similar for males and females	Similar for males and females
Age	75-84	45-64 (largest increase)

**TRENDS:**

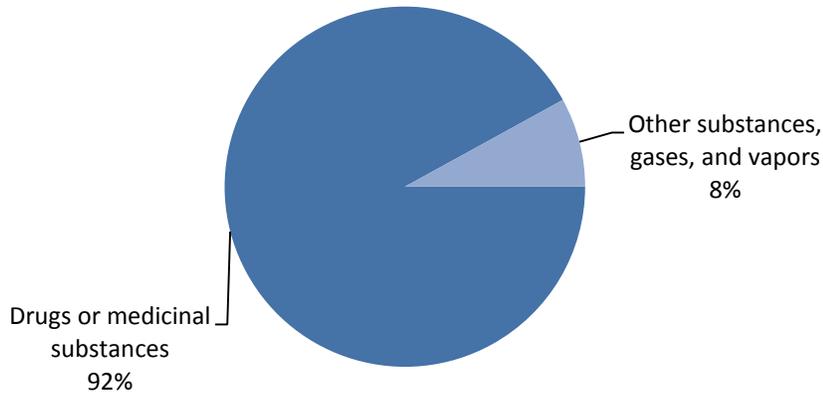
Unintentional poisoning hospitalizations rates increased 46 percent from 16 per 100,000 in 2002 to 24 per 100,000 in 2010. Rates increased by an average of 1 per 100,000 per year. The increase in hospitalizations was similar among males and females. Hospitalization rates increased among most age groups with the largest increases found among ages 45-64 (2 per 100,000). Most poisonings were caused by drugs or medications throughout the study period (data not shown). See Tables 5a-c located at the end of this section for more detailed information on the number and rate of unintentional poisoning hospitalizations.

**Figure 3.6. Rates for unintentional poisoning hospitalizations by age, Ohio, 2010**



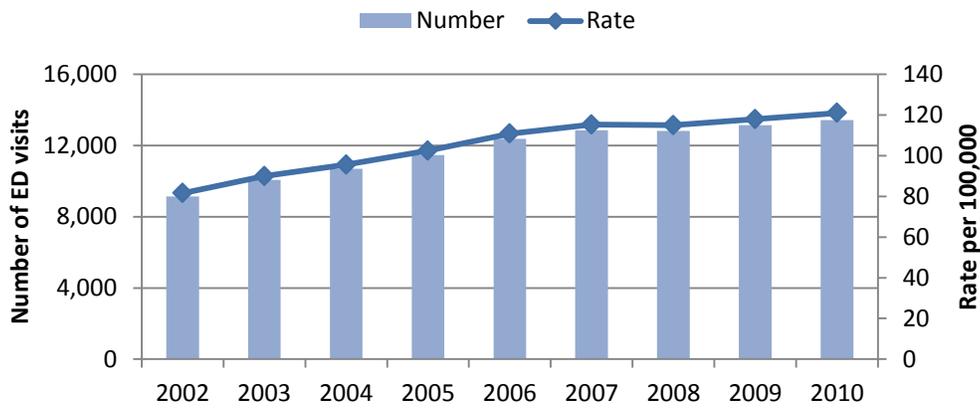
Source: Ohio Hospital Association  
\* Rate suppressed due to < 20 poisonings

**Figure 3.7. Distribution of unintentional poisoning hospitalizations by agent, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 3.8. Number and age adjusted rate for unintentional poisoning ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

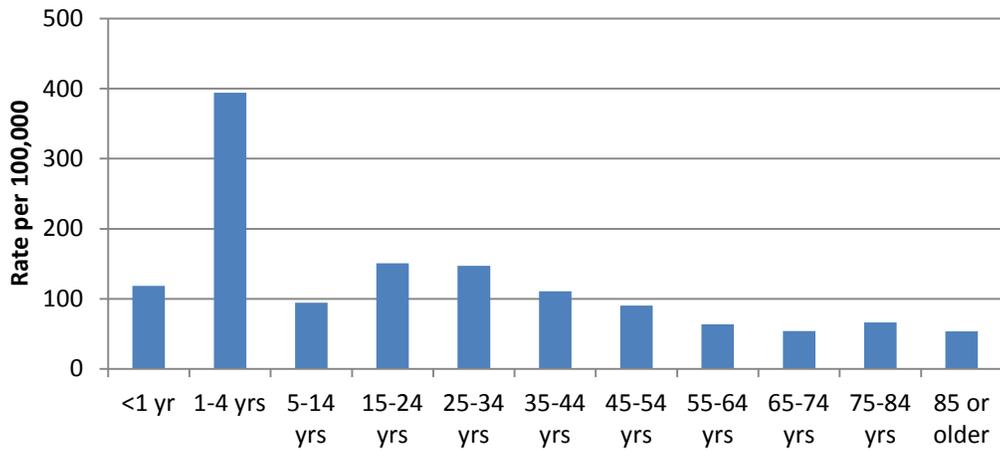
Over 13,000 ED visits resulted from unintentional poisonings in 2010. The ED visit rate was 121 per 100,000 (Figure 3.8). The rate of unintentional poisoning ED visits was slightly higher among males compared to females (129 versus 113 per 100,000). ED visit rates were the highest among children ages 1-4 years (Figure 3.9). See Table 3.3 for an unintentional poisoning ED visit risk profile. Approximately one-half of unintentional poisoning ED visits resulted from drug, medication or biological substances and the other half resulted from foodstuff and other non-drug substances (Figure 3.10).

Table 3.3 Unintentional Poisoning ED Visit Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		+48%
Sex	Males	Males (largest increase)
Age	1-4	1-4 (largest increase)

**TRENDS:**

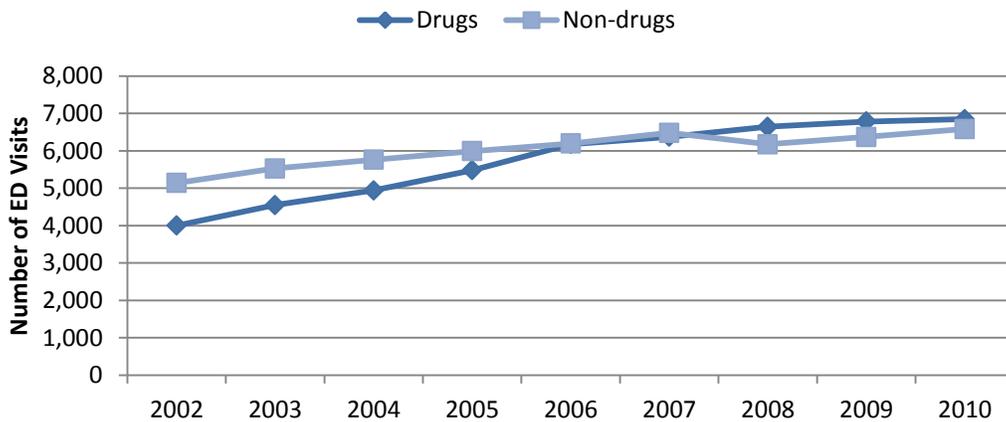
The rate of unintentional poisoning ED visits increased 48 percent from 82 per 100,000 in 2002 to 121 per 100,000 in 2010. The average annual increase was 5 ED visits per 100,000 per year. The annual increase was slightly higher among males (6 per 100,000) compared to females (4 per 100,000). ED visit rates increased across all age groups with the largest annual increases found among most age groups with the largest increase found among children ages 1-4 (14 per 100,000). The number of ED visits increased for both drug and non-drug substances. The number of ED visits resulting from drug, medicinal, and biologic substances increased by an average of 373 while foodstuff and other non-drug substances increased by an average of 160 per year. The number of ED visits resulting from drug related poisoning surpassed non-drug substances in 2008 and remained higher through 2010. See Tables 6a-c for more detailed information on the number and rate of unintentional poisoning ED visits.

**Figure 3.9. Rates for unintentional poisoning ED visits by age and sex, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 3.10. Number of unintentional poisoning ED visits by agent and year, Ohio, 2002-2010**



Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 4a. Number of deaths resulting from unintentional poisoning by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	443	593	745	686	963	1,065	1,308	1,428	1,570	1,507	1,639
<b>Sex</b>											
Males	313	390	487	462	648	687	865	928	1,010	963	1,056
Females	130	203	258	224	315	378	443	500	560	544	583
<b>Age</b>											
< 1 yr	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
1-4 yrs	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
5-14 yrs	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
15-24 yrs	17	56	60	90	108	109	112	129	121	109	144
25-34 yrs	76	96	130	133	156	207	244	263	320	341	356
35-44 yrs	175	213	260	191	289	294	372	383	388	385	400
45-54 yrs	121	165	202	191	290	326	428	470	494	470	487
55-64 yrs	25	25	51	35	68	83	111	138	177	146	202
65-74 yrs	8	13	17	12	21	20	14	27	30	28	26
75-84 yrs	12	14	18	12	20	16	11	10	25	18	14
85 or older	6	9	< 5	19	8	< 5	9	5	10	5	< 5
<b>Race/Ethnicity</b>											
White‡	359	463	610	576	795	912	1,110	1,238	1,371	1,332	1,458
Black‡	77	107	112	95	151	130	184	176	173	150	151
Hispanic	< 5	17	14	8	13	20	7	11	19	20	26
Other‡	< 5	6	< 5	< 5	< 5	< 5	< 5	< 5	5	5	< 5

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 4b. Death rates per 100,000 resulting from unintentional poisoning by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	3.9	5.2	6.6	6.0	8.4	9.3	11.4	12.4	13.6	13.2	14.2	1.1
<b>Sex†</b>												
Males	5.7	7.1	8.8	8.3	11.5	12.2	15.3	16.4	17.8	17.0	18.6	1.4
Females	2.2	3.4	4.4	3.8	5.4	6.4	7.5	8.4	9.5	9.4	10.0	0.8
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*	*	*
5-14 yrs	*	*	*	*	*	*	*	*	*	*	*	*
15-24 yrs	*	3.6	3.8	5.7	6.8	6.9	7.1	8.2	7.7	7.0	9.2	*
25-34 yrs	5.0	6.4	8.8	9.0	10.6	14.1	16.7	17.9	21.7	23.1	24.1	2.0
35-44 yrs	9.7	12.0	14.9	11.2	17.2	17.8	22.9	24.0	24.9	25.3	26.3	1.8
45-54 yrs	7.7	10.1	12.3	11.4	17.1	18.9	24.6	26.8	28.1	26.8	27.8	2.3
55-64 yrs	2.5	2.4	4.7	3.1	5.8	6.8	8.8	10.6	13.2	10.5	14.6	1.2
65-74 yrs	*	*	*	*	2.7	2.6	*	3.4	3.7	3.4	3.1	*
75-84 yrs	*	*	*	*	3.6	*	*	*	4.6	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*	*	*
<b>Race/Ethnicity†</b>												
White‡	3.7	4.8	6.3	6.0	8.3	9.5	11.6	12.9	14.3	14.1	15.4	1.2
Black‡	6.4	8.6	9.0	7.6	12.0	9.9	14.0	13.2	13.0	11.1	11.0	0.5
Hispanic	*	*	*	*	*	8.0	*	*	*	7.1	9.5	-
Other‡	*	*	*	*	*	*	*	*	*	*	*	-

\*Rates suppressed due to less than 20 deaths.

‡Non-Hispanic

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 5a. Number of hospitalizations resulting from unintentional poisonings, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	1,858	2,096	2,303	2,461	2,879	2,957	2,867	2,840	2,809
<b>Sex</b>									
Males	945	1,025	1,108	1,234	1,509	1,428	1,392	1,396	1,384
Females	913	1,071	1,195	1,227	1,370	1,529	1,475	1,444	1,425
<b>Age</b>									
< 1 yr	12	14	9	13	17	20	18	18	7
1-4 yrs	181	191	175	160	188	218	228	200	111
5-14 yrs	76	63	72	54	55	65	88	54	43
15-24 yrs	240	295	307	304	354	328	303	330	329
25-34 yrs	190	237	249	309	333	372	329	379	366
35-44 yrs	334	352	397	407	474	447	433	398	420
45-54 yrs	305	359	425	474	595	595	590	579	589
55-64 yrs	166	200	223	267	374	351	382	380	440
65-74 yrs	165	153	205	239	227	255	237	246	229
75-84 yrs	132	166	171	149	175	212	176	176	196
85 or older	57	66	70	85	87	94	83	80	79

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 5b. Hospitalization rates per 100,000 resulting from unintentional poisonings, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	16.2	18.2	19.9	21.2	24.6	25.3	24.4	24.0	23.7	1.0
<b>Sex†</b>										
Males	17.2	18.6	20.1	22.2	26.9	25.4	24.5	24.6	24.3	1.0
Females	15.2	17.7	19.7	20.1	22.3	24.9	24.2	23.5	23.0	1.0
<b>Age</b>										
< 1 yr	*	*	*	*	*	13.2	*	*	*	*
1-4 yrs	30.1	31.9	29.4	26.9	32.0	37.1	38.6	33.8	19.1	-0.2 (NL)
5-14 yrs	4.7	3.9	4.6	3.5	3.6	4.3	5.9	3.6	2.8	-0.1 (NL)
15-24 yrs	15.2	18.5	19.2	19.1	22.4	20.8	19.3	21.1	20.7	0.5 (NL)
25-34 yrs	12.9	16.2	17.0	21.2	22.9	25.5	22.5	25.6	26.0	1.6
35-44 yrs	19.1	20.6	23.7	24.7	29.2	28.1	27.8	26.2	28.4	1.1
45-54 yrs	18.5	21.5	25.1	27.6	34.3	34.0	33.7	33.0	33.8	2.0
55-64 yrs	15.3	17.8	19.1	22.0	29.8	27.0	28.7	27.4	30.3	1.9
65-74 yrs	21.4	19.9	26.7	31.2	29.5	32.6	29.4	29.4	26.9	1.0 (NL)
75-84 yrs	23.9	29.9	30.8	26.9	31.8	39.1	32.9	32.5	36.2	1.2
85 or older	30.2	33.7	34.9	41.1	40.5	42.2	36.3	35.2	34.3	0.4 (NL)

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 5c. Number of hospitalizations resulting from unintentional poisonings by agent and year, Ohio, 2002-2010**

YEAR	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
<b>Drug, medicinal, or biologic substances</b>	1,625	1,881	2,060	2,212	2,639	2,693	2,615	2,632	2,579	127
<b>Non-drug substances</b>	233	215	243	249	240	264	252	208	230	0

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 6a. Number of ED visits resulting from unintentional poisonings by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	9,141	10,075	10,703	11,469	12,370	12,856	12,815	13,152	13,428
<b>Sex</b>									
Males	4,650	5,064	5,342	5,843	6,358	6,513	6,574	6,765	7,049
Females	4,491	5,011	5,361	5,626	6,012	6,343	6,241	6,387	6,379
<b>Age</b>									
< 1 yr	196	189	162	168	205	239	218	230	165
1-4 yrs	1,950	2,050	2,080	2,173	2,422	2,591	2,635	2,618	2,294
5-14 yrs	1,025	1,164	1,249	1,309	1,438	1,523	1,471	1,504	1,439
15-24 yrs	1,570	1,720	1,803	1,970	2,107	2,106	2,125	2,194	2,389
25-34 yrs	1,298	1,464	1,495	1,697	1,724	1,789	1,807	1,970	2,071
35-44 yrs	1,267	1,361	1,479	1,497	1,507	1,505	1,505	1,506	1,637
45-54 yrs	866	958	1,106	1,234	1,333	1,370	1,359	1,402	1,572
55-64 yrs	386	533	593	676	723	769	828	833	920
65-74 yrs	304	319	386	350	427	465	419	443	459
75-84 yrs	224	242	269	299	361	366	316	327	359
85 or older	55	75	81	96	123	133	132	125	123

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 6b. ED visit rates per 100,000 resulting from unintentional poisonings by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	82	90	96	102	111	115	115	118	121	4.9
<b>Sex†</b>										
Males	84	91	96	105	115	118	119	122	129	5.5
Females	79	88	95	99	106	112	111	113	113	4.3
<b>Age</b>										
< 1 yr	133	128	109	115	138	158	143	156	119	2.3 (NL)
1-4 yrs	324	343	349	366	413	441	446	442	394	14.1
5-14 yrs	63	73	79	84	94	101	98	101	95	4.4
15-24 yrs	99	108	113	124	133	134	135	140	151	5.5
25-34 yrs	88	100	102	116	118	122	123	133	147	6.4
35-44 yrs	73	80	88	91	93	94	97	99	111	3.9
45-54 yrs	53	57	65	72	77	78	78	80	90	4.2
55-64 yrs	36	47	51	56	58	59	62	60	63	2.9
65-74 yrs	39	41	50	46	56	59	52	53	54	1.8
75-84 yrs	40	44	48	54	66	67	59	60	66	3.1
85 or older	29	38	40	46	57	60	58	55	53	3.3

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

**Table 6c. Number of ED visit rates resulting from unintentional poisonings by agent and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Substances involved</b>											
Drugs, biologic, or medicinal substances	4,001	4,550	4,941	5,480	6,177	6,374	6,643	6,781	6,846	51%	373
Non-drug substances	5,140	5,526	5,762	5,989	6,195	6,482	6,172	6,371	6,582	49%	160

Source: Ohio Hospital Association

## **SECTION 3.1A: UNINTENTIONAL DRUG POISONINGS (OVERDOSES)**

### **BACKGROUND INFORMATION**

- Drugs/medications are involved with 95% of unintentional poisoning deaths.
- Drugs/medications are involved with 92% of unintentional poisoning hospitalizations.
- Drug overdose death rates increased 319 percent in the past decade in Ohio.
- Drug poisonings are now the leading cause of injury death in Ohio.

*Please note that the terms drug poisoning and overdose will be used interchangeably in this report.*

From 2000 to 2010, unintentional drug overdose (poisoning) deaths have increased more than 319% and are now the leading cause of injury death in Ohio surpassing motor vehicle traffic, suicide, homicide, firearms and falls. On average, an Ohioan suffers an unintended drug overdose every six hours leading to four deaths per day in this state alone. This epidemic is largely driven by abuse and misuse of prescription pain medication (opioids). In 2010, 45 percent of Ohio unintentional overdose deaths involved prescription opioids. These medications led to more deaths than any other legal or illicit substance including heroin and cocaine combined. Factors contributing to this epidemic include:

- Changes in clinical pain management guidelines encouraging the use of opioids as a result of pain treatment advocacy groups and pharmaceutical companies leading to state law changes.
- Release of new, long-acting opioids into the market (e.g., OxyContin, Duragesic)
- Aggressive marketing of opioids by pharmaceutical companies to primary care physicians
- Use of methadone as a pain medication
- Widespread prescribing, abuse and diversion of these medications

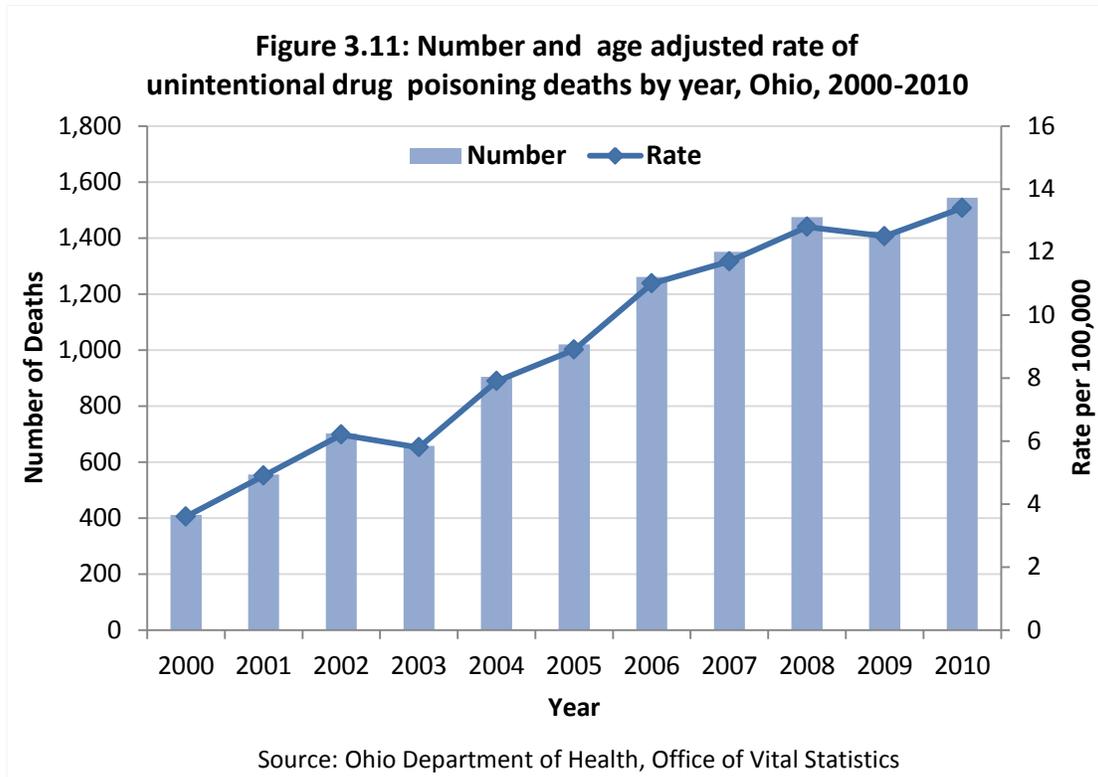
These factors led to rapid increases in the prescribing of prescription opioids for chronic pain. From 1997 to 2010, the total distribution of opioid grams (in morphine milligram equivalent grams) per 100,000 Ohioans increased 670 percent (Source: DEA ARCOS reports). The increasing use of prescription opioids has led to increased risk for opioid dependency and addiction and subsequent diversion of medications as those affected find ways to obtain the drugs.

Admissions for prescription opioid substance abuse treatment have closely followed increased prescribing trends and overdose death rates. In the past decade, admissions have increased more than 750 percent in Ohio (Source: Treatment Episode Data System, SAMHSA). Ohio's fatal overdose epidemic is the result of the increased exposure to these highly addictive and powerful medications with essentially the same active ingredient as heroin.

This epidemic is not limited to Ohio. In 2008, there were 14,800 prescription painkiller deaths across the United States. For every 1 death, there are 10 treatment admissions for abuse, 130 people who abuse or are dependent and 825 nonmedical users leading to significant direct and indirect costs.

## PROGRAMMATIC EFFORTS TO ADDRESS DRUG POISONING

- **Surveillance of drug overdose trends and patterns** and providing data on the Ohio Drug Overdose webpage: <http://www.healthyohioprogram.org/vipp/drug/dpoison.aspx>
- **Coordination of the Prescription Drug Abuse Action Group (PDAAG)** The PDAAG is an ongoing state-level work group comprised of over 100 member organizations dedicated to reducing prescription drug abuse, misuse and overdose in Ohio. The PDAAG serves as a conduit for information sharing, networking and the development of state-level recommendations to address the issue. The PDAAG is an action group of the Ohio Injury Prevention Partnership (OIPP) described in the report introduction.
- **Conducting a social marketing campaign: Prescription for Prevention: Stop the Epidemic (P4P) ([www.p4pohio.org](http://www.p4pohio.org))**. P4P is a multi-level social marketing campaign to combat the epidemic of prescription drug overdose that includes coalition establishment and support in high risk counties, public education and outreach, TV and radio public service announcements, peer-to-peer programs in schools and education at work sites.
- **Funding two pilot projects in Scioto and Montgomery Counties from 2010-2013** with funding from the CDC's Preventive Health and Health Services Block Grant. These projects engage in activities such as coalition development, education of healthcare prescribers and service providers, formation of a poison death review committee, policy development and implementation of public education and awareness campaigns.
- **Providing start-up support and resources for Scioto County's naloxone distribution program: Project DAWN** (Deaths Avoided with Naloxone) <http://bit.ly/projectdawn>; the first of its kind in the State.
- **Encouraging excess drug disposal solutions and methods** such as take back events and permanent drug disposal drop boxes through the development of take-back guidelines and support for permanent drop boxes.
- **Collaboration with other state organizations to plan conferences, summits and educational opportunities.**
- Providing support for the Governor's Opiate Cabinet Action Team, Prescriber Education Workgroup including **development of Emergency and Acute Care Opioid and Other Controlled Substances Prescribing Guidelines and other responsible prescribing guidelines.**



**DEATHS:**

In 2010, 1,544 Ohioans died from unintentional drug poisoning with a fatality rate of 13.4 per 100,000 (Figure 3.11). The rate of unintentional drug poisoning fatalities was higher among males (17.5 per 100,000) compared to females (9.5 per 100,000). Rates of unintentional poisoning fatalities began increasing at age 15 and peaked among adults age 54 then decreased among adults 55 or older. Whites had a rate of 14.6 per 100,000 followed by blacks (10.3 per 100,000) and Hispanics (8.0 per 100,000). See Table 3.4 for an unintentional drug poisoning death risk profile.

	2010 At Risk Groups	Annual trend since 2000
Overall		+319%
Sex	Males	Similar for males and females
Age	45-54	45-54 (largest increase)
Race and ethnicity	Whites	Whites (largest increase)

**TRENDS:**

Since 2000, fatal unintentional drug poisoning rates have increased 319 percent from 3.6 per 100,000 in 2000 to 13.4 per 100,000 in 2010. A rapid increase in rates was found among males and females. Fatality rates increased among ages 25-64 with the largest increase found among ages 25-34 and 45-54 (2.0 per 100,000 per year). Although whites exhibit the largest rate increase over time, 329 percent, Black, Non-Hispanics have had higher rates in seven of the last eleven years. It is not until 2008, that whites exceed rates among blacks.

The top six drug categories that were coded on the death certificate as contributing to the unintentional drug poisoning death are presented on the right. The categories are presented as the five-year average number of deaths for comparison purposes for 2000 to 2010 in Table 3.5.

Drug Category	2000-2005 Annual Ave.	2006-2010 Annual Ave.	Percent of all 2006-10 Overdoses
Other/Unspecified Drug Included <sup>3</sup>	504	842	60%
All Opioids	337	613	43%
Prescription Opioids	254	460	33%
Other/Unspecified Drug Only <sup>4</sup>	186	341	24%
Cocaine	159	215	15%
Heroin	100	224	16%
All Overdoses*	<b>708</b>	<b>1,411</b>	

1. The category with the highest number of average occurrences is “other or unspecified drug included”\*, which groups all instances where an unspecified drug (e.g., multiple drug use, poly-substance use) was listed on the death certificate as contributing to an individual’s death. This drug category indicates multiple drugs were involved in the death. This category increased by 67 percent from the 2000 - 2005 average of 504 occurrences to the 2006- 2010 average of 842. From 2006 to 2010, approximately 60 percent of the unintentional overdoses included *other/unspecified* drugs.

2. The second drug category, all opioids, includes prescription opioids as well as heroin. Fatal unintentional overdoses involving all opioids increased by 82 percent from the 2000 - 2005 average of 337 occurrences to the 2006- 2010 average of 613. From 2006 to 2010, 43 percent of the unintentional overdoses included *all opioids*.

3. The third drug category, prescription opioids includes commonly-prescribed narcotic pain medications such as hydrocodone, oxycodone, fentanyl, morphine, codeine, methadone, etc. This category increased by 81 percent from the 2000 - 2005 average of 254 occurrences to the 2006- 2010 average of 460. From 2006 to 2010, one-third of the unintentional overdoses involved a prescription opioid. This percentage has been increasing and is 45 percent for 2010.

4. The fourth drug category includes only instances where only “other/unspecified drug(s)” were listed as the cause of death for the individual. The first drug category “Other/Unspecified Included” differs from this category in that specific drugs may have been included in addition to other/unspecified. The unspecified only drug category increased 83 percent from the 2000 - 2005 average of 186 occurrences to the 2006- 2010 average of 341. In nearly one in four (24 percent) of the overdoses, no specific drug is indicated on the death certificate.

5. Fatal unintentional overdoses involving cocaine increased by 35 percent from the 2000 - 2005 average of 159 occurrences to the 2006- 2010 average of 215. Cocaine was mentioned in 15 percent of the unintentional overdoses from 2006 to 2010.

<sup>1</sup>Source: ODH Office of Vital Statistics  
<sup>2</sup>Multiple drugs may be involved in any death.  
<sup>3</sup>includes all instances where 'other/unspecified' is included as contributing to death; may also be included with specific drugs.  
<sup>4</sup>includes only those instances where no other drug than 'other/unspecified' is included as contributing to death.

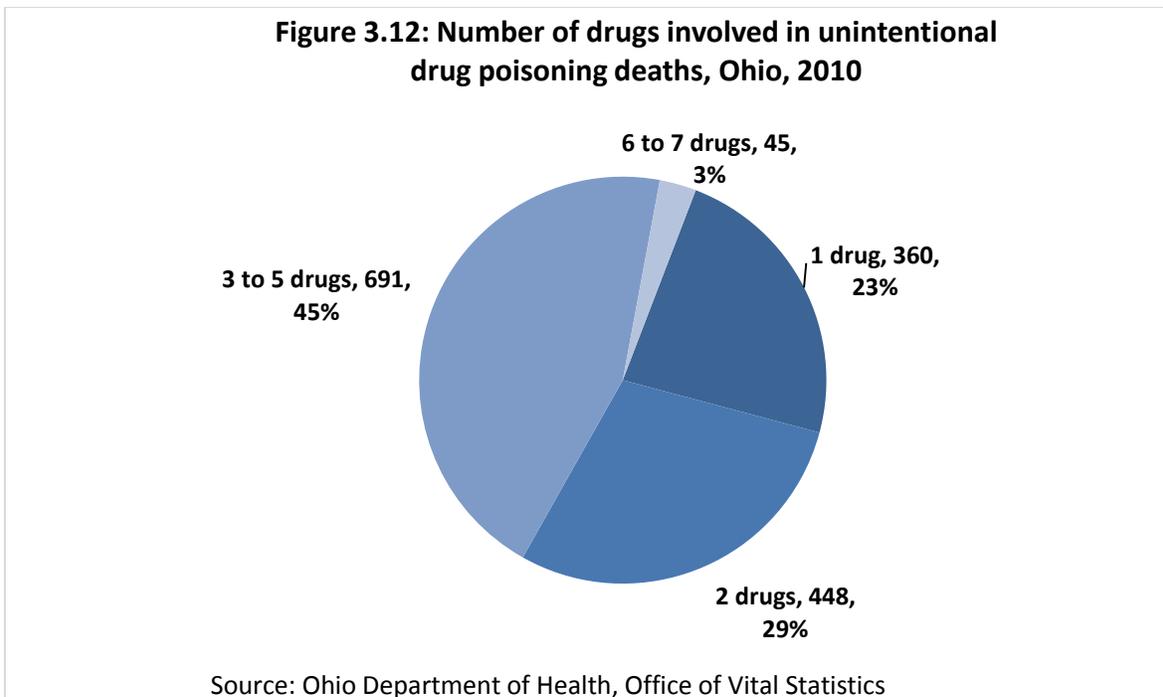
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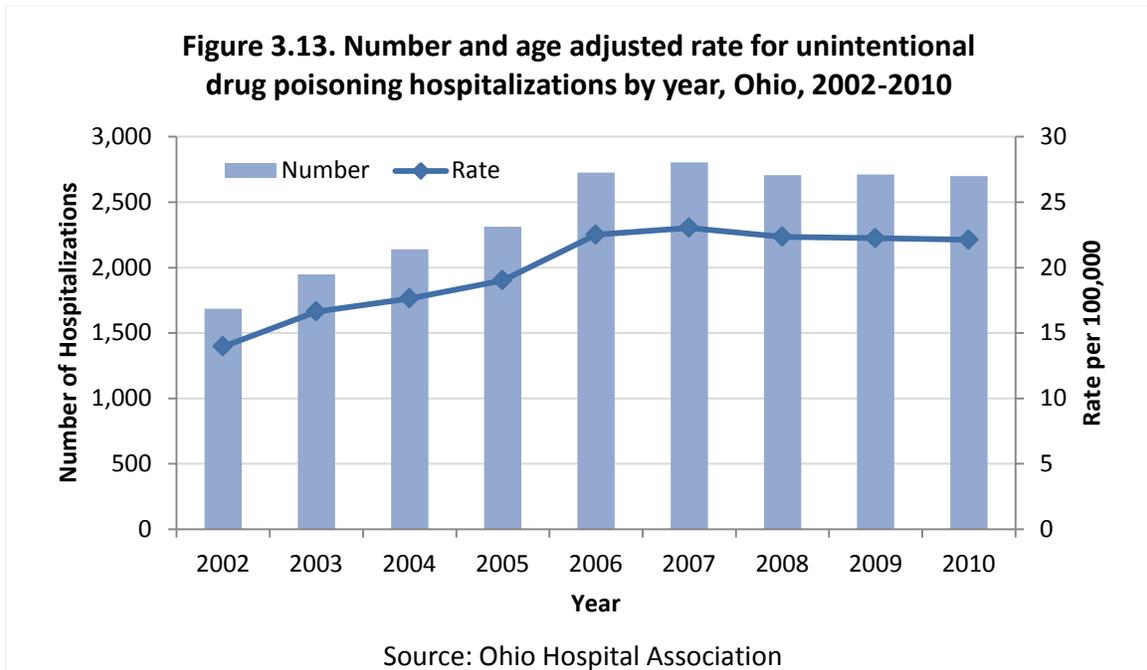
- 6. Fatal unintentional overdoses involving heroin increased from an average of 100 annual occurrences in 2000-2005 to an average of 224 annual occurrences in 2006-2010. In 2006-2010, 15 percent of the unintentional overdoses involved heroin.

Notice that the rank order of the drug category occurrences did not change from the 2000-2005 average to the 2006- 2010 average. As stated above, all of the drug category occurrences increased, however, cocaine only increased by 35 percent while other/unspecified drug only, other/unspecified drug included, prescription opioids and all opioids were all above 80 percent. Also stated above is that the drug categories, except for other/unspecified drug only, are not mutually exclusive, so that multiple drugs can be listed on the death certificate as contributing to the death.

### MULTIPLE DRUG USE

After examining the types of drugs involved in unintentional drug poisonings, the emphasis now turns to the number of substances involved in the death. In addition to rapidly rising opioid use, multiple drug use is another key contributing factor in this epidemic. Presenting the number of drugs/medications listed on the death certificate, Figure 3.12 displays the percentage of single and multiple unintentional drug poisoning deaths for Ohio in 2010. Grouped into categories, 360 or nearly one fourth (23 percent) of the decedents had only one drug listed **while the remaining three fourths (77%) involved more than one substance**. Twenty nine percent (448) of decedents had 2 drugs/medications. The largest category with 45 percent (691) had 3 to 5 drugs/medications while the smallest group, with 3 or 3 percent of the individuals, had 6 to 7 drugs/medications. None of the death certificates indicated over 7 drugs were involved in the deaths.





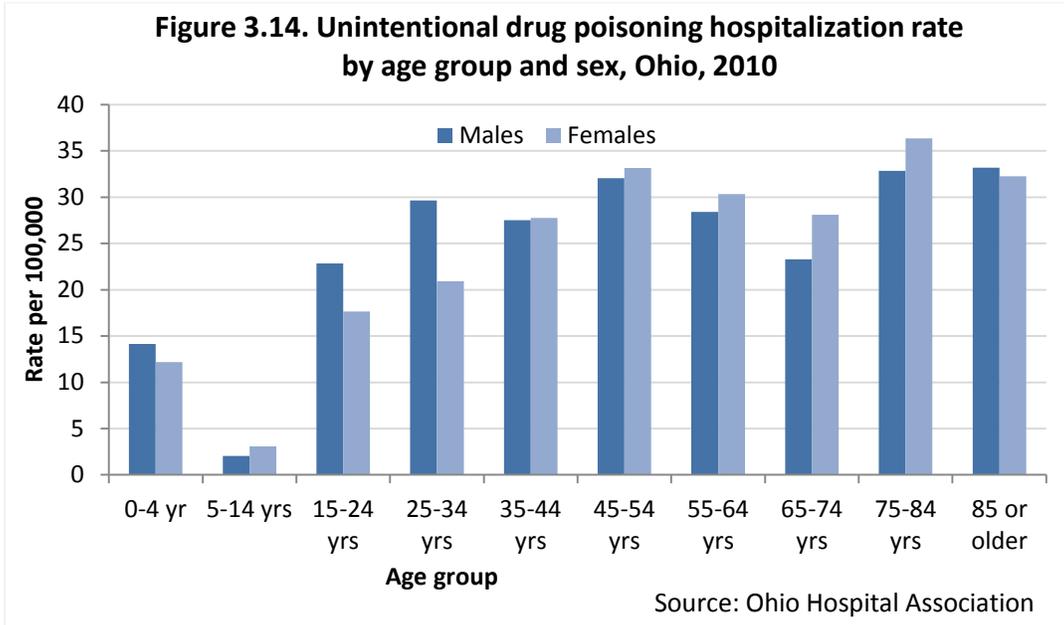
**HOSPITALIZATIONS:**

Over 2,700 hospitalizations resulted from unintentional drug poisonings in Ohio in 2010 (Figure 3.13). Nearly all (92 percent) of the hospitalizations for unintentional poisoning were related to drug/medications. For both males and females, the number of drug poisoning-related hospitalizations decreased with age from 0-14 years, steadily increased between ages 15 and 54, and remained elevated among ages 55 or older (Figure 3.14). See Table 3.6 for an unintentional drug poisoning hospitalization risk profile.

Table 3.6 Unintentional Drug Poisoning Hospitalization Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		+57%
Sex	Similar for males and females	Similar for males and females
Age	45 or older	45-54 (largest increase)

**TRENDS:**

Unintentional drug poisoning hospitalization rates for unintentional drug poisonings have increased from 14 per 100,000 in 2002 to 22 per 100,000 in 2010. Rates increased on average by 1 hospitalization per 100,000 per year. The increase was similar for males and females. The hospitalization rate increased across almost all age groups, with the largest increase found among adults ages 45-54 (2 per 100,000 per year). Trends among ages 0-14 and 85 or older did not follow a linear trend. See Tables 8a and 8b located at the end of this section for more detailed information on the number and rate of hospitalizations resulting from unintentional drug poisoning.



**DRUGS AND MEDICATION:**

Between 2007 and 2010, the most common drugs involved in unintentional poisoning were opioids (889 per year), prescription opioids (841 per year), alcohol (523 per year), benzodiazepines (498 per year), cocaine (307 per year), tranquilizers (287 per year), methadone (189 per year) and heroin (133 per year). An increase in the annual number of poisonings was found for almost all drug categories. The largest increases were found for methadone (73 percent), all opioids (51 percent), and prescription opioids (51 percent). In contrast, the annual number of poisonings involving cocaine remained the same in 2002-2006 and 2007-2010.

Consistent with death data, all opioids and prescription opioids were involved in the greatest percentage (33 percent or one-third) of hospitalizations for unintentional drug overdose. Among specific opioids, methadone was involved in a higher percentage of the unintentional overdoses than heroin. Prescription opioids and

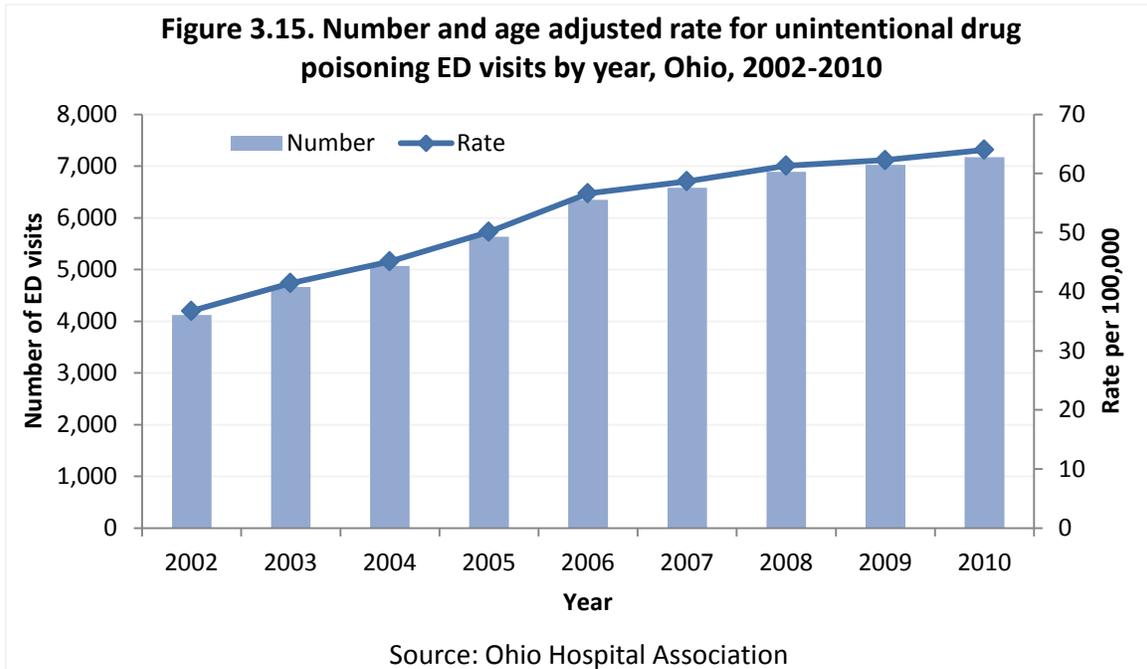
**Table 3.7 Drug Involvement in Unintentional Drug Poisoning Hospitalizations: Risk Profile**

Drug Category	2002-2006 Annual Ave.	2007-2010 Annual Ave.	Percent of all 2007-2010 Drug Poisonings
All opioids	587	889	33%
Prescription opioid	557	841	31%
Alcohol	408	523	19%
Benzodiazepines	341	498	18%
Cocaine	307	307	11%
Tranquilizers	201	287	11%
Methadone	87	189	7%
Heroin	86	133	5%
All Drug Poisoning Hospitalizations	2,162	2,731	

Ohio Violence and Injury Prevention Program, Ohio Department of Health

benzodiazepines were involved in 31 and 18 percent, respectively, of the hospitalized unintentional overdoses.

See table 8c at the end of this section for more detailed information on the number of drugs and medications involved with unintentional poisonings.



**EMERGENCY DEPARTMENT VISITS:**

Approximately 7,200 ED visits resulted from unintentional drug poisonings in 2010 resulting in a rate of 64 visits per 100,000 Ohioans (Figure 3.15). The rate of unintentional drug poisoning-related ED visits was similar among males and females for ages 0-74. Among ages 75 or older, rates were higher for males compared to females. The highest rate of ED visits was found among children ages 1-4 years (264 per 100,000) while the lowest number of ED visits was found among children ages 5-14 (24 per 100,000) (Figure 3.16). See Table 3.8 for an unintentional drug poisoning ED visit risk profile.

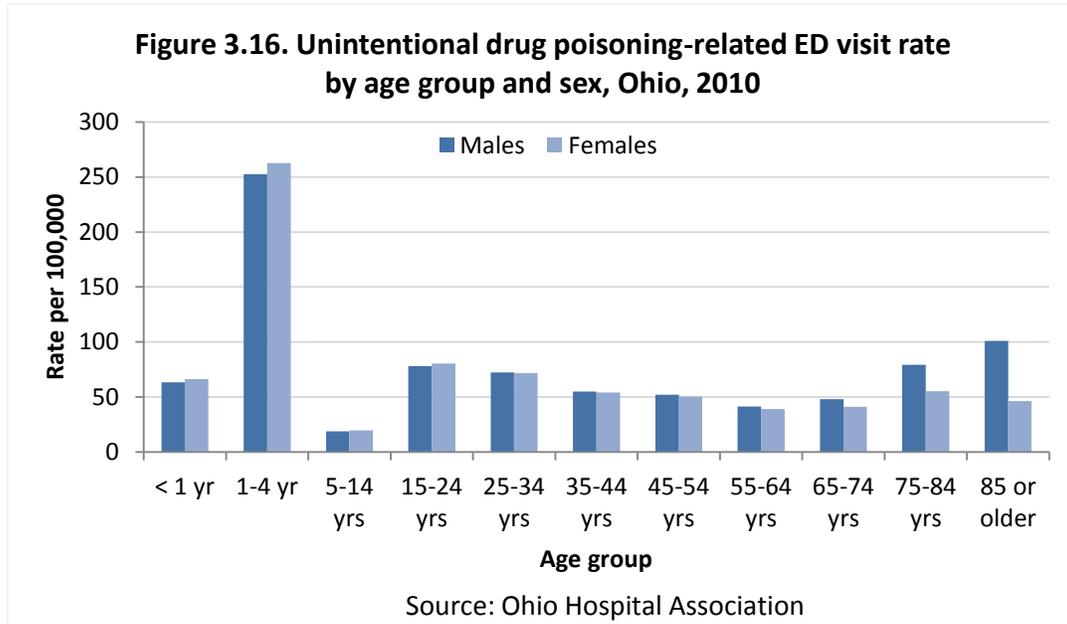
Table 3.8 Unintentional Drug Poisoning ED Visit Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		+73%
Sex	Similar for males and females	Similar for males and females
Age	1-4 years	1-4 years (largest increase)

**TRENDS:**

Since 2002, the rate of unintentional drug poisoning-related ED visits nearly doubled from 37 per 100,000 in 2002 to 64 per 100,000 in 2010. The average annual increase was 4 per 100,000 per year. The increase was similar among males and females. Drug poisoning-related ED visit rates increased among all age groups with the largest increases found among children ages 1-4 (14 per 100,000 per year). See Tables 9a and 9b located

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at the end of this section for more detailed information on the number and rate of unintentional drug poisoning ED visits.



**DRUGS AND MEDICATION:**

From 2007 to 2010, the most common drugs involved with ED visits resulting from unintentional drug poisonings included opioids (1,185 per year), prescription opioids (909 per year), benzodiazepines (635 per year), tranquilizers (557 per year), methadone (475 per year) and heroin (442 per year). The number of ED visits increased rapidly among most drug categories. Compared to annual averages in 2002-2006, the most rapid increase was found among visits associated with the use of Methadone (265 percent) and Heroin (149 percent).

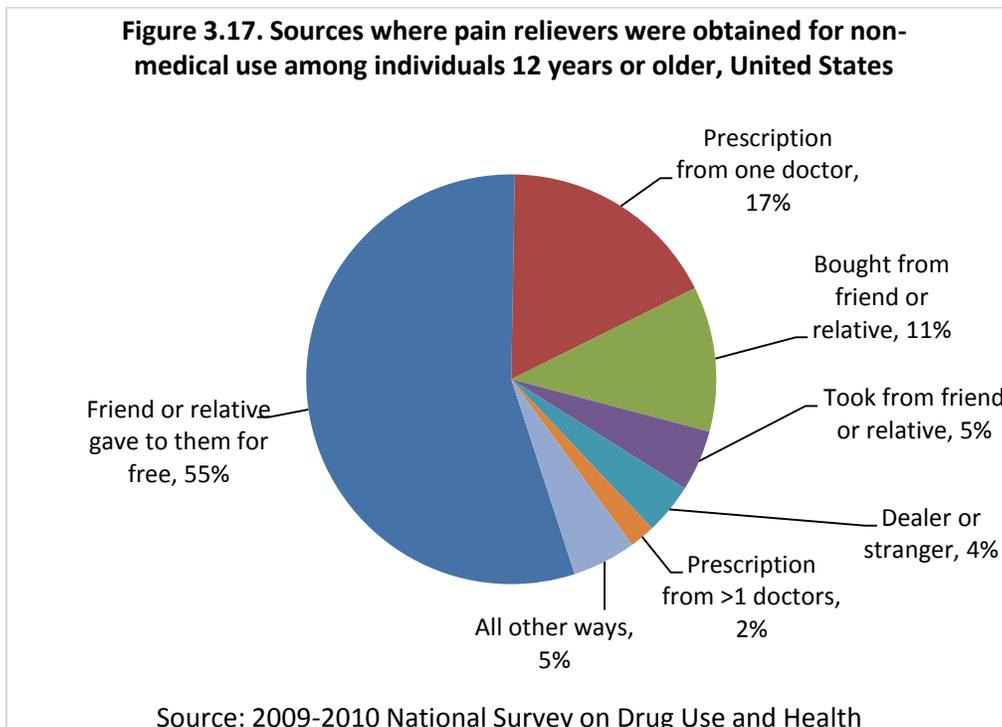
See Table 9c located at the end of this section for more detailed information on trends in the type of drugs associated with unintentional drug poisoning ED visits.

Drug Category	2002-2006 Annual Ave.	2007-2010 Annual Ave.	Percent of all ED Visits for Drug Poisoning, 2007-2010
All opioids	662	1,185	17%
Prescription opioids	509	909	13%
Benzodiazepines	442	635	9%
Tranquilizers	330	557	8%
Methadone	130	475	7%
Heroin	178	442	6%
Alcohol	325	377	5%
<b>Total ED Visits for Drug Poisoning</b>	<b>5,170</b>	<b>6,919</b>	

**PAIN MEDICATION USE:**

According to the 2010, Ohio Behavioral Risk Factor Surveillance Survey (BRFSS), one third of adults in Ohio reported using pain medications in the last 12 months. The use of pain medication varied across segments of the population. Females were more likely to report use than males. Adults who were widowed, separated, or divorced were more likely to use than married couples. Substantial differences in pain medication use were found by socioeconomic groups. College graduates were less likely to use pain medications than other educational attainment categories. Adults living below or near the federal poverty level were more likely to report usage than individuals 200 percent or more above poverty.

While opioid pain medications are controlled substances that should be accessible only through prescriptions by legitimate prescribers, studies have shown these medications are commonly diverted and used by people for whom they are not prescribed. Nationwide, most nonmedical users of pain relievers reported accessing the drugs through someone else. The most common source was a friend or relative (71 percent) with most getting the pain relievers for free (55 percent), some buying them (11 percent) and a small proportion taking them without asking (5 percent). Only 1 in 5 reported obtaining pain relievers through one (17 percent) or more doctors (2 percent) (see Figure 3.17).



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In Ohio, the most common prescription pain medications reported were drugs with the active ingredients of hydrocodone (e.g., Vicodin, Lortabs), oxycodone (e.g., OxyContin, Percocet) and medications with other active ingredients. In addition, 21 percent of adults with a prescription and 14 percent of adults without a prescription did not know the active ingredient.

Findings from the survey suggest that the majority of adults with a prescription had leftover medication. Among those with leftover medication, most either kept it (69 percent) or disposed of it (28 percent). Secure storage and proper disposal of unused medication is an important public health issue because it can reduce access to unintended users and reduce the environmental threat to natural resources.

While prescription opioid medication is commonly used to manage pain, the active ingredients in the medication have highly addictive properties structurally similar to heroin. It is recommended using the medication as directed by a physician in order to avoid addiction and possible overdose. Findings from the survey found that 5 percent of those with a prescription did not use as directed and 4 percent of all adults used pain medication for recreation or non-medical use. Based on the overwhelming and escalating prescription drug abuse problem facing Ohio, these figures are likely under-reported. See Tables 10a-d for more detailed information about self-reported prescription medication use.

<b>Table 3.10 Most common pain medications reported by active ingredient<sup>1</sup></b>		
<b>Active ingredient</b>	<b>With a prescription</b>	<b>Without a prescription</b>
<b>Hydrocodone</b>	34%	31%
<b>Oxycodone</b>	20%	29%
<b>Other drug</b>	18%	16%
<b>Don't know</b>	21%	14%

<sup>1</sup>Source: Ohio BRFSS, ODH, 2010

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 7a. Number of deaths resulting from unintentional drug poisoning by year, Ohio, 2000-2010**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	411	555	702	658	904	1,020	1,261	1,351	1,475	1,423	1,544
<b>Sex</b>											
Males	287	364	454	443	604	654	828	871	937	898	989
Females	124	191	248	215	300	366	433	480	538	525	555
<b>Age</b>											
< 1 yr	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1-4 yrs	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
5-14 yrs	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
15-24 yrs	15	54	58	88	103	103	109	120	117	104	138
25-34 yrs	72	90	124	128	147	204	234	258	306	332	345
35-44 yrs	168	204	249	183	275	282	268	364	374	370	381
45-54 yrs	116	157	195	183	280	318	412	449	461	434	463
55-64 yrs	22	23	46	33	65	81	108	125	163	137	183
65-74 yrs	6	9	14	12	16	13	12	22	28	24	19
75-84 yrs	6	10	12	11	10	12	7	6	15	13	7
85 or older	<5	7	<5	17	6	<5	<5	5	6	5	6
<b>Race/Ethnicity</b>											
White‡	332	435	574	552	748	875	1,076	1,172	1,292	1,253	1,377
Black‡	73	97	107	92	140	124	173	165	160	145	141
Hispanic	<5	17	12	<5	12	18	<5	11	16	20	23
Other‡	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 7b. Death rates per 100,000 resulting from unintentional drug poisoning, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	3.6	4.9	6.2	5.8	7.9	8.9	11.0	11.7	12.8	12.5	13.4	1.0
<b>Sex‡</b>												
Males	5.2	6.5	8.2	7.9	10.7	11.6	14.7	15.4	16.5	15.9	17.5	1.3
Females	2.1	3.2	4.2	3.6	5.1	6.2	7.4	8.1	9.1	9.1	9.5	0.8
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*	*	*
5-14 yrs	*	*	*	*	*	*	*	*	*	*	*	*
15-24 yrs	*	3.4	3.7	5.5	6.5	6.5	6.9	7.6	7.5	6.6	8.8	*
25-34 yrs	4.8	6.0	8.4	8.7	10.0	13.9	16.0	17.6	20.8	22.5	23.3	2.0
35-44 yrs	9.3	11.5	14.3	10.7	16.4	17.1	22.6	22.8	24.0	24.3	25.1	1.7
45-54 yrs	7.4	9.6	11.8	10.9	16.5	18.5	23.7	25.6	26.3	24.7	26.4	2.1
55-64 yrs	2.2	2.2	4.2	2.9	5.5	6.7	8.6	9.6	12.2	9.9	13.2	1.1
65-74 yrs	*	*	*	*	*	*	*	2.8	3.4	2.9	*	*
75-84 yrs	*	*	*	*	*	*	*	*	*	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*	*	*
<b>Race/Ethnicity†</b>												
White‡	3.4	4.5	6.0	5.8	7.8	9.1	11.3	12.3	13.5	13.4	14.6	1.2
Black‡	6.1	7.8	8.6	7.3	11.1	9.5	13.2	12.3	12.0	10.7	10.3	0.5
Hispanic	*	*	*	*	*	*	*	*	*	*	8.0	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 deaths

†Age adjusted to 2000 U.S. standard population

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 8a. Number of hospitalization resulting from unintentional drug poisonings, by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	1,685	1,948	2,141	2,312	2,726	2,805	2,706	2,711	2,700
<b>Sex</b>									
Males	838	1,012	1,013	1,134	1,400	1,350	1,299	1,317	1,324
Females	847	1,014	1,128	1,178	1,326	1,455	1,407	1,394	1,376
<b>Age</b>									
0-4 yr	122	141	125	136	159	191	196	174	95
5-14 yrs	64	54	65	47	43	56	75	48	39
15-24 yrs	224	280	291	286	345	313	293	326	322
25-34 yrs	174	229	236	294	319	360	316	370	356
35-44 yrs	324	340	377	396	455	439	418	383	409
45-54 yrs	288	351	416	457	578	569	570	564	568
55-64 yrs	158	192	210	254	361	343	365	367	427
65-74 yrs	154	145	193	223	219	244	229	235	220
75-84 yrs	122	155	162	139	165	201	167	169	189
85 or older	55	61	66	80	82	89	77	75	75

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 8b. Hospitalization rates per 100,000 resulting from drug unintentional poisonings, by year, Ohio, 2002-2010<sup>1</sup>**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	14.0	16.6	17.6	19.0	22.5	23.0	22.4	22.2	22.1	1.0
<b>Sex†</b>										
Males	14.0	16.6	16.8	18.9	23.3	22.5	21.7	21.8	21.9	1.0
Females	14.1	16.8	18.7	19.4	21.9	23.9	23.3	22.9	22.5	1.1
<b>Age</b>										
0-4 yr	16.3	18.9	16.8	18.4	21.6	25.8	25.9	23.8	18.9	0.8 (NL)
5-14 yrs	4.0	3.4	4.1	3.0	2.8	3.7	4.4	4.1	2.6	<-0.1 (NL)
15-24 yrs	14.2	17.6	18.2	18.0	21.8	19.9	19.3	19.7	20.4	0.6
25-34 yrs	11.8	15.6	16.2	20.2	21.9	24.6	23.7	24.0	26.0	1.7
35-44 yrs	18.6	19.9	22.5	24.0	28.0	27.5	26.0	27.1	27.0	1.1
45-54 yrs	17.5	21.0	24.5	26.6	33.3	32.6	32.2	31.9	32.5	1.9
55-64 yrs	14.6	17.1	18.0	20.9	28.7	26.4	26.7	25.6	27.7	1.7
65-74 yrs	20.0	18.9	25.1	29.1	28.5	31.2	29.9	28.5	28.5	1.2
75-84 yrs	22.1	27.9	29.1	25.1	30.0	37.0	34.0	31.9	32.9	1.3
85 or older	29.1	31.1	32.9	38.7	38.2	40.0	42.4	37.4	27.3	0.5 (NL)

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 8c. Number of hospitalizations resulting from unintentional drug poisonings, by drug type, Ohio, 2002-2010**

Drug/medication	2002-2006		2007-2010		Change
	N	Annual Ave	N	Annual Ave	
All opioids	2,936	587	3,555	889	51%
Prescription opioid	2,785	557	3,364	841	51%
Alcohol	2,041	408	2,091	523	28%
Benzodiazepines	1,707	341	1,991	498	46%
Cocaine	1,534	307	1,226	307	0%
Tranquilizers	1,006	201	1,149	287	43%
Methadone	436	87	756	189	117%
Heroin	430	86	531	133	54%
Barbituates	393	79	407	102	29%

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 9a. Number of ED visits resulting from unintentional drug poisonings, by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	4,125	4,662	5,072	5,638	6,352	6,581	6,893	7,025	7,172
<b>Sex</b>									
Males	1,954	2,165	2,347	2,651	3,070	3,121	3,315	3,429	3,525
Females	2,171	2,497	2,725	2,987	3,282	3,460	3,578	3,596	3,647
<b>Age</b>									
< 1 yr	101	89	81	108	117	128	130	129	97
1-4 yr	1,178	1,235	1,304	1,437	1,669	1,803	1,833	1,786	1,538
5-14 yrs	270	299	321	370	401	390	420	370	363
15-24 yrs	708	876	887	954	1,067	992	1,077	1,149	1,284
25-34 yrs	472	539	574	685	748	795	846	970	1,090
35-44 yrs	478	533	641	634	674	694	740	706	748
45-54 yrs	361	436	487	572	672	668	704	759	826
55-64 yrs	181	245	302	352	382	416	504	507	540
65-74 yrs	183	187	229	227	247	324	292	298	313
75-84 yrs	153	166	185	225	277	270	242	252	276
85 or older	40	57	61	74	98	101	105	99	101

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 9b. ED visit rates per 100,000 resulting from unintentional drug poisonings, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	36.8	41.5	45.1	50.1	56.6	58.7	61.3	62.3	64.0	3.5
<b>Sex†</b>										
Males	35.2	39.0	42.3	47.8	55.6	56.5	59.7	61.6	63.8	3.8
Females	38.2	43.7	47.9	52.2	57.4	60.7	62.8	62.9	63.9	3.3
<b>Age</b>										
< 1 yr	68.6	60.4	54.3	73.7	79.0	84.4	85.2	87.3	69.8	2.6
1-4 yr	195.8	206.5	219.0	241.8	284.3	306.7	310.1	301.8	264.3	13.5
5-14 yrs	16.7	18.7	20.3	23.8	26.1	25.7	28.1	24.8	23.8	1.1
15-24 yrs	44.7	54.9	55.6	59.9	67.4	63.0	68.5	73.4	80.9	3.8
25-34 yrs	32.0	36.8	39.3	47.0	51.4	54.4	57.8	65.6	77.3	5.2
35-44 yrs	27.4	31.2	38.3	38.5	41.5	43.6	47.6	46.4	50.5	2.7
45-54 yrs	21.9	26.1	28.7	33.3	38.7	38.2	40.2	43.3	47.4	3.0
55-64 yrs	16.7	21.8	25.8	29.0	30.4	32.0	37.8	36.6	37.2	2.6
65-74 yrs	23.7	24.3	29.8	29.6	32.1	41.4	36.2	35.7	36.8	1.8
75-84 yrs	27.7	29.9	33.3	40.6	50.4	49.7	45.2	46.5	51.0	2.9
85 or older	21.2	29.1	30.4	35.8	45.6	45.4	45.9	43.5	43.8	2.9

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

**Table 9c. Number of ED visits resulting from unintentional drug poisonings, by type of drug and year, Ohio, 2002-2010**

Drug	2002	2003	2004	2005	2006	2007	2008	2009	2010	2002-2006	2007-2010	Change
										Annual Ave.	Annual Ave.	
Barbituates	46	39	38	52	38	53	61	60	53	43	57	33%
Alcohol	275	295	336	333	386	349	371	381	408	325	377	16%
Benzodiazepines	339	353	450	513	553	568	654	675	641	442	635	44%
Cocaine	117	62	80	127	153	128	136	85	90	108	110	2%
Heroin	104	138	157	221	268	294	361	472	641	178	442	149%
Methadone	40	69	125	159	257	320	401	465	712	130	475	265%
Prescription opioid	384	515	539	671	434	753	880	952	1,049	509	909	79%
All opioid	456	609	647	765	832	934	1,099	1,239	1,467	662	1185	79%
Tranquilizers	238	255	335	348	472	510	582	568	567	330	557	69%

Source: Ohio Hospital Association

**Table 10a. Prevalence of prescription pain medication use in last 12 months among adults 18 or older, Ohio, 2010**

	<b>N</b>	<b>Percent</b>	<b>95% CI</b>
Overall	2,041	31.7	(30.0-33.3)
Male	677	27.8	(25.2-30.4)
Female	1,364	35.2	(33.1-37.3)
18-24	34	29.5	(18.9-40.0)
25-34	136	31.0	(25.7-36.3)
35-44	250	28.1	(24.4-31.8)
45-54	435	33.8	(30.5-37.0)
55-64	565	35.1	(32.1-38.2)
65 or older	621	32.8	(30.1-35.4)
Married or unmarried couple	1,035	29.4	(27.4-31.4)
Widow, divorce, or separated adult	763	39.3	(36.2-42.4)
Never married	238	33.2	(28.0-38.4)
Employed	815	26.2	(24.1-28.4)
Not employed	142	33.6	(27.0-40.2)
Other	1,079	41.0	(38.3-43.7)
Did not graduate from HS	210	52.2	(45.2-59.2)
HS grad/GED	686	32.2	(29.3-35.1)
Some college	602	37.3	(33.8-40.8)
College graduate	538	23.2	(20.7-25.7)
Below poverty	235	45.2	(38.7-51.7)
Above poverty < 200%	454	39.3	(35.2-43.3)
Above poverty ≥ 200%	1,072	27.2	(25.2-29.2)
Missing household/income	279	30.9	(26.2-35.5)
Metropolitan	1,268	32.1	(29.9-34.3)
Suburban	296	29.1	(25.2-32.9)
Rural	201	30.5	(25.9-35.2)
Appalachian	259	35.8	(31.2-40.5)

Source: Ohio Behavioral Risk Factor Surveillance System

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 10b. Prevalence of prescription pain medication use among adults age 18 or older who have used with a prescription in last 12 months, by drug used, Ohio, 2010**

	N	2010 Ohio BRFSS	
		Percent	95% CI
Hydrocodone	607	33.6	(30.6-36.6)
Oxycodone	355	19.8	(17.3-22.3)
Other prescription drug	388	18.4	(16.0-20.7)
Tramadol	128	5.9	(4.4-7.3)
Propoxyphene	144	5.2	(4.1-6.3)
Tylenol with codeine	75	3.8	(2.7-4.9)
Codeine	38	2.3	(1.3-3.2)
Morphine	39	1.4	(0.7-2.2)
Hydromorphone	15	0.9	(0.3-1.5)
Methadone	14	0.6	(0.3-1.0)
Fentanyl	12	0.5	(0.2-0.9)
Meperidine	10	0.4	(0.1-0.7)
Don't know or refused	473	20.7	(18.3-23.1)

Source: Ohio Behavioral Risk Factor Surveillance System

**Table 10c. Prevalence of pain medication use among adults ages 18 or older who have used and not been prescribed in last 12 months, by drug used, Ohio, 2010**

	N	2010 Ohio BRFSS	
		Percent	95% CI
Hydrocodone	38	31.4	(19.4-43.4)
Oxycodone	35	28.7	(17.5-39.9)
Other prescription drug	25	15.9	(8.0-23.8)
Tylenol with codeine	12	5.9	(1.8-10.0)
Tramadol	7	4.1	(0.0-9.0)
Propoxyphene	7	4.1	(0.0-9.2)
Morphine	<5	3.7	(0.0-8.7)
Codeine	6	2.0	(0.0-3.9)
Hydromorphone	0	0.0	-
Methadone	0	0.0	-
Fentanyl	0	0.0	-
Meperidine	0	0.0	-
Don't know or refused	21	14.3	(4.0-24.6)

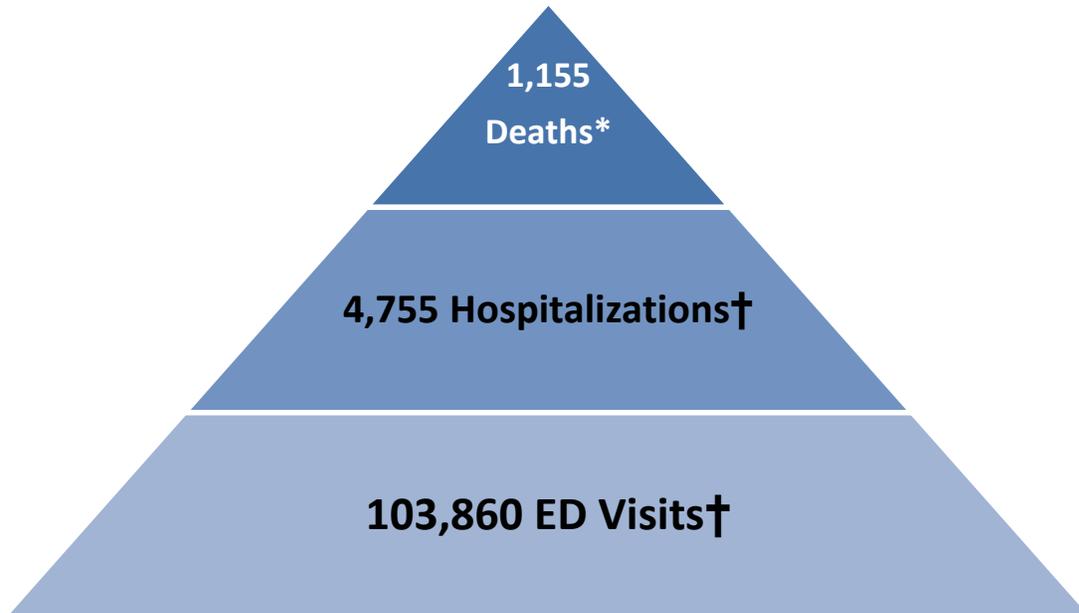
Source: Ohio Behavioral Risk Factor Surveillance System

**Table 10d. Prevalence of dispersion methods among prescription pain medication users who had medication leftover from last prescription by dispersion type, Ohio 2010**

	2010 Ohio BRFSS		
	<b>N</b>	<b>Percent</b>	<b>95% CI</b>
Kept it	723	68.8	(64.6-73.0)
Disposed of it	246	28.0	(24.0-32.1)
Gave it someone else	12	1.8	(0.5-3.0)
Other	10	0.7	(0.2-1.3)
Sold it	<5	0.6	(0.0-1.9)

Source: Ohio Behavioral Risk Factor Surveillance System

## SECTION 3.2: MOTOR VEHICLE TRAFFIC CRASHES



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS

†SOURCE: OHIO HOSPITAL ASSOCIATION

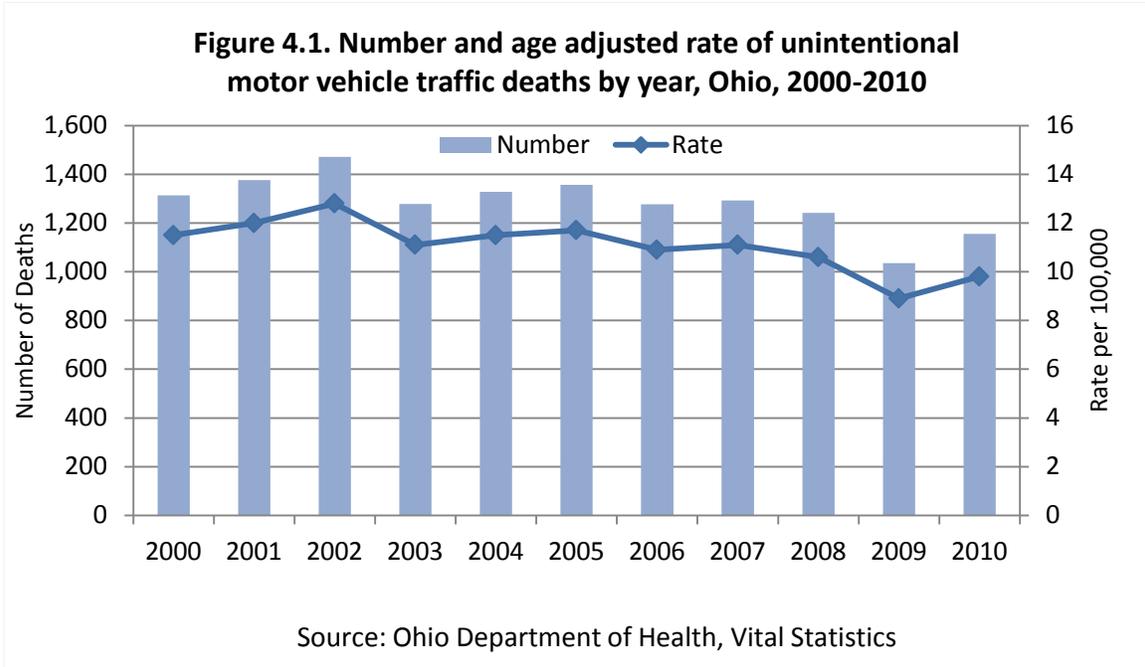
### CHAPTER HIGHLIGHTS:

#### Patterns:

- Motor vehicle crashes were one of the leading causes of fatal and non-fatal unintentional injuries.
- Males were more likely to experience fatal injury and hospitalization than females.
- Young drivers and older adults were most likely to experience an injury.
- Most adults reported regular seat belt use while less than half of high school students reported regular seat belt use.

#### Trends:

- Death and hospitalization rates are on the decline while ED visit rates increased slightly.
- Fatal and non-fatal injury rates have decreased the most among ages 15-34.
- Percentage of adults who reported always using their seat belt increased from 76 percent in 2002 to 83 percent in 2010. These self-reported data are consistent with observational seat belt use data as well.



**DEATHS:**

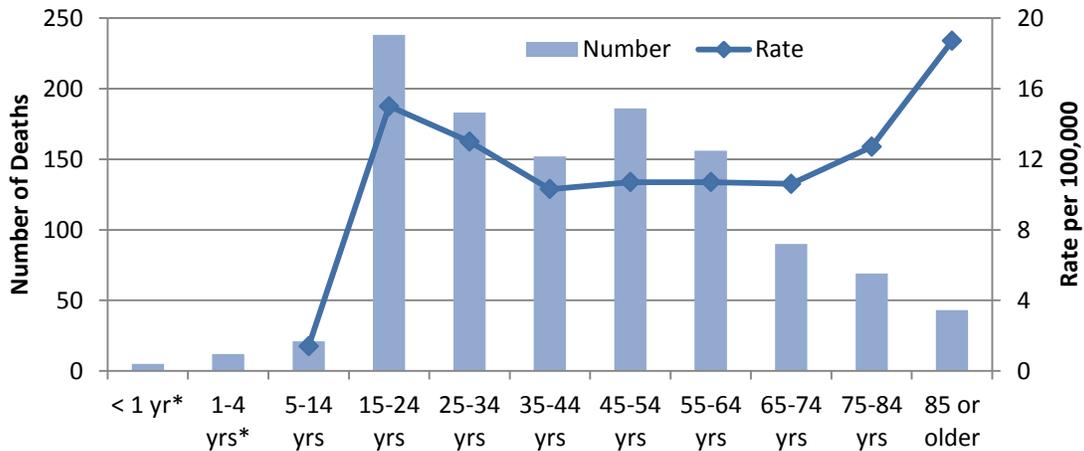
In 2010, 1,155 deaths resulted from unintentional motor vehicle traffic crashes. The fatality rate was 9.8 per 100,000 (Figure 4.1). Fatality rates among males were nearly three times higher than females (14.7 compared to 5.7 per 100,000). The largest number of deaths occurred among ages 15-24 years while the highest rates of fatalities were found among adults age 85 or older (Figure 4.2). Motor vehicle traffic fatalities varied by race and ethnic groups. The highest rates were found among white, non-Hispanics (10.1 per 100,000) followed by Hispanics (8.3 per 100,000) and black, non-Hispanics (8.2 per 100,000). See Table 4.1 for an unintentional motor vehicle traffic death risk profile.

	2010 At Risk Groups	Annual trend since 2000
Overall		-15%
Sex	Males	Similar for males and females
Age	85 or older	15-24 (largest decrease)
Race and ethnicity	Whites	Whites (largest decrease)

**TRENDS:**

Fatalities resulting from unintentional motor vehicle traffic crashes decreased 15 percent from 11.5 per 100,000 in 2000 to 9.8 per 100,000 in 2010. The average decrease was -0.3 deaths per 100,000 per year. The decrease in death rates was similar among males and females. Decreases were found in several age groups with the largest decrease among ages 15-24 (-0.8 per 100,000 per year). Rates among ages 25-34, 45-74, and 85 or older did not follow a linear trend. Decreases in rates were found among whites (-0.3 per 100,000 per year) while rates among blacks did not follow a consistent pattern. See Tables 11a-b located at the end of this section for more detailed information about the number and rates of unintentional motor vehicle crashes in Ohio.

**Figure 4.2. Number and rates of unintentional motor vehicle traffic related death rates by age group, Ohio, 2010**

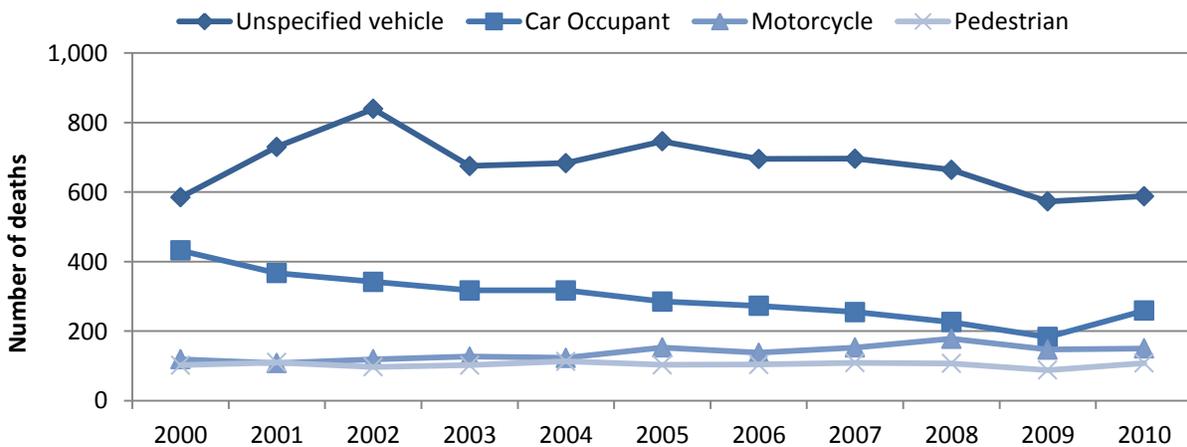


Source: Ohio Department of Health, Vital Statistics  
 \*Rate suppressed due to fewer than 20 deaths

**PERSON INJURED:**

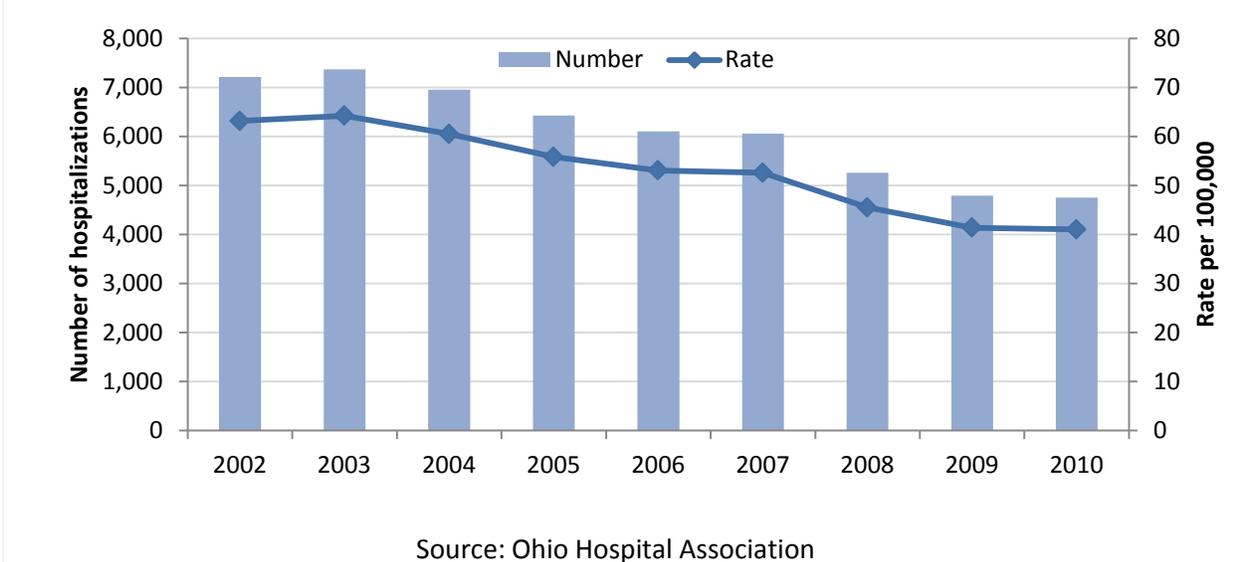
In 2010, the person injured in approximately one-half (588 deaths) was unspecified. The most common specified fatally injured persons were car occupants (259 deaths), motorcyclists (150 deaths), and pedestrians (108 deaths) (see Table 11c). The number of car occupant deaths decreased by 20 deaths per year while deaths of motorcyclists increased by 5 per year. The number of deaths with an unspecified person and pedestrian deaths did not follow a consistent trend. See Table 11c located at the end of this section for more detailed information on the number of persons fatally injured in motor vehicle traffic crashes in Ohio.

**Figure 4.3. Number of deaths resulting from unintentional motor vehicle traffic related injury by the person injured, year, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

**Figure 4.4. Number and age adjusted rate of hospitalizations for unintentional motor vehicle traffic related injury by year, Ohio, 2002-2010**



**HOSPITALIZATIONS:**

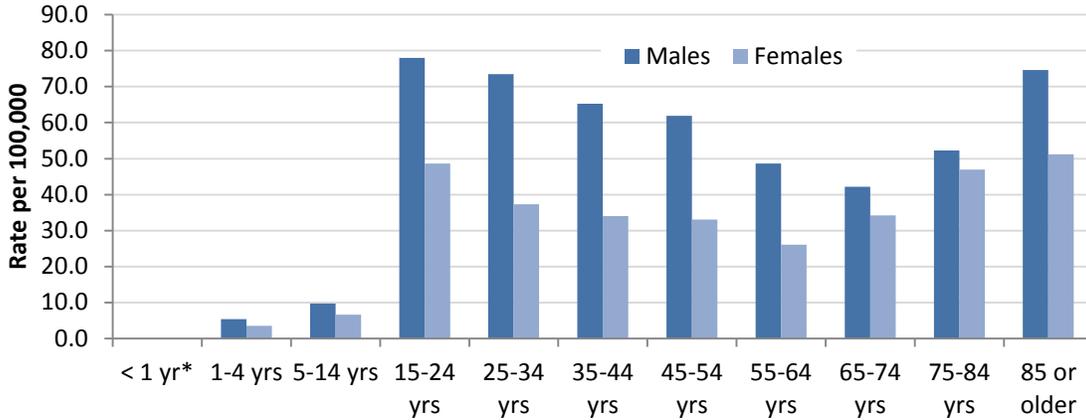
Nearly 4,800 inpatient hospitalizations resulted from unintentional motor vehicle traffic-related injury in Ohio in 2010. The motor vehicle traffic related hospitalization rate was 41 per 100,000 (Figure 4.4). The hospitalization rate was higher for males (52 per 100,000) compared to females (30 per 100,000). The highest rates were found among individuals 15-24 years (64 per 100,000) and 25-34 years (55 per 100,000). The lowest rates were found among children 14 years of age or less (Figure 4.5). See Table 4.2 for an unintentional motor vehicle traffic crash hospitalization risk profile.

Table 4.2 Unintentional Motor Vehicle Traffic Crash Hospitalization Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		-34%
Sex	Males	Males (largest decrease)
Age	15-24	15-24 (largest decrease)

**TRENDS:**

As with deaths, hospitalizations resulting from unintentional motor vehicle traffic-related injury decreased 34 percent from 63 per 100,000 in 2002 to 41 per 100,000 in 2010. The average decrease was 3 hospitalizations per 100,000 per year. The decrease in hospitalizations was slightly higher among males (4 per 100,000) than females (3 per 100,000). Hospitalization rates decreased among ages 15 and older with the largest decrease occurring among ages 15-24 (7 per 100,000). See Tables 12a-b located at the end of this section for more detailed information on the number and rate of unintentional motor vehicle traffic crash hospitalizations.

**Figure 4.5. Hospitalization rates from unintentional motor vehicle traffic crashes by age group and sex, Ohio, 2010**



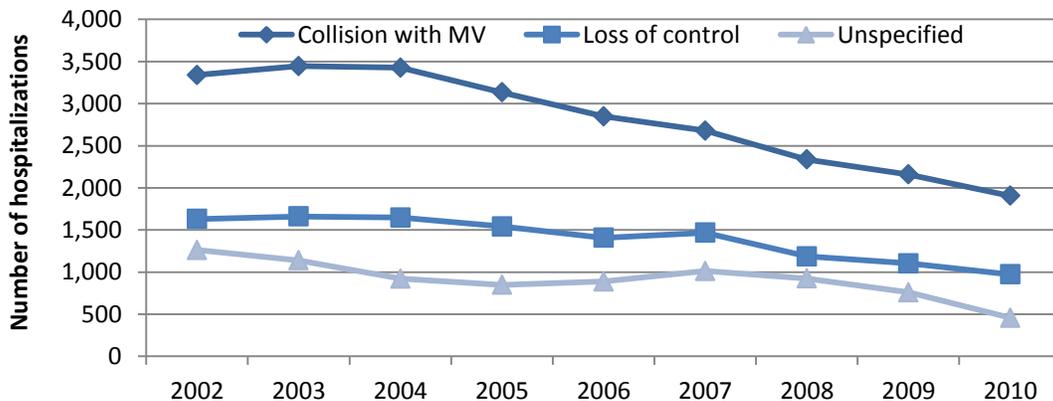
Source: Ohio Hospital Association

\*Rate suppressed due to fewer than 20 Hospitalizations

**NATURE OF CRASH:**

The most common causes of motor vehicle traffic hospitalizations were a collision with another motor vehicle, loss of control (not on a highway), and a traffic crash of an unspecified nature. These categories combined account for nearly 75 percent of hospitalizations associated with motor vehicle traffic crashes each year. The number of hospitalizations for each of these categories has decreased from 2002 - 2010 with the largest decreases associated with collisions with other motor vehicles (204 per year). Hospitalizations resulting from motor vehicle traffic crashes associated with loss of control, not on highway (88 per year), and unspecified nature (70 per year) also experienced more modest decreases during this time period (Figure 4.6). See table 12c located at the end of this section for more detailed information on the number of hospitalizations by nature of traffic crash.

**Figure 4.6. Number of hospitalizations resulting from unintentional motor vehicle traffic crashes by nature of crash, Ohio, 2002-2010**



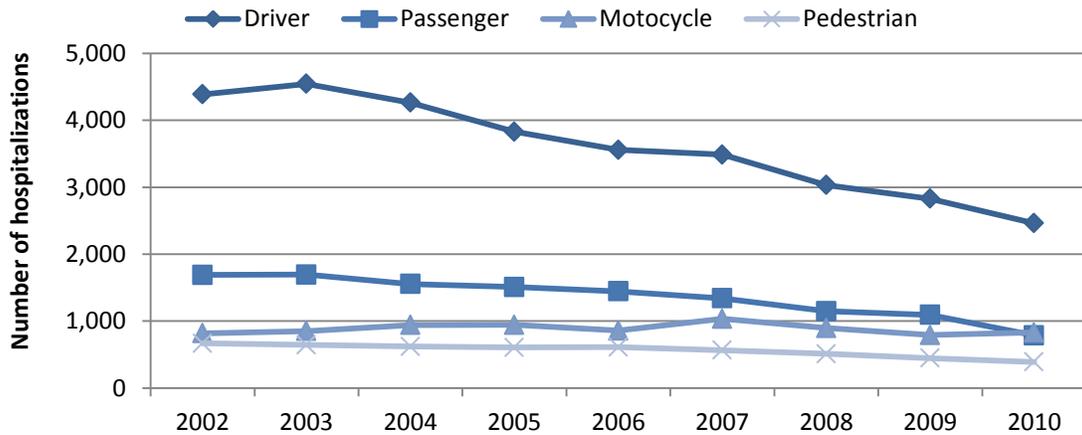
Source: Ohio Hospital Association

**PERSON INJURED:**

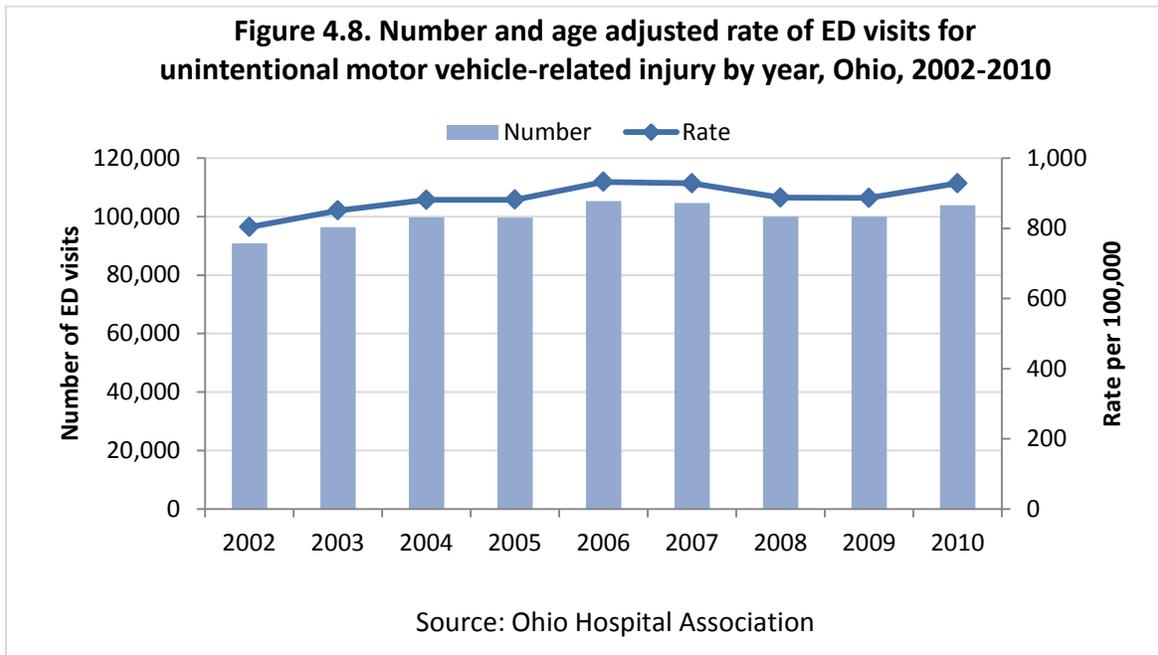
In 2010, most hospitalizations after a motor vehicle traffic crash were occupants of the vehicle. Approximately one-half of hospitalizations were the driver of the vehicle and nearly one in five were passengers in the vehicle or a motorcycle driver or passenger. Eight percent of the hospitalizations involved pedestrians injured in motor vehicle traffic crashes (Figure 4.7).

The decrease in motor vehicle traffic hospitalizations has been driven by decreases in hospitalizations among drivers (261 per year), passengers (107 per year), and pedestrians (33 per year). See tables 12d located at the end of this section for more detailed information on the number of persons injured in motor vehicle traffic related hospitalizations.

**Figure 4.7. Number of hospitalizations resulting from unintentional motor vehicle traffic crashes by the person injured, Ohio, 2002-2010**



Source: Ohio Hospital Association



**EMERGENCY DEPARTMENT VISITS:**

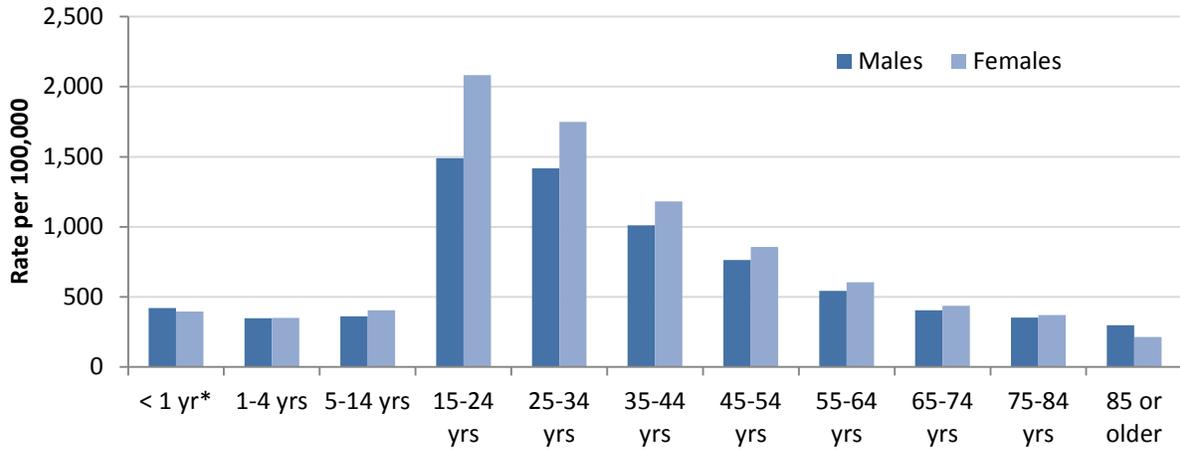
Approximately 104,000 emergency department (ED) visits resulted from unintentional motor vehicle traffic crash-related injury in 2010. The ED visit rate was 928 per 100,000 (Figure 4.8). The rate of unintentional motor vehicle traffic ED visits was higher among females (1,019 per 100,000) compared to males (839 per 100,000). ED visit rates were similar among children and teens ages 14 or younger but increased dramatically among driving-aged youth ages 15-24. Rates decreased with age among adults 25 or older (Figure 4.9). See Table 4.3 for an unintentional motor vehicle traffic crash ED visit risk profile.

	<b>2010 At Risk Groups</b>	<b>Annual trend since 2002</b>
<b>Overall</b>		+16%
<b>Sex</b>	Females	Females (largest increase)
<b>Age</b>	15-44	25-34 (largest increase)

**TRENDS:**

Since 2002, the rate of ED visits resulting from motor vehicle traffic crash-related injury increased from 803 per 100,000 in 2002 to 928 per 100,000 in 2010. The average annual increase was 11 per 100,000 per year. Rates increased 14 per 100,000 annually among females while rates did not follow a linear trend for males. The largest increase in annual rates was found among adults ages 25-34. See Tables 13a and 13b located at the end of this section for more detailed information on the number and rate of unintentional motor vehicle traffic crash ED visits.

**Figure 4.9. ED visit rates per 100,000 resulting from unintentional motor vehicle traffic crash-related injury by age group and sex, Ohio, 2010**

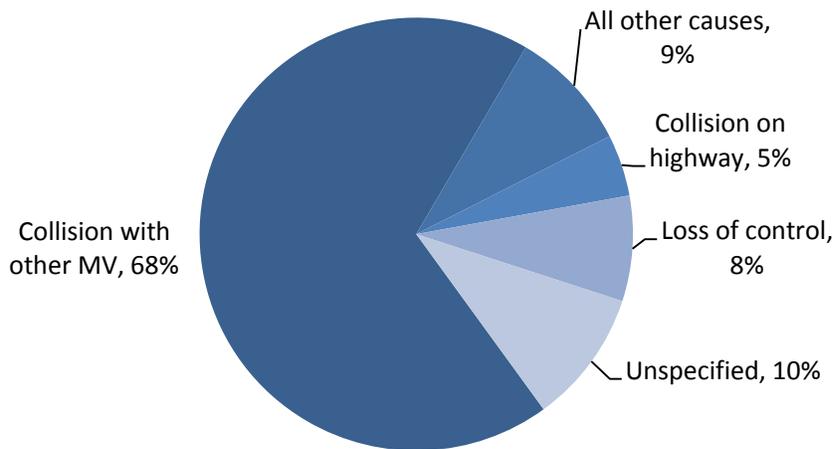


Source: Ohio Hospital Association

**NATURE OF CRASH:**

The most common causes of motor vehicle traffic crash-related ED visits were collision with another motor vehicle (68 percent), loss of control (8 percent), and collision on a highway (5 percent). These coding categories combined account for 81 percent of ED visits associated with motor vehicle traffic crashes each year. The number of ED visits associated with collisions on highways and collisions with pedestrians increased, but the other types of crashes did not follow a linear trend. See Table 13c located at the end of this section for more detailed information on the number and percentage of ED visits by nature of motor vehicle traffic crashes.

**Figure 4.10. Distribution of ED visits resulting from motor vehicle traffic crashes by nature of crash, Ohio, 2010**

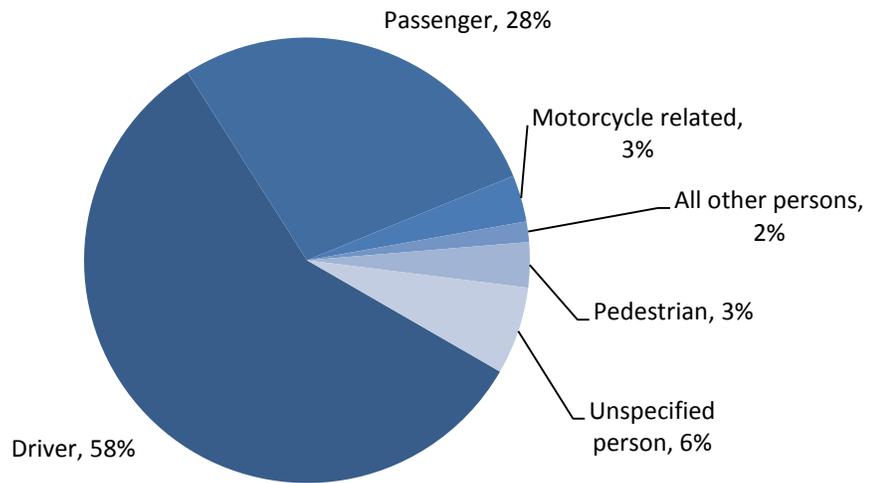


Source: Ohio Hospital Association

**PERSON INJURED IN CRASH:**

Most motor vehicle traffic-related ED visits involved an injury to either the driver (58 percent) or the passenger (28 percent) of the motor vehicle. In addition, 6 percent of ED visits were associated with an injury to an unspecified person and 3 percent were associated with injuries to pedestrians and persons riding a motorcycle. The largest increases in the number of ED visits were among passengers (378 per year), motorcyclists (119 per year), and pedestrians (97 per year). See Table 13d located at the end of this section for more detailed information on the number and percentage of persons injured in motor vehicle ED visits.

**Figure 4.11. Distribution of ED visits resulting from motor vehicle traffic crashes by person injured, Ohio, 2010**



Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 11a. Number of deaths resulting from unintentional motor vehicle traffic crash-related injury by year, Ohio, 2000-2010**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	1,314	1,376	1,471	1,279	1,328	1,357	1,277	1,293	1,242	1,036	1,155
<b>Sex</b>											
Males	868	938	982	845	931	902	880	899	882	695	803
Females	446	438	489	434	397	455	397	394	360	341	352
<b>Age</b>											
< 1 yr	<5	7	<5	<5	<5	<5	<5	<5	5	5	5
1-4 yrs	16	12	9	18	12	9	7	11	12	9	12
5-14 yrs	63	44	52	42	42	41	37	16	34	19	21
15-24 yrs	316	334	366	317	370	301	285	304	248	205	238
25-34 yrs	205	214	229	190	181	230	200	226	187	154	183
35-44 yrs	225	232	234	200	184	217	171	197	177	157	152
45-54 yrs	153	191	194	160	214	187	207	164	212	181	186
55-64 yrs	103	110	119	126	98	137	142	156	162	113	156
65-74 yrs	97	95	108	81	82	99	98	74	87	83	90
75-84 yrs	97	110	112	98	101	98	80	104	80	85	69
85 or older	37	27	46	45	40	38	47	37	38	25	43
<b>Race/Ethnicity†</b>											
White‡	1,133	1,231	1,286	1,109	1,159	1,183	1,120	1,116	1,079	890	988
Black‡	139	112	139	126	128	120	128	130	129	114	118
Hispanic	28	24	34	30	23	32	13	29	30	19	26
Other‡	13	8	7	8	12	13	14	16	<5	12	22

†Non-Hispanic

Source: ODH Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 11b. Death rates per 100,000 resulting from unintentional motor vehicle traffic crash-related injury, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	11.5	12.0	12.8	11.1	11.5	11.7	10.9	11.1	10.6	8.9	9.8	-0.3
<b>Sex†</b>												
Males	16.1	17.1	17.9	15.4	16.7	16.3	15.7	16.1	15.6	12.3	14.1	-0.3
Females	7.5	7.2	8.1	7.2	6.5	7.5	6.5	6.5	5.9	5.5	5.7	-0.2
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*	*	*
5-14 yrs	3.8	2.7	3.2	2.6	2.7	2.6	2.4	*	2.3	*	1.4	*
15-24 yrs	20.3	21.3	23.1	19.9	23.3	19.0	18.1	19.3	15.8	13.1	15.0	-0.8
25-34 yrs	13.5	14.4	15.5	12.9	12.3	15.6	13.7	15.4	12.7	10.4	13.0	-0.2 (NL)
35-44 yrs	12.5	13.0	13.4	11.7	11.0	13.1	10.5	12.3	11.3	10.3	10.3	-0.2
45-54 yrs	9.7	11.7	11.8	9.6	12.6	10.9	11.9	9.4	12.1	10.3	10.7	0.0 (NL)
55-64 yrs	10.2	10.7	11.0	11.2	8.4	11.3	11.3	12.0	12.1	8.2	10.7	0.0 (NL)
65-74 yrs	12.3	12.2	14.0	10.5	10.7	12.9	12.7	9.4	10.7	9.9	10.6	-0.3 (NL)
75-84 yrs	17.9	20.0	20.1	17.5	18.0	17.5	14.3	18.7	14.6	15.7	12.7	-0.6
85 or older	20.8	14.9	24.9	23.6	20.6	19.0	22.7	17.2	17.2	11.0	18.7	-0.5 (NL)
<b>Race/Ethnicity†</b>												
White‡	11.7	12.6	13.2	11.4	11.9	12.1	11.4	11.4	10.9	9.1	10.1	-0.3
Black‡	10.9	8.6	10.5	9.6	9.5	9.0	9.4	9.4	9.7	8.5	8.2	-0.2 (NL)
Hispanic	13.7	12.9	14.5	14.4	7.6	13.1	*	10.6	10.7	*	8.3	*
Other‡	*	*	*	*	*	*	*	*	*	*	9.6	*

\*Rates suppressed due to less than 20.

†Age adjusted to 2000 U.S. standard population

‡Non-Hispanic

NL: Interpret with caution because trend does not follow linear pattern

Source: ODH Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 11c: Number of unintentional motor vehicle deaths, by occupant injured and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Pedestrian	102	110	97	102	113	103	104	109	107	88	108	9%	<-1 (NL)
Pedal cycle	13	11	15	7	14	11	18	19	14	16	11	1%	*
Motorcycle	119	108	119	127	123	153	138	153	178	147	150	13%	5
3 wheeled vehicle	0	0	0	0	0	0	0	0	0	0	0	0%	*
Car	432	367	342	317	317	285	273	255	226	183	259	22%	-19
Pickup truck or van	51	46	47	43	42	47	39	45	42	27	27	2%	-2
Heavy transport vehicle	12	4	12	7	21	12	9	15	10	2	7	1%	*
Bus	0	0	0	1	1	0	1	1	1	0	5	0%	*
Other or unspecified vehicle	585	730	839	675	683	746	695	696	664	573	588	51%	-10 (NL)

NL: Interpret with caution because trend does not follow linear pattern

Source: ODH Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 12a. Number of hospitalization resulting from unintentional motor vehicle traffic crash-related injury, by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	7,215	7,369	6,953	6,428	6,102	6,055	5,257	4,792	4,755
<b>Sex</b>									
Males	4,364	4,371	4,187	3,900	3,702	3,755	3,211	2,894	2,921
Females	2,851	2,998	2,766	2,528	2,400	2,300	2,046	1,898	1,834
<b>Age</b>									
< 1 yr	<5	<5	<5	<5	<5	<5	<5	<5	<5
1-4 yrs	77	53	68	74	82	59	56	59	26
5-14 yrs	323	312	267	293	350	324	300	212	125
15-24 yrs	1,858	1,880	1,679	1,550	1,439	1,361	1,144	1,044	1,008
25-34 yrs	1,196	1,186	1,124	1,022	975	1,025	823	770	780
35-44 yrs	1,265	1,252	1,185	1,016	944	921	785	743	733
45-54 yrs	978	1,036	1,064	971	915	940	842	754	822
55-64 yrs	566	655	621	619	587	596	561	531	537
65-74 yrs	399	436	382	385	353	376	309	297	322
75-84 yrs	401	409	424	373	334	314	308	269	266
85 or older	146	143	132	114	115	129	121	107	135

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 12b. Hospitalization rates per 100,000 resulting from unintentional motor vehicle traffic crash-related injury, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per year)
Overall†	63.2	64.2	60.5	55.8	53.1	52.6	45.5	41.4	41.0	-3.2
<b>Sex†</b>										
Males	78.8	78.6	75.1	69.7	66.1	67.1	57.3	51.4	52.0	-3.8
Females	47.9	50.2	46.3	42.3	40.3	38.5	34.1	31.7	30.4	-2.6
<b>Age</b>										
< 1 yr	*	*	*	*	*	*	*	*	*	*
1-4 yrs	12.8	8.9	11.4	12.5	14.0	10.0	9.5	10.0	4.5	-0.6 (NL)
5-14 yrs	20.0	19.5	16.9	18.9	22.8	21.4	20.0	14.2	8.2	-0.9 (NL)
15-24 yrs	117.4	117.9	105.2	97.3	91.0	86.4	72.8	66.7	63.5	-7.4
25-34 yrs	81.1	80.9	76.9	70.1	66.9	70.1	56.2	52.1	55.3	-3.8
35-44 yrs	72.5	73.4	70.7	61.7	58.2	57.8	50.5	48.9	49.5	-3.5
45-54 yrs	59.4	62.0	62.7	56.5	52.7	53.8	48.1	43.0	47.2	-2.3
55-64 yrs	52.2	58.2	53.1	51.0	46.7	45.9	42.1	38.3	37.0	-2.5
65-74 yrs	51.7	56.7	49.8	50.3	45.9	48.1	38.3	35.5	37.9	-2.4
75-84 yrs	72.5	73.6	76.3	67.3	60.8	57.8	57.6	49.6	49.1	-3.5
85 or older	77.3	73.0	65.9	55.1	53.5	58.0	52.9	47.0	58.6	-2.9

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 12c. Number of unintentional motor vehicle traffic hospitalizations by nature of collision and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per year)
<b>Nature of Collision</b>											
Collision with train	55	65	43	12	32	17	18	11	6	*	*
Re-entrant collision with other MV	15	30	16	11	8	7	<5	7	<5	*	*
Collision with other MV	3,339	3,445	3,427	3,133	2,849	2,678	2,337	2,160	1,907	40.1%	-204
Collision with other non-motor vehicle	240	233	205	201	237	227	263	235	276	5.8%	5 (NL)
Collision with pedestrian	576	587	565	562	556	511	462	405	361	7.6%	-28
Collision on highway	700	793	726	668	596	602	577	550	542	11.4%	-29
Loss of control, not on highway	1,630	1,660	1,648	1,541	1,408	1,468	1,187	1,103	973	20.5%	-88
Noncollision while boarding or alighting	64	76	84	59	62	58	39	66	36	0.8%	-4 (NL)
Other noncollision	287	327	288	308	295	284	246	229	194	4.1%	-13
Unspecified	1,263	1,140	922	848	889	1,013	924	759	457	9.6%	-70

\*Suppressed due to less than 20 hospitalizations

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 12d. Number of unintentional motor vehicle traffic hospitalizations by person injured and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Person Injured</b>											
Driver	4,387	4,545	4,265	3,828	3,558	3,486	3,033	2,828	2,463	51.8%	-261
Passenger	1,690	1,695	1,555	1,510	1,444	1,341	1,149	1,093	787	16.6%	-107
Motorcyclists	817	852	941	944	859	1035	896	792	830	17.5%	-2 (NL)
Street care occupant	<5	0	<5	<5	<5	<5	<5	5	<5	*	*
Occupant of animal drawn vehicle	6	<5	<5	5	7	8	8	0	8	*	*
Pedal cyclist	112	122	112	112	141	126	165	110	107	2.3%	1 NL
Pedestrian	667	644	621	607	611	566	511	447	391	8.2%	-33
Other specified person	62	55	42	35	41	27	36	32	29	0.6%	-4
Unspecified person	371	361	310	301	267	274	257	218	139	2.9%	-25

\*Rates suppressed due to less than 20 hospitalizations

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 13a. Number of ED visits resulting from unintentional motor vehicle traffic crash-related injury by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	90,873	96,350	99,747	99,644	105,304	104,675	99,927	99,984	103,862
<b>Sex</b>									
Males	41,513	43,766	45,184	45,278	47,731	47,686	45,399	45,089	46,463
Females	49,360	52,584	54,563	54,366	57,573	56,989	54,528	54,895	57,397
<b>Age</b>									
< 1 yr	405	450	550	452	555	565	579	563	568
1-4 yrs	1,872	1,858	1,806	1,852	2,008	2,055	2,046	2,169	2,029
5-14 yrs	6,006	6,207	6,194	6,177	6,692	6,300	6,185	5,955	5,832
15-24 yrs	28,482	30,405	30,733	30,112	30,914	29,734	27,665	27,893	28,278
25-34 yrs	18,110	19,032	20,065	20,292	21,230	21,571	20,779	20,867	22,332
35-44 yrs	15,181	15,726	16,070	16,271	16,763	17,016	15,849	15,524	16,230
45-54 yrs	10,507	11,501	12,238	12,495	13,878	14,021	13,725	13,452	14,131
55-64 yrs	5,246	5,798	6,321	6,397	7,186	7,352	7,421	7,696	8,350
65-74 yrs	2,832	3,018	3,282	3,169	3,438	3,424	3,363	3,416	3,593
75-84 yrs	1,830	1,911	2,026	2,021	2,119	2,086	1,811	1,943	1,963
85 or older	402	444	462	406	521	551	504	506	556

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 13b. ED visit rates per 100,000 resulting from unintentional motor vehicle traffic crash-related injury by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Trend (per yr)</b>
Overall	803	851	881	882	932	928	887	886	928	11.1
<b>Sex</b>										
Males	744	782	808	810	854	854	813	807	839	8.4 (NL)
Females	863	920	954	954	1,011	1,004	963	968	1,019	13.9
<b>Age</b>										
< 1 yr	275	305	369	309	375	373	379	381	409	14.1
1-4 yrs	311	311	303	312	342	350	346	367	349	7.4
5-14 yrs	372	388	392	398	436	416	413	398	383	2.3 (NL)
15-24 yrs	1,800	1,906	1,926	1,890	1,954	1,889	1,760	1,782	1,782	13.0 (NL)
25-34 yrs	1,227	1,298	1,373	1,392	1,458	1,476	1,420	1,412	1,584	32.4
35-44 yrs	870	921	959	987	1,033	1,068	1,019	1,021	1,097	23.5
45-54 yrs	638	688	722	728	799	802	784	767	811	18.8
55-64 yrs	484	515	541	527	572	566	557	555	575	9.2
65-74 yrs	367	393	428	414	447	438	417	409	423	4.5 (NL)
75-84 yrs	331	344	365	365	386	384	339	358	363	2.3 (NL)
85 or older	213	227	230	196	243	248	220	222	241	2.2 (NL)

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 13c. Number of ED visits from motor vehicle traffic crash-related injury by nature of crash and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Nature of crash</b>											
Collision with train	149	392	38	48	334	111	71	61	57	0%	-21 (NL)
Re-entrant collision with other MV	106	196	40	94	139	58	85	50	51	0%	-10 (NL)
Collision with other MV	60,018	65,249	68,369	68,119	71,058	69,413	65,801	67,364	70,334	68%	729 (NL)
Collision with other non-motor vehicle	2,748	1,766	1,887	1,823	2,206	2,665	2,652	2,948	3,159	3%	126 (NL)
Collision with pedestrian	2,355	2,437	2,503	2,659	3,168	3,057	3,088	2,972	2,880	3%	87.9
Collision on highway	3,110	4,112	4,040	4,249	4,149	4,765	5,109	4,720	4,730	5%	182.6
Loss of control	7,915	8,456	8,634	9,324	8,894	9,095	8,928	8,000	8,089	8%	-5 (NL)
Noncollision while boarding or alighting	953	856	843	877	1,121	1,216	1,203	1,128	1,061	1%	38 (NL)
Other noncollision	2,211	2,082	2,205	2,319	2,722	2,873	2,792	3,025	3,231	3%	144 (NL)
Unspecified	11,324	10,813	11,191	10,135	11,528	11,427	10,204	9,726	10,270	10%	-136 (NL)

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

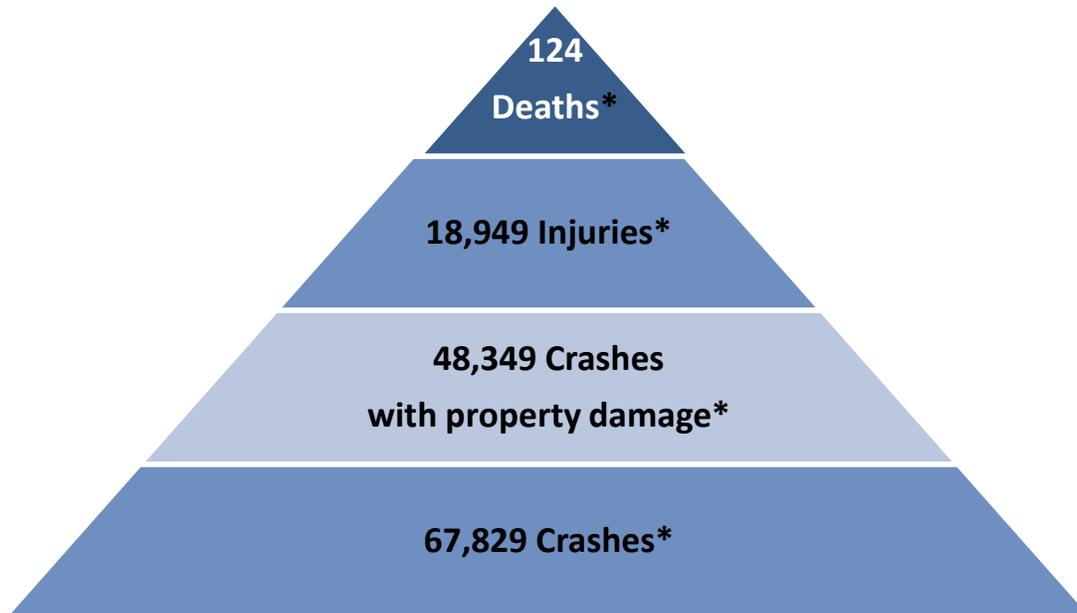
Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 13d. Number of ED visits from motor vehicle traffic crash-related injury by person injured and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Person injured</b>											
Driver	53,187	56,713	58,693	58,653	60,369	60,330	57,037	56,815	59,948	58%	428 (NL)
Passenger	25,429	26,427	27,357	27,193	29,063	28,725	27,522	28,627	28,983	28%	378
Motorcyclist	2,248	2,618	3,022	3,184	3,325	3,603	3,581	3,072	3,244	3%	115
Passenger of motorcyclist	216	237	245	321	281	327	637	323	334	0%	25 (NL)
Occupant of streetcar	51	21	24	29	35	24	23	31	34	0%	-1 (NL)
Animal related	21	17	24	29	43	41	22	25	32	0%	1 (NL)
Pedal cyclist	860	854	830	907	1,039	1,094	1,097	1,069	1,079	1%	37.4
Pedestrian	2,593	2,692	2,727	2,951	3,408	3,388	3,335	3,277	3,198	3%	97
Other specified person	294	348	416	319	303	317	292	361	354	0%	0.5 (NL)
Unspecified person	5,870	5,903	6,400	6,060	7,244	6,831	6,664	6,394	6,656	6%	99 (NL)

Source: Ohio Hospital Association

## SECTION 3.2A: TEEN DRIVERS



\*SOURCE: OHIO TRAFFIC CRASH STATISTICS, 2011

While the number of injuries treated in health care facilities has decreased over the past decade, motor vehicle traffic crashes among teen drivers remains a public health and safety issue. In 2011, nearly 290,000 motor vehicle traffic crashes were reported to the Ohio Department of Public Safety. Of these crashes, 67,829 or 14 percent involved drivers ages 16-20. The crashes ranged in severity with 124 resulting in death, nearly 19,000 resulting in injury, and approximately 48,000 resulting in property damage. Teen drivers were disproportionately involved in crashes compared to all other age groups. Teenage males were more likely to be involved in a crash than females.

### RISK FACTORS

There are many well-known factors that raise a driver's risk of being killed or injured in a crash:

- **Speed** – Among Ohio drivers of all age groups in 2010:
  - 156 fatal crashes were caused by speeding or driving at unsafe speeds.
  - 5,306 crashes resulting in injuries were caused by speeding or driving at unsafe speeds.
  - 9,376 crashes resulting in property damage were caused by speeding or driving at unsafe speeds.
- **Alcohol** - Among Ohio drivers ages 16-20 in 2010:
  - 36 fatal crashes were caused by alcohol impaired drivers.
    - 91 percent of fatal crashes involved a driver ages 16-20 with a blood alcohol concentration of 0.08 or higher.

Ohio Violence and Injury Prevention Program, Ohio Department of Health

- 7 percent of high school students in Ohio reported driving a car or other vehicle when they had been drinking alcohol in 2011. No differences in the percentage of students reporting episodes of drinking and driving were found by sex while students in grade 12 were more likely to drive after drinking alcohol (13 percent) than students in grade 10 (4 percent).
- **Lack of seat belt use** -
  - Only 29 percent of occupants aged 16-20 who were killed in traffic crashes were restrained.
  - 10 percent of high school students in Ohio reported “never” or “rarely” wearing a seat belt when driving a car. Males were more likely to “never” or “rarely” wear a seat belt (13 percent) than females (6 percent). No differences were found by grade level.
- **Driving at night** – The fatal crash rate of 16-year-olds is nearly twice as high at night.<sup>1</sup>
- **Driver distractions** such as talking on a cell phone and carrying multiple peer passengers are risky. Teen passengers and cell phones are two distractions proven to kill teens.<sup>2</sup> Two or more peer passengers more than triples the risk of a fatal crash with a teen at the wheel.<sup>3</sup> The risk is not just for the driver. Most teen passengers who die in crashes are riding with a teen driver.

**REFERENCES:**

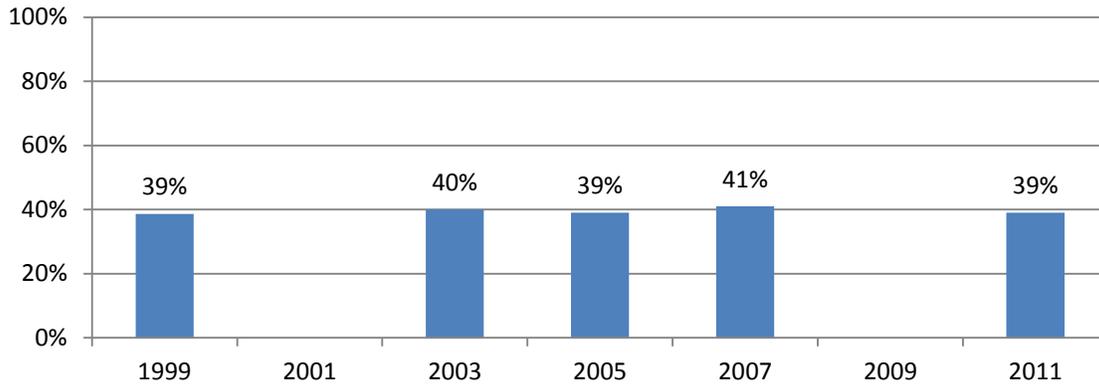
<sup>1</sup> Insurance Institute for Highway Safety (IIHS). Beginning Teenage Drivers. 2007. Available at: [http://www.iihs.org/brochures/pdf/beginning\\_drivers.pdf](http://www.iihs.org/brochures/pdf/beginning_drivers.pdf). Accessed April 7, 2010.

<sup>2</sup> Winston FK, et al. Eds. Driving Through the Eyes of Teens, A Closer Look. Published by The Children’s Hospital of Philadelphia and State Farm Insurance Companies®. 2009

<sup>3</sup> Teen Driver Source, Children’s Hospital of Philadelphia website [http://www.teendriversource.org/support\\_gov](http://www.teendriversource.org/support_gov)

## SECTION 3.2B: YOUTH SEAT BELT USE

**Figure 4.12. Percentage of high school students who reported always wearing a seatbelt when riding in a motor vehicle, Ohio, 1999, 2003, 2005, 2007, and 2011**



Source: Ohio Youth Risk Behavior Survey

### SELF REPORTED SEAT BELT USE:

Approximately 4 in 10 high school students reported “always” using a seat belt when they ride in a motor vehicle in 2011 (Figure 4.12). Reported seat belt use was similar for males (37 percent) and females (41 percent). Reported seat belt use increased by grade level with students in grade 12 (44 percent) being more likely to “always” use seat belts than students in grade 9 (35 percent). White students (42 percent) were more likely report “always” using a seat belt than African American (27 percent) or Hispanic (30 percent) students.

### TRENDS IN SEAT BELT USE:

The percentage of high school students who “always” reported wearing a seat belt has not changed since 1999. Seat belt use patterns by sex, grade, race or ethnicity did not change during the period. See Tables 4a-b located on the following page for more detailed information on the reported seat belt use among high school students in Ohio.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 14a. Percentage of high school students who reported seat belt when they ride in a vehicle by frequency, Ohio, 1999, 2003, 2005, 2007, and 2011**

	1999	2001	2003	2005	2007	2009	2011
<b>Frequency of Seat Belt Use</b>							
Always	38.6%	NA	40.1%	38.9%	40.8%	NA	38.5%
Most of the time	30.1%		28.5%	29.4%	28.9%		30.7%
Sometimes	15.5%		16.0%	15.1%	16.0%		14.1%
Rarely	10.4%		9.9%	10.5%	10.1%		11.0%
Never	5.4%		5.6%	6.0%	4.2%		5.8%

NA: Did not receive sufficient response rate for weighted data

Source: Ohio Youth Risk Behavior Survey

**Table 14b. Percentage of high school students who reported always wearing a seat belt when they ride in a vehicle, Ohio, 1999, 2003, 2005, 2007, 2011**

	1999	2001	2003	2005	2007	2009	2011
Overall	38.6%	NA	40.1%	38.9%	40.8%	NA	38.5%
<b>Sex</b>							
Males	32.6%		38.4%	35.8%	37.5%		36.6%
Females	44.9%		42.2%	42.1%	44.3%		40.5%
<b>Grade</b>							
9th	35.9%		32.5%	35.5%	32.1%		34.7%
10th	38.1%		39.2%	36.9%	42.2%		39.7%
11th	38.9%		41.3%	41.7%	43.8%		37.7%
12th	42.6%		48.2%	42.4%	47.6%		43.9%
<b>Race/Ethnicity</b>							
White, non-Hispanic	40.5%		44.0%	42.6%	42.9%		42.2%
Black, non-Hispanic	30.8%		*	20.0%	28.5%		26.5%
Hispanic	*		*	*	38.1%		30.0%

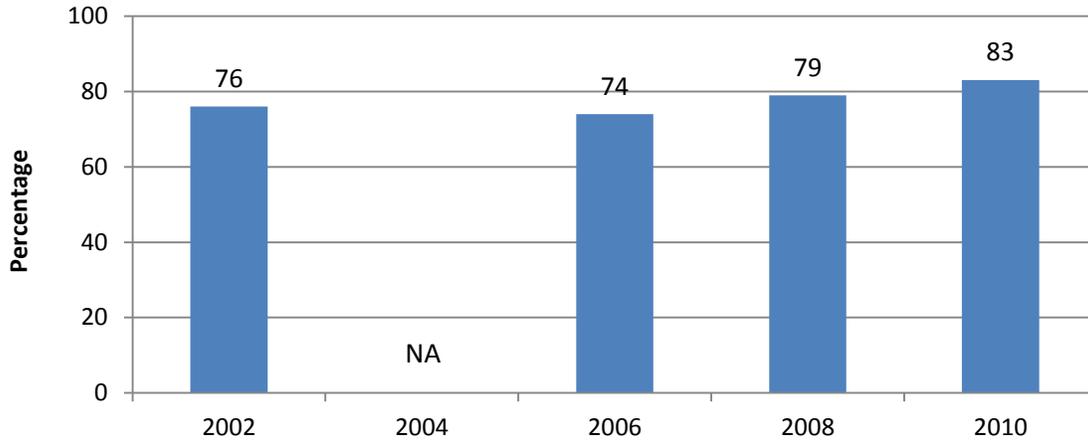
\*Percentage suppressed due to few than 100 respondents in subgroup.

NA: Did not receive sufficient response rate for weighted data

Source: Ohio Youth Risk Behavior Survey

## SECTION 3.2c: ADULT SEAT BELT USE

**Figure 4.13. Percentage of adults who reported always using a seat belt when riding in a motor vehicle, Ohio, 2002, 2006, 2008 and 2010**



Source: Ohio Behavioral Risk Factor Surveillance System

### SELF REPORTED SEAT BELT USE:

Approximately 8 in 10 adults reported “always” using a seat belt when they ride in a motor vehicle in 2010 (Figure 4.13). Several important patterns were found in frequent seat belt use. Females were more likely to report “always” wearing a seat belt (86 percent) compared to males (79 percent). Adults ages 55 or older were more likely to report “always” wearing a seat belt than adults ages 44 or younger. No differences were found by education, household poverty, employment, or marital status.

### TRENDS:

The percentage of adults who reported “always” using a seat belt increased from 76 percent in 2002 to 83 percent in 2010 (Figure 4.13). Significant increases were observed in both males and females as well as adults aged 35 or older, completing post secondary education, household incomes well above poverty, married couples, and currently employed. See Tables 15a-b located on the following page for more details about self-reported seat belt use among adult Ohioans.

## Burden of Injury in Ohio, 2000-2010

### Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 15a. Prevalence of seat belt use among adults ages 18 or older by frequency of use, Ohio, 2002-2010**

	2002		2006		2008		2010	
	Percent	95% CI*						
Always	76.3	(74.7-77.9)	74.0	(71.5-76.4)	78.8	(77.7-80.0)	82.6	(81.2-84.0)
Nearly Always	10.3	(9.2-11.5)	14.2	(12.3-16.1)	11.8	(10.9-12.7)	8.8	(7.8-9.9)
Sometimes	6.0	(5.1-6.9)	6.1	(4.8-7.4)	4.6	(4.0-5.2)	4.0	(3.3-4.7)
Seldom	3.0	(2.4-3.7)	2.7	(1.8-3.7)	2.2	(1.8-2.6)	2.0	(1.5-2.5)
Never	4.1	(3.4-4.8)	2.8	(1.7-4.0)	2.3	(1.9-2.8)	2.5	(1.8-3.1)
Never ride in a car	0.2	(0.1-0.4)	0.1	(0.0-0.2)	0.2	(0.0-0.3)	0.1	(0.1-0.2)

Source: Ohio Behavioral Risk Factor Surveillance System

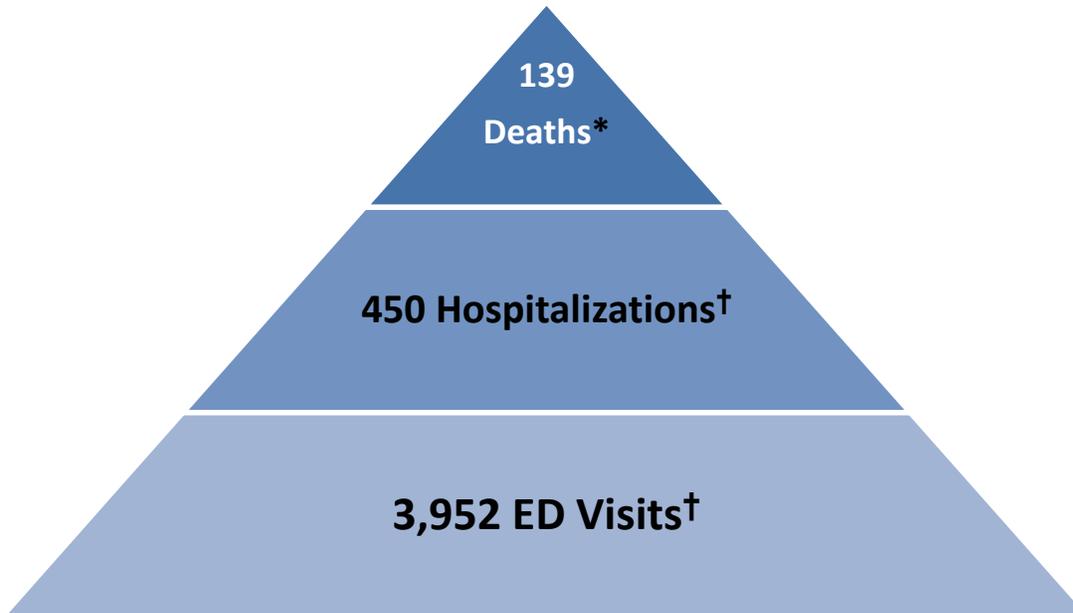
**Table 15b. Prevalence of adults ages 18 or older who reported always using a seat belt, Ohio, 2002-2010**

	2002		2006		2008		2010	
	Percent	95% CI*						
<b>Sex</b>								
Males	72.2	(69.6-74.7)	69.0	(64.9-73.0)	73.6	(71.7-75.5)	79.0	(76.6-81.4)
Females	80.0	(78.1-81.9)	78.5	(75.7-81.4)	83.6	(82.4-84.9)	85.9	(84.4-87.4)
<b>Age Group</b>								
18-24	69.3	(63.2-75.5)	70.3	(59.8-80.8)	70.9	(65.3-76.5)	72.7	(63.0-82.4)
25-34	75.4	(71.6-79.2)	68.7	(61.9-75.6)	75.0	(71.5-78.4)	75.2	(70.4-80.0)
35-44	75.1	(71.7-78.4)	70.5	(64.8-76.2)	77.8	(75.3-80.3)	84.3	(81.2-87.3)
45-54	78.6	(75.5-81.7)	73.8	(69.1-78.5)	80.3	(78.3-82.4)	84.2	(81.8-86.7)
55-64	76.7	(72.8-80.6)	80.5	(76.2-84.8)	82.4	(80.6-84.2)	83.3	(81.0-85.7)
65 or older	80.8	(77.4-84.2)	80.2	(76.3-84.0)	84.1	(82.7-85.5)	86.7	(84.9-88.6)
<b>Education Level</b>								
Did not complete HS	71.7	(65.5-77.9)	66.3	(56.5-76.1)	70.2	(65.1-75.3)	74.3	(67.9-80.7)
Completed HS/GED	73.1	(70.5-75.8)	71.9	(67.7-76.0)	74.6	(72.5-76.7)	77.9	(75.2-80.6)
Some college	74.5	(71.3-77.6)	73.8	(69.1-78.4)	79.2	(77.0-81.4)	82.8	(80.2-85.5)
College graduate	84.3	(81.8-86.8)	79.0	(74.8-83.2)	85.3	(83.6-86.9)	88.4	(86.5-90.4)
<b>Poverty Status</b>								
Below poverty	72.2	(66.5-78.0)	68.0	(58.8-77.3)	68.2	(63.3-73.1)	75.4	(70.0-80.8)
Above poverty < 200%	74.6	(71.2-78.1)	75.3	(70.4-80.1)	75.6	(72.7-78.5)	76.5	(72.8-80.2)
Above poverty > 200%	77.5	(75.5-79.4)	74.6	(71.6-77.7)	81.1	(79.8-82.4)	85.4	(83.8-87.0)
Missing household or income information	77.8	(73.2-82.4)	75.8	(68.0-83.5)	80.3	(77.2-83.5)	85.4	(81.8-89.0)
<b>Marital Status</b>								
Married or unmarried couple	78.8	(76.9-80.8)	74.4	(71.4-77.4)	81.1	(79.8-82.4)	84.9	(83.2-86.5)
Separated, widowed or divorced	74.9	(71.7-78.0)	75.5	(71.3-79.7)	77.2	(75.1-79.4)	80.6	(77.8-83.3)
Never married	69.8	(65.5-74.0)	70.7	(63.3-78.1)	72.2	(68.5-76.0)	74.4	(69.6-79.1)
<b>Employment Status</b>								
Employed	75.4	(73.3-77.4)	72.8	(69.6-76.0)	78.4	(76.9-79.9)	82.2	(80.3-84.1)
Not employed	66.7	(58.6-74.8)	56.7	(41.4-72.1)	70.7	(64.6-76.7)	73.1	(66.8-79.5)
Other	79.4	(76.8-82.1)	77.9	(74.1-81.8)	81.0	(79.3-82.7)	85.7	(83.8-87.6)

\*95% CI: 95% confidence interval.

Source: Ohio Behavioral Risk Factor Surveillance System

## SECTION 3.3: PEDESTRIAN INJURIES



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

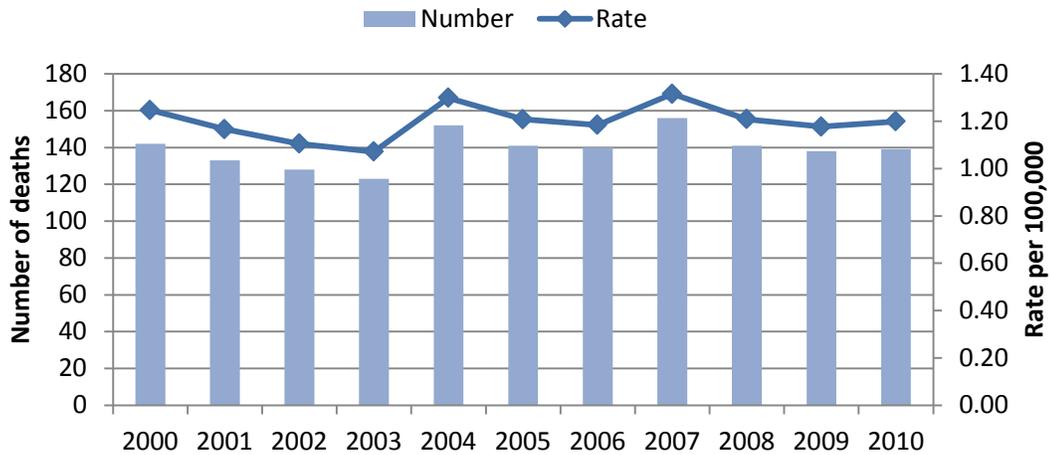
#### Patterns:

- The highest fatality rates were found among adults ages 75-84 and blacks.
- The highest rates of non-fatal pedestrian injuries occurred among youth and adults ages 15-24.
- Most fatal and non-fatal pedestrian injuries resulted from motor vehicle traffic crashes.

#### Trends:

- Death and ED visit rates have largely remained the same over time.
- Hospitalization rates have increased 31 percent since 2002.
- Most fatal and non-fatal pedestrian injuries were associated with motor vehicle traffic crashes throughout the study period.

**Figure 5.1. Number and age adjusted rate of pedestrian deaths by year, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

**DEATHS:**

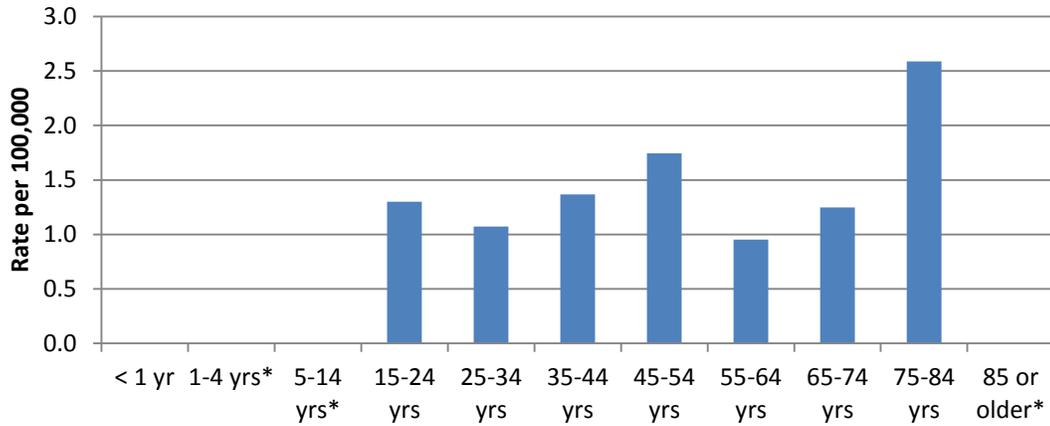
In 2010, 139 deaths resulted from pedestrian injuries. The death rate was 1.2 per 100,000 (Figure 5.1). Death rates were two times higher among males (1.7 per 100,000) compared to females (0.8 per 100,000). The highest death rates were found among adults 75-84 years (2.6 per 100,000) and 45-54 years (1.8 per 100,000) (Figure 5.2). Fatality rates among blacks (2.0 per 100,000) were two times higher than whites (1.1 per 100,000). See Table 5.1 for a pedestrian injury death risk profile. Approximately 80 percent of pedestrian fatalities were associated with motor vehicle traffic and 15 percent were associated with non-traffic situations while 5 percent were unspecified (Figure 5.3).

	2010 At Risk Groups	Annual trend since 2000
Overall		Inconsistent
Sex	Males	Inconsistent
Age	75-84	45-54 (+0.07/100,000)
Race and ethnicity	Blacks	Whites (-0.05/100,000)

**TRENDS:**

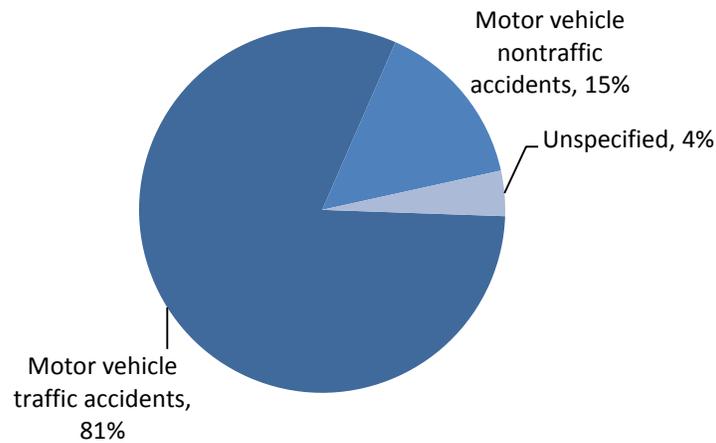
Pedestrian fatality rates decreased slightly from 1.25 per 100,000 in 2000 to 1.20 per 100,000 in 2010 (Figure 5.1). The annual rate changes were inconsistent over time for both males and females. Slight increases were found in average annual rates among ages 45-54 years (0.07 per 100,000 per year) and 15-24 years (0.03 per 100,000 per year) while a slight decrease was found among ages 55-64 years (-0.03 per 100,000 per year). Fatality rates decreased on average by -0.05 per 100,000 per year among whites while rates did not follow a consistent trend among blacks. See Tables 16a-c located at the end of this section for more detailed information on the number and rate of pedestrian deaths in Ohio.

Figure 5.2. Death rates resulting from pedestrian injuries, by age, Ohio, 2009-2010



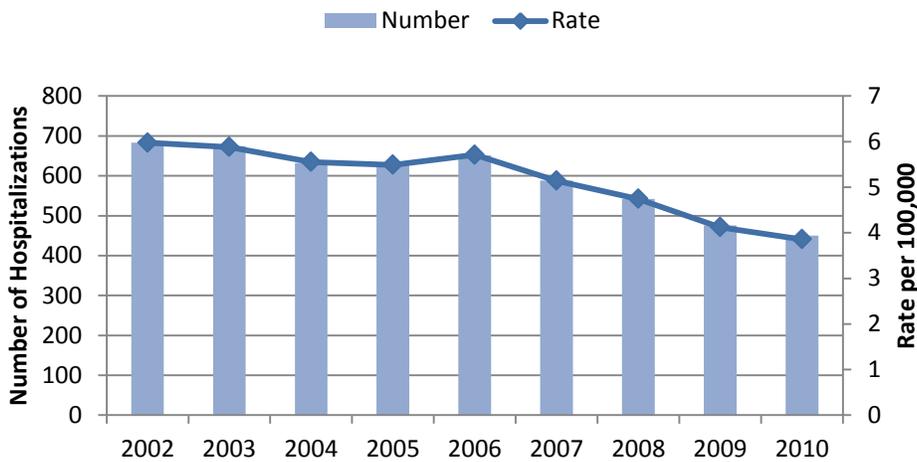
Source: Ohio Department of Health, Vital Statistics  
\*Rates suppress due to small cell sizes

Figure 5.3. Distribution of deathss resulting from pedestrian injuries by cause, Ohio, 2010



Source: Ohio Department of Health, Vital Statistics

**Figure 5.4. Number and age adjusted rate for pedestrian injury hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

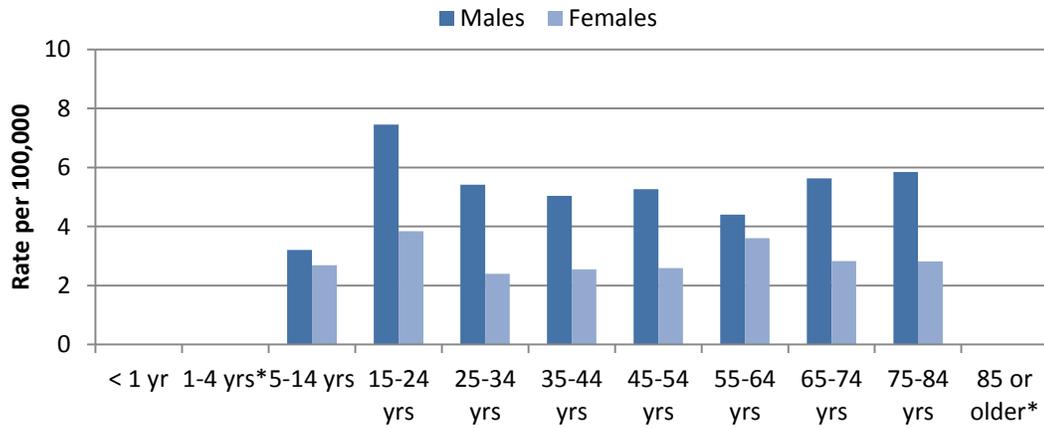
In 2010, 450 hospitalizations resulted from pedestrian injuries. The hospitalization rate was 3.9 per 100,000 (Figure 5.4). Rates among males were two times higher than females (5.6 versus 2.8 per 100,000). For males, hospitalization rates increased from birth through age 24 then decreased among ages 25-34 and leveled off ages 35 or older. For females, hospitalizations were fairly consistent across the lifespan (Figure 5.5). See Table 5.2 for a pedestrian injury hospitalization risk profile. Nearly 90 percent of pedestrian injuries were associated with motor vehicle traffic crashes (Figure 5.6).

Table 5.2 Pedestrian Injury Hospitalization Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		-35%
Sex	Males	Females (largest decrease)
Age	15-24	75-84 and 5-14 (largest decreases)

**TRENDS:**

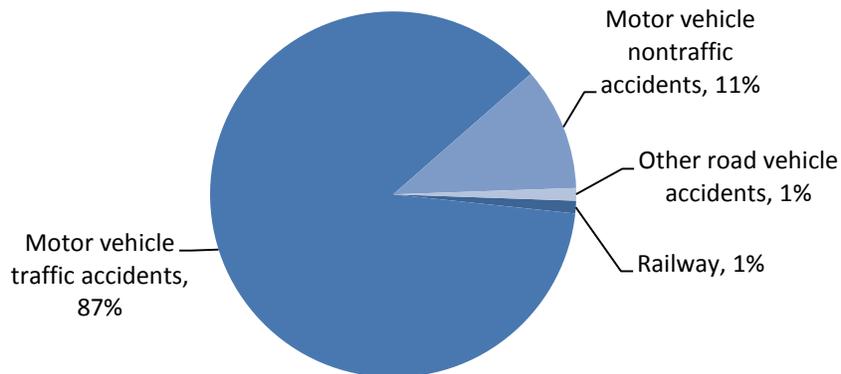
Hospitalization rates decreased from 6.0 per 100,000 in 2010 to 3.9 per 100,000 in 2002 (Figure 5.4). The average annual decrease was -0.2 per 100,000 per year. Rates decreased -0.2 per 100,000 per year among females while rates among males did not follow a consistent trend. Hospitalization rates decreased among all age groups with the largest decreases found among ages 75-84 (0.5 per 100,000 per year) and children ages 5-14 (0.4 per 100,000 per year). The number of hospitalizations associated with motor vehicle traffic crashes decreased 28 per year while non-traffic related hospitalizations did not follow a consistent trend over time. See Tables 17a-c located at the end of this section for more detailed information on unintentional pedestrian injury hospitalizations.

**Figure 5.5. Hospitalization rates resulting from pedestrian injuries, by age and sex, Ohio, 2010**



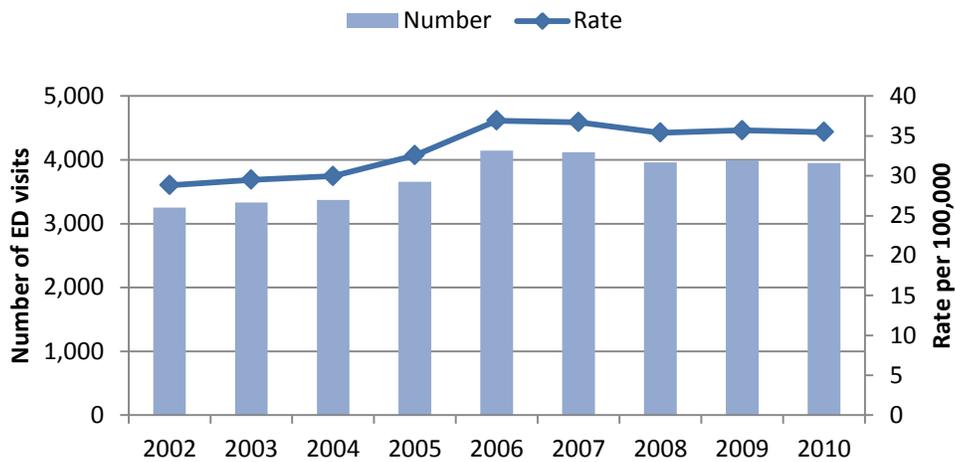
Source: Ohio Hospital Association  
 \*Rates suppress due to small cell sizes

**Figure 5.6. Distribution of hospitalizations resulting from pedestrian injuries by cause, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 5.7. Number and age adjusted rate for pedestrian injury ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

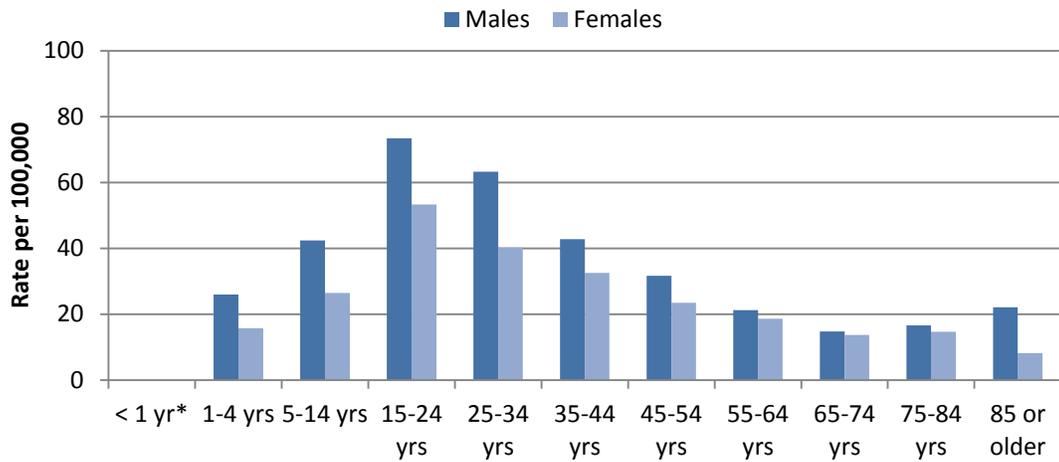
In 2010, roughly 4,000 ED visits resulted from pedestrian injuries. The ED visit rate was 35.5 per 100,000 (Figure 5.7). The rate of ED visits was higher among males (42 per 100,000) than females (29 per 100,000). For both males and females, ED visit rates increased with age from birth through age 24 then steadily decreased after age 25 (Figure 5.8). See Table 5.3 for a pedestrian injury ED visit risk profile. Approximately 81 percent of pedestrian injury related ED visits were associated with motor vehicle traffic crashes. Nearly 12 percent of ED visits were associated with motor vehicle non-traffic crashes and 7 percent involved other road vehicles (Figure 5.9).

	2010 At Risk Groups	Annual trend since 2002
Overall		+24%
Sex	Males	Males (largest increase)
Age	15-24	15-24 (largest increase)

**TRENDS:**

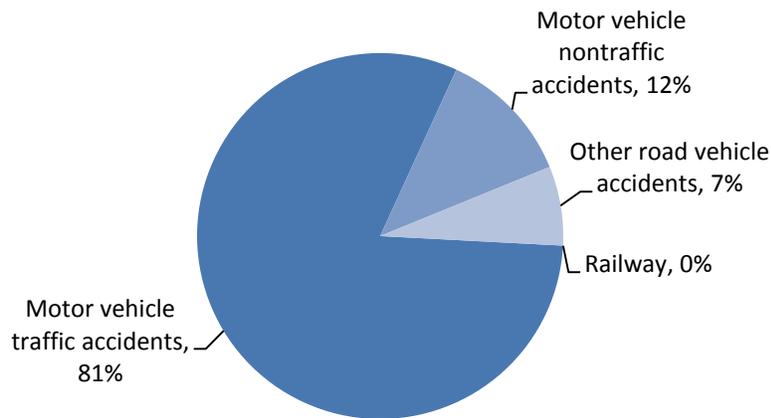
ED visit rates increased from 29 per 100,000 in 2002 to 36 per 100,000 in 2010 (Figure 5.7). The average annual increase was 1.0 per 100,000 per year. The average annual increase was two times higher among males (1.7 per 100,000 per year) than females (0.9 per 100,000 per year). Increases in rates were found among ages 15-64 with the largest increase found among ages 15-24 (2.5 per 100,000 per year). Rates among children and adults ages 65 or older did not follow a linear trend. ED visits resulting from motor vehicle traffic crashes increased on average by 97 ED visits per year. Non-traffic and other road crashes did not follow a consistent trend over time. See Tables 18a-c for more detailed information on the number and rate of ED visits associated with unintentional pedestrian injuries.

**Figure 5.8. ED visit rates resulting from pedestrian injuries by age and sex, Ohio, 2010**



Source: Ohio Hospital Association  
 \*Suppressed due to small cell sizes

**Figure 5.9. Distribution of ED visits resulting from pedestrian injuries by cause, Ohio, 2010**



Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 16a. Number of deaths resulting from unintentional pedestrian injuries, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	142	133	128	123	152	141	140	156	141	138	139
<b>Sex</b>											
Males	90	96	86	84	113	89	94	105	106	94	94
Females	52	37	42	39	39	52	46	51	35	44	45
<b>Age</b>											
< 1 yr	0	0	0	0	0	0	0	0	0	0	0
1-4 yrs	7	6	5	12	9	5	<5	7	6	<5	5
5-14 yrs	21	16	10	12	9	13	9	10	13	9	<5
15-24 yrs	20	17	14	10	27	21	17	22	21	17	24
25-34 yrs	13	18	19	10	13	17	20	17	17	14	17
35-44 yrs	25	24	14	24	18	18	14	16	18	19	22
45-54 yrs	18	14	23	15	26	17	31	28	30	33	28
55-64 yrs	12	15	13	14	17	18	15	19	13	13	14
65-74 yrs	13	9	9	9	8	9	10	13	10	9	12
75-84 yrs	10	12	14	9	20	13	14	18	8	18	10
85 or older	<5	<5	7	8	5	10	6	6	5	<5	<5
<b>Race and ethnicity</b>											
White‡	109	105	102	95	121	106	105	124	111	113	101
Black‡	24	21	19	18	25	26	34	24	25	17	29
Hispanic	9	6	5	10	<5	6	<5	7	5	5	<5
Other‡	0	<5	<5	0	<5	<5	0	<5	0	<5	6

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 16b. Death rates per 100,000 resulting from unintentional pedestrian injuries, by year, Ohio, 2000-2010<sup>1</sup>**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.25	1.17	1.10	1.07	1.30	1.21	1.18	1.32	1.21	1.18	1.20	<0.01 (NL)
<b>Sex†</b>												
Males	1.64	1.75	1.59	1.58	2.06	1.60	1.67	1.88	1.91	1.69	1.66	<0.01 (NL)
Females	0.87	0.61	0.67	0.64	0.64	0.83	0.74	0.82	0.57	0.71	0.75	<-0.01 (NL)
<b>Age</b>												
< 1 yr		0.00		0.00		0.00		0.00		0.00		*
1-4 yrs		*		1.75		*		*		*		*
5-14 yrs		0.96		0.66		0.71		0.76		*		*
15-24 yrs		1.08		1.17		1.20		1.37		1.30		0.03
25-34 yrs		1.11		0.78		1.26		1.16		1.07		0.01 (NL)
35-44 yrs		1.18		1.24		0.98		1.08		1.37		<0.01 (NL)
45-54 yrs		1.13		1.22		1.39		1.65		1.75		0.07
55-64 yrs		1.28		1.35		1.33		1.21		0.95		-0.03
65-74 yrs		1.32		*		*		1.43		1.25		*
75-84 yrs		2.19		2.59		2.42		2.36		2.59		0.03 (NL)
85 or older		*		*		*		*		*		*
<b>Race and ethnicity†</b>												
White‡	1.1	1.1	1.0	1.0	1.2	1.1	1.0	1.2	1.1	1.1	1.1	-0.05
Black‡	1.9	1.6	*	*	1.8	1.8	2.5	1.7	1.9	*	2.0	*
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

**Table 16c. Number of deaths resulting from unintentional pedestrian injuries, by mechanism and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Traffic	105	103	98	101	119	104	104	109	112	96	113	81%	0.5 (NL)
Nontraffic	24	9	23	13	24	29	19	26	22	30	21	15%	*
Unspecified	13	21	7	9	9	8	17	21	7	12	5	4%	*

NL: Interpret with caution because trend does not follow linear pattern

\*Suppressed due to fewer than 20 deaths.

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 17a. Number of hospitalizations resulting from pedestrian injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	683	674	632	628	651	588	542	476	450
<b>Sex</b>									
Males	412	414	411	368	410	368	320	311	281
Females	271	260	221	260	241	220	222	165	169
<b>Age</b>									
< 1 yr	0	0	0	0	0	<5	<5	0	0
1-4 yrs	25	26	23	22	33	22	19	20	10
5-14 yrs	117	100	89	91	97	103	90	59	45
15-24 yrs	118	111	102	103	124	98	87	84	90
25-34 yrs	65	75	76	73	78	67	76	57	55
35-44 yrs	112	104	116	97	91	76	61	65	56
45-54 yrs	85	91	100	85	78	85	91	66	68
55-64 yrs	51	67	42	57	61	64	45	61	58
65-74 yrs	40	47	34	44	34	25	33	25	35
75-84 yrs	54	38	40	38	40	37	26	31	22
85 or older	16	15	10	18	15	9	13	8	11

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 17b. Hospitalization rates per 100,000 resulting from pedestrian injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	6.0	5.9	5.6	5.5	5.7	5.1	4.7	4.1	3.9	-0.26
<b>Sex†</b>										
Males	7.5	4.8	7.4	6.6	7.4	6.6	5.7	5.6	5.0	-0.18 (NL)
Females	4.6	4.3	3.7	4.3	4.1	3.7	3.8	2.8	2.8	-0.20
<b>Age</b>										
< 1 yr	0.0	0.0	0.0	0.0	0.0	*	*	0.0	0.0	*
1-4 yrs	4.2	4.3	3.9	3.7	5.6	3.7	3.2	3.4	*	*
5-14 yrs	7.2	6.3	5.6	5.9	6.3	6.8	6.0	3.9	3.0	-0.37
15-24 yrs	7.5	7.0	6.4	6.5	7.8	6.2	5.5	5.4	5.7	-0.23
25-34 yrs	4.4	5.1	5.2	5.0	5.4	4.6	5.2	3.9	3.9	-0.10 (NL)
35-44 yrs	6.4	6.1	6.9	5.9	5.6	4.8	3.9	4.3	3.8	-0.39
45-54 yrs	5.2	5.4	5.9	4.9	4.5	4.9	5.2	3.8	3.9	-0.19
55-64 yrs	4.7	6.0	3.6	4.7	4.9	4.9	3.4	4.4	4.0	-0.13 (NL)
65-74 yrs	5.2	6.1	4.4	5.7	4.4	3.2	4.1	3.0	4.1	-0.28
75-84 yrs	9.8	6.8	7.2	6.9	7.3	6.8	4.9	5.7	4.1	-0.51
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 hospitalizations

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 17c. Number of hospitalizations resulting from pedestrian injuries by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Railway	<5	6	8	10	<5	5	6	0	5	1%	*
Motor vehicle traffic crashes	617	607	573	576	577	532	488	417	391	87%	-28
Motor vehicle nontraffic crashes	56	53	37	38	59	47	40	51	49	11%	<-1 (NL)
Other road vehicle crashes	6	8	14	13	11	<5	8	8	5	1%	*

\*Suppressed due to less than 20 hospitalizations

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 18a. Number of ED visits resulting from pedestrian injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	3,254	3,332	3,374	3,658	4,144	4,122	3,959	3,988	3,952
<b>Sex</b>									
Males	1,888	1,978	2,018	2,167	2,436	2,405	2,326	2,375	2,293
Females	1,366	1,354	1,356	1,491	1,708	1,717	1,633	1,613	1,659
<b>Age</b>									
< 1 yr	<5	<5	5	<5	5	<5	<5	<5	6
1-4 yrs	148	151	131	147	173	149	130	147	122
5-14 yrs	661	637	637	616	712	682	606	547	527
15-24 yrs	818	807	828	896	989	1,063	1,017	1,072	1,008
25-34 yrs	492	479	542	597	684	706	689	717	729
35-44 yrs	461	488	482	555	568	514	535	555	557
45-54 yrs	343	390	361	424	522	471	516	472	479
55-64 yrs	154	167	195	211	261	286	251	261	290
65-74 yrs	91	114	100	99	107	125	112	131	121
75-84 yrs	70	67	77	83	94	94	68	67	84
85 or older	15	31	16	28	29	29	33	17	29

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 18b. ED visit rates per 100,000 resulting from pedestrian injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	28.8	29.5	30.0	32.6	36.9	36.7	35.4	35.7	35.5	1.0
<b>Sex†</b>										
Males	33.7	24.3	36.2	39.0	43.8	43.2	41.8	42.8	41.6	1.7
Females	23.9	23.7	23.8	26.2	30.1	30.3	29.1	28.6	29.4	0.9
<b>Age</b>										
< 1 yr	*	*	*	*	*	*	*	*	*	*
1-4 yrs	24.6	25.2	22.0	24.7	29.5	25.3	22.0	24.8	21.0	NL
5-14 yrs	40.9	39.9	40.3	39.6	46.4	45.0	40.5	36.6	34.6	NL
15-24 yrs	51.7	50.6	51.9	56.2	62.5	67.5	64.7	68.5	63.5	2.3
25-34 yrs	33.3	32.7	37.1	41.0	47.0	48.3	47.1	48.5	51.7	2.5
35-44 yrs	26.4	28.6	28.8	33.7	35.0	32.3	34.4	36.5	37.6	1.3
45-54 yrs	20.8	23.3	21.3	24.7	30.1	27.0	29.5	26.9	27.5	0.9
55-64 yrs	14.2	14.8	16.7	17.4	20.8	22.0	18.8	18.8	20.0	0.7
65-74 yrs	11.8	14.8	13.0	12.9	13.9	16.0	13.9	15.7	14.2	NL
75-84 yrs	12.7	12.1	13.9	15.0	17.1	17.3	12.7	12.4	15.5	NL
85 or older	*	15.8	*	13.5	13.5	13.0	14.4	*	12.6	*

\*Rates suppressed due to fewer than 20 ED visits.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 18c. Number of ED visit rates resulting from pedestrian injuries by type and year, Ohio, 2002-2010**

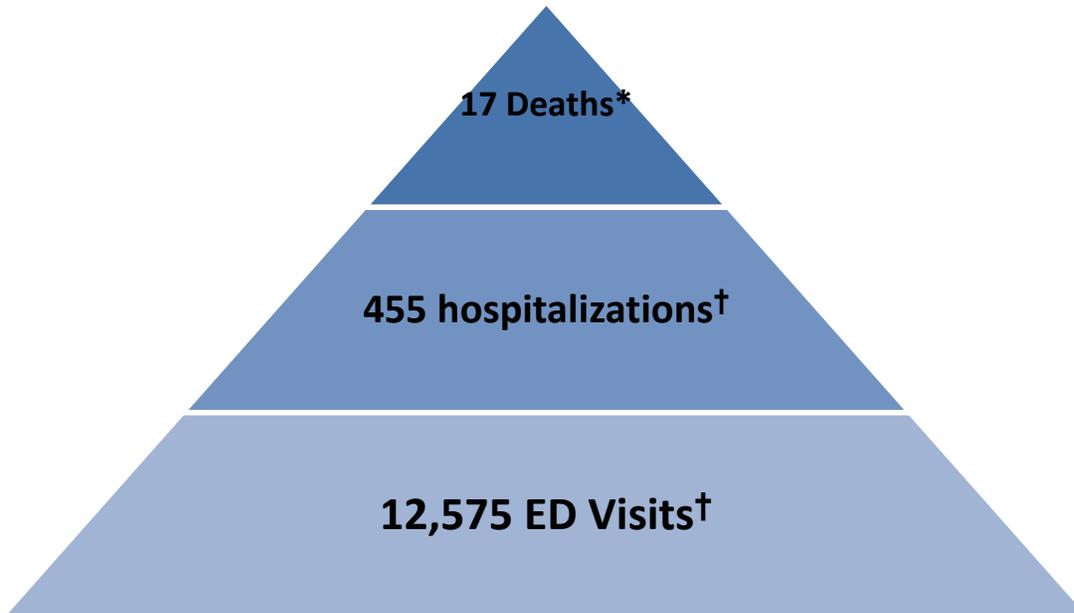
	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Railway	5	9	2	13	15	7	7	5	<5	*	*
Motor vehicle traffic crashes	2,593	2,692	2,727	2,951	3,408	3,388	3,335	3,277	3,198	81%	97
Motor vehicle nontraffic crashes	389	406	452	471	486	456	424	430	464	12%	5 (NL)
Other road vehicle crashes	267	225	194	223	235	271	193	277	287	7%	5 (NL)

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

\*Suppressed due to less than 20 ED visits

## SECTION 3.4: PEDAL CYCLE INJURIES



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

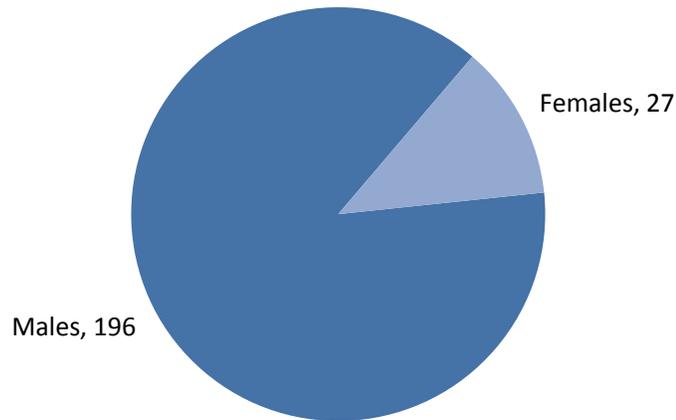
#### Patterns:

- Males were 8 times more likely than females to die from pedal cycle related injury.
- Approximately one pedal cycle related hospitalization occurs each day in Ohio.
- 39 visits are made to an emergency department every day in Ohio for a pedal cycle related injury.
- Male children ages 5-14 are most likely to experience a non-fatal pedal cycle injury.
- Most non-fatal pedal cycle injuries resulted from collisions with other road vehicles.
- Only 50% of children under 18 years of age frequently wear a helmet when riding a pedal cycle.

#### Trends:

- 223 pedal cycle related deaths have occurred in Ohio since 2000.
- Hospitalizations increased 33 percent in 2002-2008 then decreased 26 percent in 2008-2010.
- ED visits increased 9 percent in 2002-2010.
- Males were likely to experience a non-fatal pedal cycle injury throughout study period.
- Adults ages 45-54 were most likely to experience a hospitalization and children ages 5-14 were more likely to experience an ED visit.
- Most non-fatal pedal cycle injuries resulted from collisions with other road vehicles throughout the study period.

**Figure 6.1. Number of pedal cycle deaths by sex, Ohio, 2000-2010**



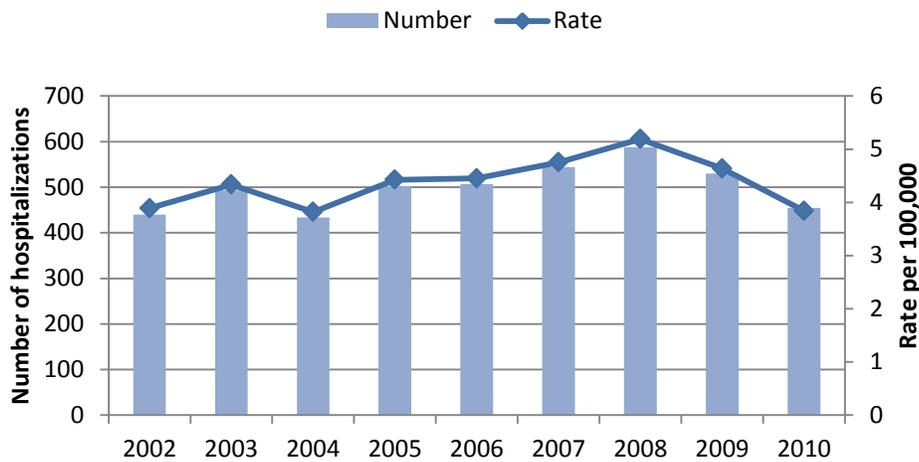
Source: Ohio Department of Health, Vital Statistics

**DEATHS:**

Since 2000, 223 deaths have resulted from pedal cycle injuries. The annual death rate for the period was 0.2 per 100,000. Males were 8 times more likely to die from a pedal cycle related injury than females. Little variation was found across age groups among ages 5-64. Pedal cycle deaths were very uncommon among children younger than 5 or adults ages 65 or older. Death rates were similar among whites and blacks while pedal cycle related deaths were rare among other race and ethnic groups. See Table 6.1 for a pedal cycle death risk profile. Nearly all deaths (92 percent) involved a motor vehicle traffic crash. See Tables 19a-c located at the end of this section for more detailed information on pedal cycle related deaths in Ohio.

Table 6.1 Pedal Cycle Death Risk Profile	
	At Risk Groups
Sex	Males
Age	Similar across age groups
Race and ethnicity	Similar among whites and blacks

**Figure 6.2. Number and age adjusted rate for pedal cycle injury hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

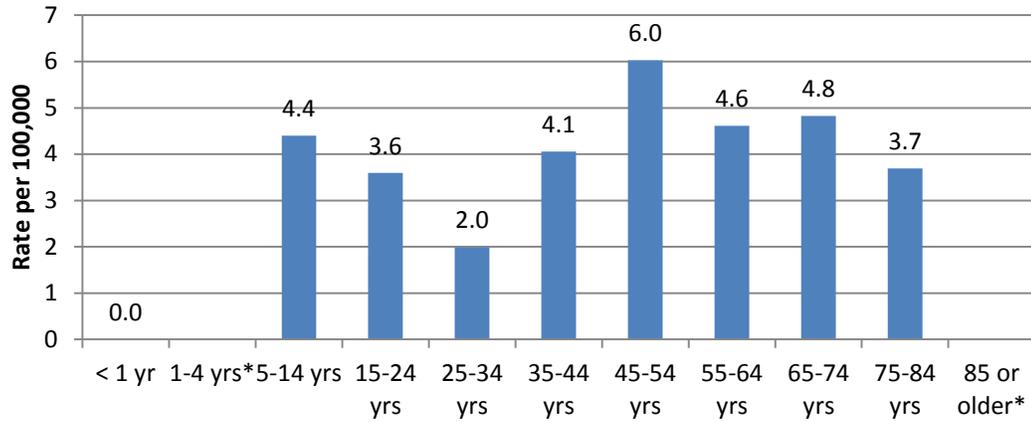
Approximately 450 hospitalizations resulted from pedal cycle injuries in 2010. The hospitalization rate was 3.8 per 100,000 (Figure 6.2). Males were 4 times more likely than females to be hospitalized due to pedal cycle injury. Hospitalization rates fluctuated throughout the lifespan with the highest rates found among children ages 5-14 and adults ages 45-74 (Figure 6.3). See Table 6.2 for a pedal cycle hospitalization risk profile. Most hospitalizations resulted from collisions with other road vehicles (76 percent) and motor vehicle traffic crashes (24 percent) (Figure 6.4).

Table 6.2 Pedal Cycle Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend Since 2002
Overall		No change
Sex	Males	Similar for males and females
Age	45-54	45-54 (largest increase)

**TRENDS:**

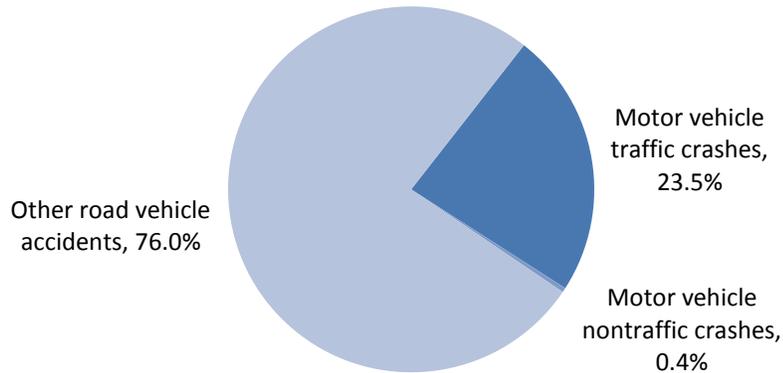
The hospitalization rate for pedal cycle injuries did not change between 2002 and 2010 (Figure 6.2). Rates among males were consistently higher than females during the study period. In 2002-2009, the highest rates of hospitalization were found among children ages 5-14 years. A large decrease in rates among children ages 5-14 occurred from 2009 to 2010. In contrast, a steady rise in hospitalization rates was found among adults ages 45-74 in 2002-2010. Continued monitoring and evaluation is needed to understand the reasons for the decrease in rates by age group. Most hospitalizations resulted from collisions with other road vehicles and motor vehicle traffic crashes throughout the study period. See Tables 20a-c located at the end of this section for more information on hospitalizations resulting from pedal cycle injuries.

Figure 6.3. Hospitalization rates resulting from pedal cycle injuries, by age, Ohio, 2010



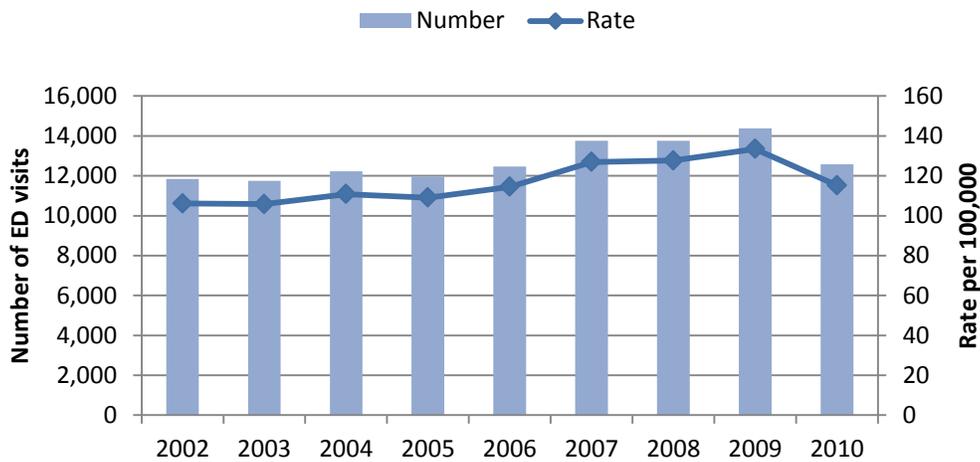
Source: Ohio Hospital Association  
\*Rates suppress due to small cell sizes

Figure 6.4. Distribution of hospitalizations resulting from pedal cycle injuries by cause, Ohio, 2010



Source: Ohio Hospital Association

**Figure 6.5. Number and age adjusted rate for pedal cycle injury ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

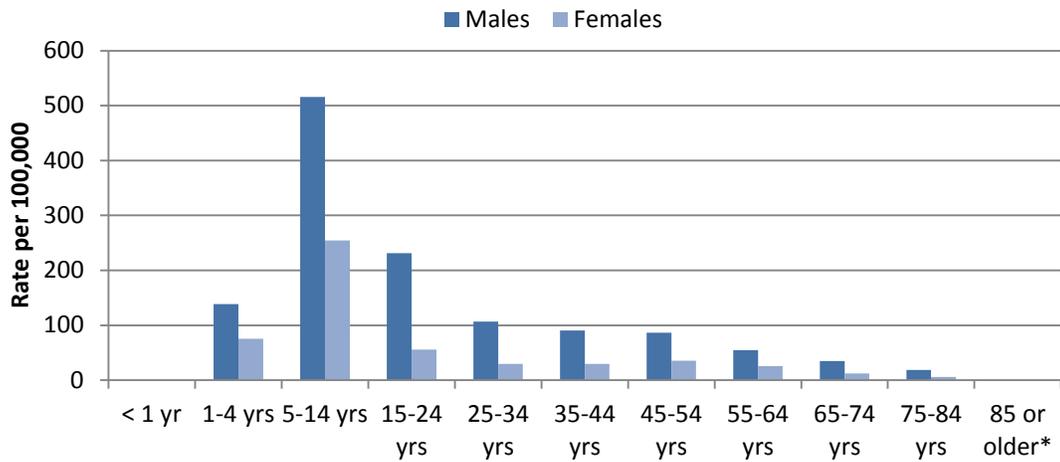
In 2010, approximately 12,000 ED visits resulted from pedal cycle injuries. The ED visit rate was 115 per 100,000 (Figure 6.5). Males were more likely than females to experience an ED visit throughout the lifespan (Figure 6.6). The highest rates were found among children ages 5-14. See Table 6.3 for a pedal cycle injury ED visit risk profile. Nearly all ED visits were associated with a collision with any other road vehicle (91 percent) or motor vehicle traffic (9 percent) (Figure 6.7).

	2010 At Risk Groups	Annual trend since 2002
<b>Overall</b>		+8%
<b>Sex</b>	Males	Males (largest increase)
<b>Age</b>	5-14	15-24 (largest increase)

**TRENDS:**

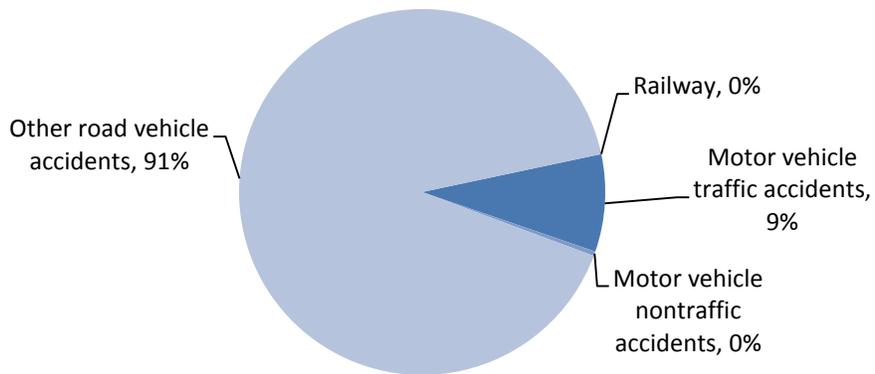
ED visit rates resulting from pedal cycle injuries increased from 106 per 100,000 in 2002 to 115 per 100,000 in 2010 (Figure 6.5). The average annual increase was 2.8 per 100,000 per year. The average annual increase was greater among males (4.0 per 100,000 per year) than females (1.7 per 100,000 per year). The highest rates of ED visits were found among children ages 5-14 throughout the study period. The largest annual increases were found among youth and young adults ages 15-24 (6 per 100,000 per year) and adults ages 45-54 (4.4 per 100,000 per year). Almost all ED visits were associated with a collision with any other road vehicle throughout the study period. ED visits involving motor vehicle traffic collisions increased by 38 visits per year while trends in other road crashes and non-traffic crashes did not follow a linear pattern. See Table 21a-c located at the end of this section for more information on ED visits associated with pedal cycle injuries.

**Figure 6.6. ED visit rates resulting from pedal cycle injuries by age and sex, Ohio, 2010**



Source: Ohio Hospital Association  
 \*Suppressed due to small cell sizes

**Figure 6.7. Distribution of ED visits resulting from pedal cycle injuries by cause, Ohio, 2010**



Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 19a. Number of deaths resulting from unintentional pedal cycle injuries, Ohio, 2000-2010**

	<b>2000-2010</b>
Overall	223
<b>Sex</b>	
Males	196
Females	27
<b>Age</b>	
< 1 yr	0
1-4 yrs	3
5-14 yrs	35
15-24 yrs	24
25-34 yrs	24
35-44 yrs	32
45-54 yrs	46
55-64 yrs	31
65-74 yrs	13
75-84 yrs	12
85 or older	<5
<b>Race and ethnicity†</b>	
White‡	184
Black‡	33
Hispanic	5
Other‡	<5

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 19b. Death rates per 100,000 resulting from unintentional pedal cycle injuries, Ohio, 2000-2010**

	2000-2010
Overall†	0.17
<b>Sex†</b>	
Males	0.31
Females	0.04
<b>Age</b>	
< 1 yr	0.00
1-4 yrs	*
5-14 yrs	0.20
15-24 yrs	0.14
25-34 yrs	0.15
35-44 yrs	0.18
45-54 yrs	0.25
55-64 yrs	0.23
65-74 yrs	*
75-84 yrs	*
85 or older	*
<b>Race and ethnicity†</b>	
White‡	0.17
Black‡	0.21
Hispanic	*
Other‡	*

†Rates are age adjusted to 2000 U.S. standard population

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 19c. Number of deaths resulting from unintentional pedal cycle injuries, by mechanism and year, Ohio, 2000-2010**

	<b>2000-2010</b>	<b>Percent</b>
Traffic	205	92%
Nontraffic	18	8%

Source: Ohio Department of Health, Office of Vital Statistics

**Table 20a. Number of hospitalizations resulting from pedal cycle injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	440	493	434	503	507	544	588	530	455
<b>Sex</b>									
Males	332	389	333	402	395	419	448	397	362
Females	108	104	101	101	112	125	140	133	93
<b>Age</b>									
< 1 yr	0	0	0	<5	0	<5	<5	0	0
1-4 yrs	11	7	8	7	12	12	6	7	3
5-14 yrs	177	182	145	160	179	175	204	159	67
15-24 yrs	70	80	54	80	76	83	79	81	57
25-34 yrs	35	33	35	33	27	36	40	34	28
35-44 yrs	47	50	53	61	41	37	47	47	60
45-54 yrs	43	66	62	73	87	103	98	86	105
55-64 yrs	33	35	37	53	48	57	59	57	67
65-74 yrs	15	22	20	22	19	24	36	38	41
75-84 yrs	7	15	20	10	13	14	17	20	20
85 or older	<5	<5	0	<5	5	<5	<5	<5	7

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 20b. Hospitalization rates per 100,000 resulting from pedal cycle injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	3.9	4.3	3.8	4.4	4.5	4.8	5.2	4.6	3.8	0.1 (NL)
<b>Sex†</b>										
Males	5.9	6.9	5.9	7.2	7.0	7.4	8.0	7.1	6.3	0.1 (NL)
Females	1.9	1.8	1.8	1.8	1.9	2.2	2.4	2.2	1.5	<0.1 (NL)
<b>Age</b>										
< 1 yr	0.0	0.0	0.0	*	0.0	*	*	0.0	0.0	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*
5-14 yrs	11.0	11.4	9.2	10.3	11.7	11.6	13.6	10.6	4.4	-0.3 (NL)
15-24 yrs	4.4	5.0	3.4	5.0	4.8	5.3	5.0	5.2	3.6	<0.1 (NL)
25-34 yrs	2.4	2.3	2.4	2.3	1.9	2.5	2.7	2.3	2.0	<-0.1 (NL)
35-44 yrs	2.7	2.9	3.2	3.7	2.5	2.3	3.0	3.1	4.1	<0.1 (NL)
45-54 yrs	2.6	3.9	3.7	4.3	5.0	5.9	5.6	4.9	6.0	0.4
55-64 yrs	3.0	3.1	3.2	4.4	3.8	4.4	4.4	4.1	4.6	0.2
65-74 yrs	1.9	2.9	2.6	2.9	2.5	3.1	4.5	4.5	4.8	0.3
75-84 yrs	*	*	3.6	*	*	*	*	3.7	3.7	*
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to cell sizes less than 20.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 20c. Number of hospitalizations resulting from pedal cycle injuries by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Railway	0	0	0	<5	<5	0	<5	0	0	0%	*
Motor vehicle traffic crashes	102	116	104	107	136	120	156	107	107	24%	2 (NL)
Motor vehicle nontraffic crashes	7	<5	<5	<5	<5	<5	6	<5	<5	*	*
Other road vehicle crashes	331	373	326	391	368	422	425	420	346	76%	7 (NL)

\*Suppressed due to less than 20 hospitalizations

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 21a. Number of ED visits resulting from pedal cycle injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	11,848	11,750	12,229	11,948	12,467	13,751	13,765	14,376	12,575
<b>Sex</b>									
Males	8,558	8,391	8,747	8,500	8,828	9,876	9,852	10,208	9,016
Females	3,290	3,359	3,482	3,448	3,639	3,875	3,913	4,168	3,559
<b>Age</b>									
< 1 yr	0	<5	0	<5	<5	0	<5	<5	0
1-4 yrs	681	672	706	664	658	677	719	784	627
5-14 yrs	6,996	7,011	7,083	6,576	6,596	7,078	6,891	7,335	5,911
15-24 yrs	1,844	1,821	1,981	2,066	2,198	2,483	2,480	2,504	2,296
25-34 yrs	686	660	683	740	792	948	980	1,058	958
35-44 yrs	805	699	789	776	875	953	969	898	887
45-54 yrs	488	531	596	686	796	977	1,009	1,028	1,055
55-64 yrs	211	218	237	274	356	433	482	486	575
65-74 yrs	92	92	99	117	131	139	164	192	193
75-84 yrs	38	35	48	39	59	55	58	71	60
85 or older	7	8	7	9	5	8	11	16	13

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 21b. ED visit rates per 100,000 resulting from pedal cycle injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall	106	106	111	109	114	127	128	133	115	2.8
<b>Sex</b>										
Males	151	149	157	153	160	180	181	187	164	4.0
Females	60	62	64	64	68	72	74	79	66	1.7
<b>Age</b>										
< 1 yr	0	*	0	*	*	0	*	*	0	*
1-4 yrs	113	112	119	112	112	115	122	132	108	0.8 (NL)
5-14 yrs	433	439	449	423	430	467	460	491	388	0.8 (NL)
15-24 yrs	117	114	124	130	139	158	158	160	145	5.8
25-34 yrs	46	45	47	51	54	65	67	72	68	3.7
35-44 yrs	46	41	47	47	54	60	62	59	60	2.5
45-54 yrs	30	32	35	40	46	56	58	59	61	4.4
55-64 yrs	19	19	20	23	28	33	36	35	40	2.8
65-74 yrs	12	12	13	15	17	18	20	23	23	1.6
75-84 yrs	7	6	9	7	11	10	11	13	11	0.7
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 ED visits

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 21c. Number of ED visit rates resulting from pedal cycle injuries by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Railway	<5	<5	<5	<5	<5	<5	<5	<5	0	*	*
Motor vehicle traffic crashes	860	854	830	907	1,039	1,094	1,107	1,069	1,078	8.6%	38
Motor vehicle nontraffic crashes	50	63	51	51	31	34	50	50	53	0.4%	-1 (NL)
Other road vehicle crashes	10,936	10,832	11,346	10,988	11,397	12,620	12,606	13,256	11,443	91.0%	224 (NL)

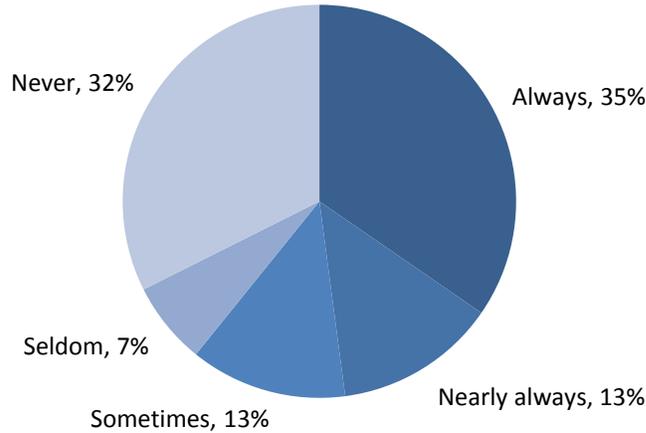
\*Suppressed due to less than 20 ED visits

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

## SECTION 3.4A: YOUTH BICYCLE HELMET USE

**Figure 6.8. Percentage of children less than 18 years of age who wear a helmet when riding a bicycle, by frequency of helmet use, Ohio, 2010**



Source: Ohio Behavioral Risk Factor Surveillance System

### BICYCLE HELMET USE:

Research has shown wearing a bicycle helmet reduces an individual’s risk for traumatic head and brain injuries<sup>1</sup>. In 2010, approximately 50 percent of Ohio adults reported the oldest child in their household infrequently (e.g. “never”, “rarely” or “sometimes”) wears a helmet when riding a bicycle. The frequency of bicycle helmet use varied by levels of household income and county economic development. Adults from households with income levels below poverty and slightly above poverty (less than 200 percent) were more likely to report their children infrequently wears a helmet compared to households with income 200 percent or more above poverty. Adults from rural and Appalachian counties were more likely report their children infrequently use bicycle helmets compared to adults from metropolitan counties. See Tables 22a-b located at the end of this section for more detailed information on bicycle helmet use among children less than 18 years of age in Ohio. See Appendix 10 and 11 for more detailed information on household poverty and county economic development definitions.

Table 6.4 Bicycle Helmet Use Risk Profile	
	2010 At Risk Groups
Overall	52%
Household Poverty	Below poverty and slightly above poverty
County Development*	Rural and Appalachian

<sup>1</sup> Ivers R. Systematic reviews of bicycle helmet research. *Injury Prev.* 2007 June; 13(3): 190.

**Table 22a. Bicycle helmet use among oldest child in household who ride a bicycle, by frequency of use, Ohio, 2010**

	2010 Ohio BRFSS		
	N	Percent	95% CI
Always	398	34.6	(31.1-38.1)
Nearly always	152	13.3	(10.8-15.9)
Sometimes	148	12.9	(10.4-15.4)
Seldom	85	6.8	(5.0-8.5)
Never	404	32.4	(29.0-35.8)

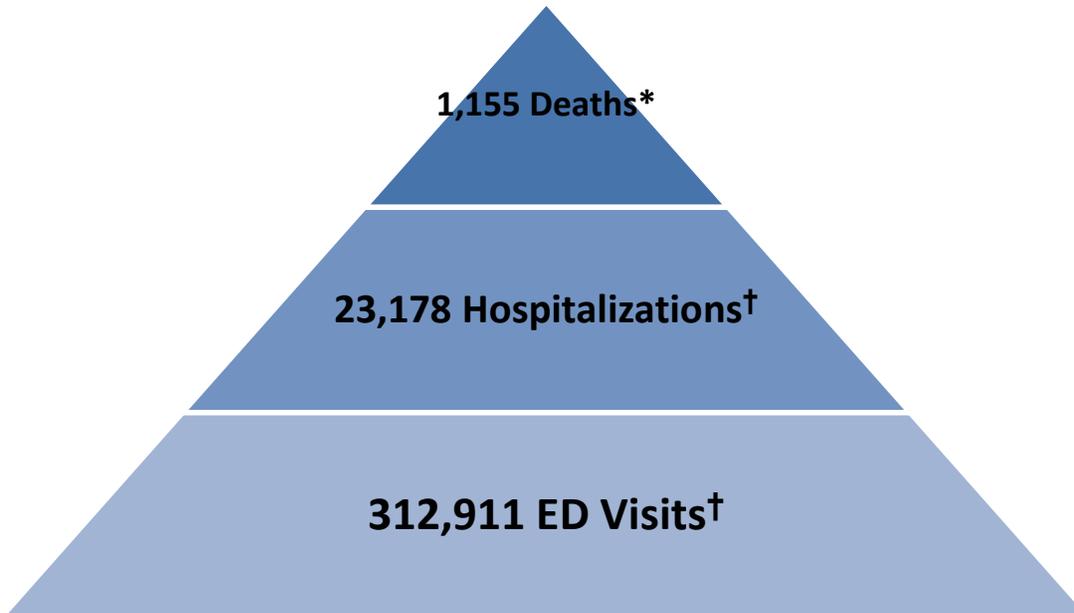
Source: Ohio Behavioral Risk Factor Surveillance System

**Table 22b. Prevalence of respondents who reported the oldest child sometimes, rarely, or never wear a helmet when riding a bicycle, Ohio, 2010**

	Percent	95% CI
Overall	52.0	(48.4-55.7)
Below poverty	66.2	(55.7-76.6)
Above poverty, less than 200%	62.7	(55.3-70.2)
Above poverty, 200% or more	45.0	(40.3-49.6)
Missing household/income	61.7	(47.7-75.9)
Metropolitan	46.2	(41.3-51.1)
Suburban	50.0	(41.4-58.6)
Rural	64.9	(55.5-74.3)
Appalachian	60.8	(50.4-71.2)

Source: Ohio Behavioral Risk Factor Surveillance System

## SECTION 3.5: FALLS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

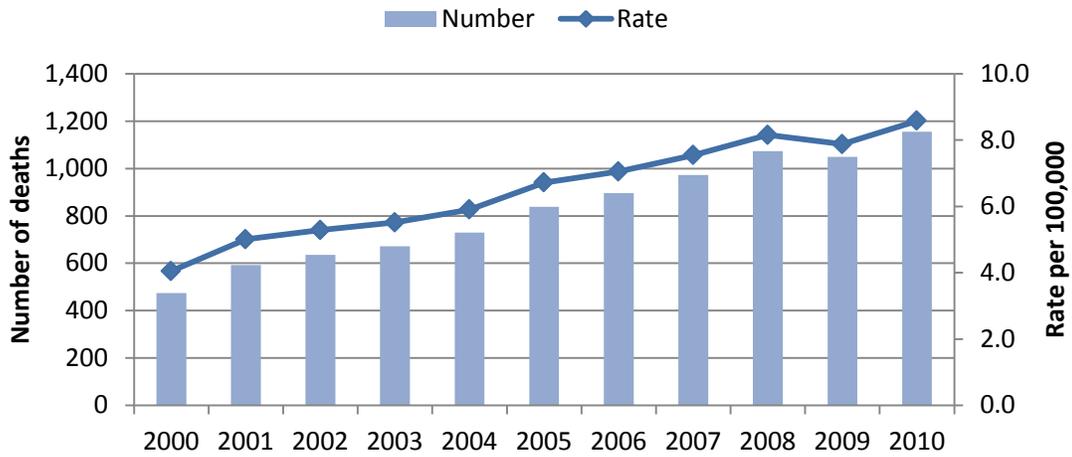
#### Patterns:

- Falls are one of the leading causes of fatal and non-fatal unintentional injuries in Ohio.
- Most fatal and non-fatal injuries caused occur among adults age 65 or older.
- Most non-fatal injuries result from slipping or tripping on an object on the same level, on a different level, and steps or stairs. A substantial percentage of non-fatal fall related injuries do not specify the cause of the fall.

#### Trends:

- Death rates have increased 115 percent since 2000 and ED visit rates increased 54 percent since 2002.
- Hospitalization rates have not changed since 2003.
- Most non-fatal injuries resulted from slipping or tripping on an object on the same level, on a different level, and steps or stairs throughout the study period.

**Figure 7.1. Number and age adjusted rate of unintentional fall deaths by year, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

**DEATHS:**

Nearly 1,200 deaths resulted from unintentional falls in 2010. The fall death rate was 8.6 per 100,000 (Figure 7.1). Males were more likely to die from a fall than females (10.5 versus 7.2 per 100,000). Fall fatality rates increased with age with the highest rates found among adults ages 85 or older (Figure 7.2). Whites were more likely to experience a fall related death (8.8 per 100,000) than blacks (6.3 per 100,000). See Table 7.1 for an unintentional falls death risk profile. Approximately one-half of fall related deaths had an unspecified cause. Other leading mechanisms included other fall from the same level (27 percent) and stairs or steps (10 percent) (Figure 7.3).

Table 7.1 Unintentional Falls Death Risk Profile		
	2010 At Risk Groups	Annual trend since 2000
Overall		+115%
Sex	Males	Males (largest increase)
Age	85 or older	85 or older (largest increase)
Race and ethnicity	Whites	Whites (largest increase)

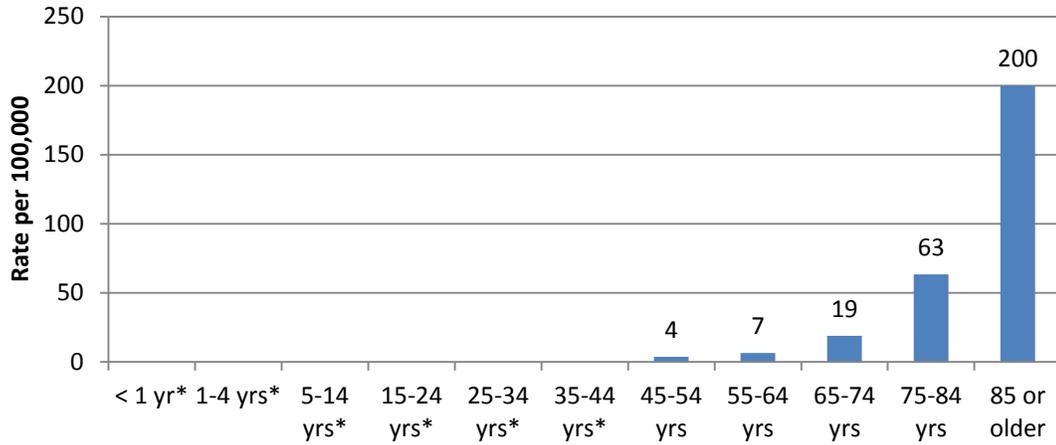
**TRENDS:**

Fall related fatality rates increased 115 percent from 4.0 per 100,000 in 2000 to 8.6 per 100,000 in 2010. The average annual increase in rates was 0.4 per 100,000 per year. The increase in rates was greater among males (0.5 per 100,000 per year) than females (0.4 per 100,000 per year). The highest rates of fall fatalities were found among adults ages 85 or older throughout the period. The rates increased by an average of 11 per 100,000 per year. Rates were consistently higher among whites than blacks throughout the period. Rates among whites increased by an average of 0.5 per 100,000 per year while rates among blacks did not follow a linear trend. The largest increases in the number of fall fatalities were found among falls with an unspecified

Ohio Violence and Injury Prevention Program, Ohio Department of Health

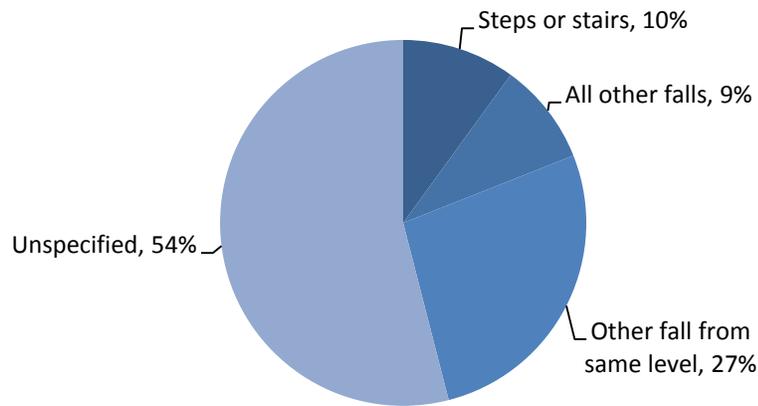
cause (39 per year) and other falls on the same level (23 per year). See Tables 22a-c located at the end of the section for more detailed information on fall related fatalities.

**Figure 7.2. Death rates resulting from falls, by age, Ohio, 2010**



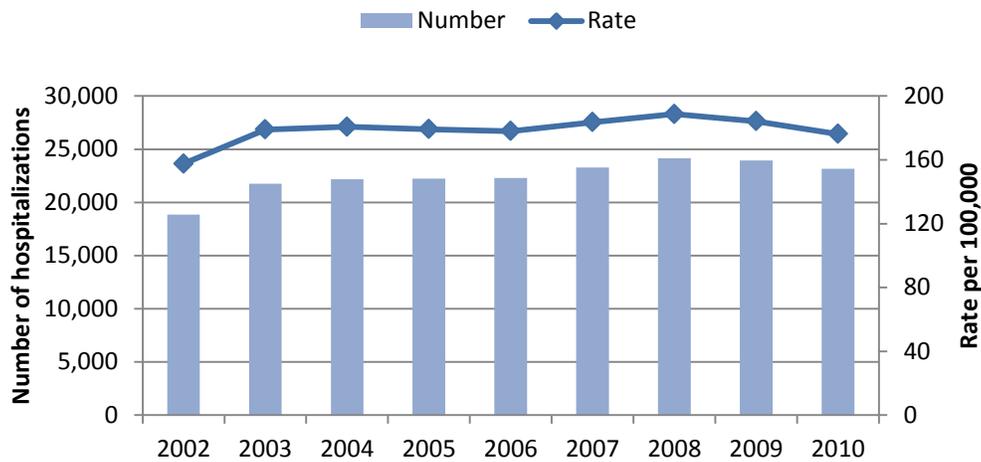
Source: Ohio Department of Health, Vital Statistics  
\*Rates suppressed due to less than 20 deaths

**Figure 7.3. Distribution of deaths resulting from unintentional falls by cause, Ohio, 2010**



Source: Ohio Department of Health, Vital Statistics

**Figure 7.4. Number and age adjusted rate for unintentional fall hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

In 2010, approximately 23,000 hospitalizations resulted from unintentional falls. The hospitalization rate was 176 per 100,000 (Figure 7.4). Overall hospitalization rates decreased with age from birth through age 14 and then increased with age among individuals 15 years or older. The highest rates were found among adults ages 75 or older (Figure 7.5). Hospitalization rates varied by sex with higher rates found among males from birth through age 54 while rates were higher among females among adults 55 or older. See Table 7.2 for an unintentional fall hospitalization risk profile.

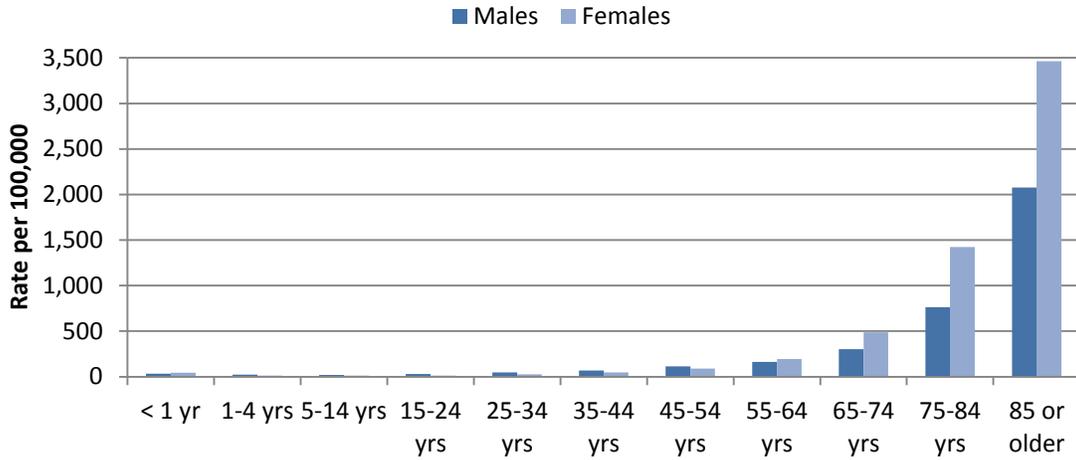
The most common causes of fall related hospitalizations were tripping or slipping on the same level (37 percent), falling from an object at a different level (11 percent), and falling from or on stairs or steps (10 percent). Approximately 37 percent of falls did not have a specified cause (Figure 7.6).

**TRENDS:**

Hospitalizations resulting from unintentional falls largely remained the same in 2003-2010 (Figure 7.4). The pattern in hospitalizations did not follow a consistent trend for males or females. Hospitalization rates increased by an average of 44 per 100,000 per year among adults ages 85 or older while rates did not change or follow a consistent trend for all other age groups. The number of hospitalizations resulting from slipping, tripping, or stumbling on the same level increased by an average of 263 per year and falls resulting from other or unspecified mechanism increased by 159 per year. See Tables 24a-c located at the end of this section for more detailed information on the number and rate of unintentional fall related hospitalizations.

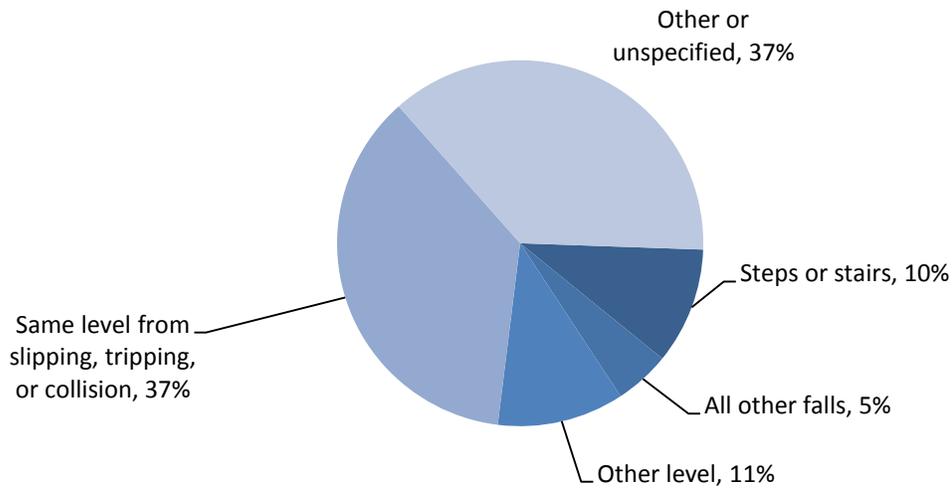
Table 7.2 Unintentional Falls Hospitalization Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		No change
Sex	Females	Similar for males and females
Age	75 or older	85 or older (largest increase)

**Figure 7.5. Hospitalization rates resulting from falls, by age and sex, Ohio, 2010**



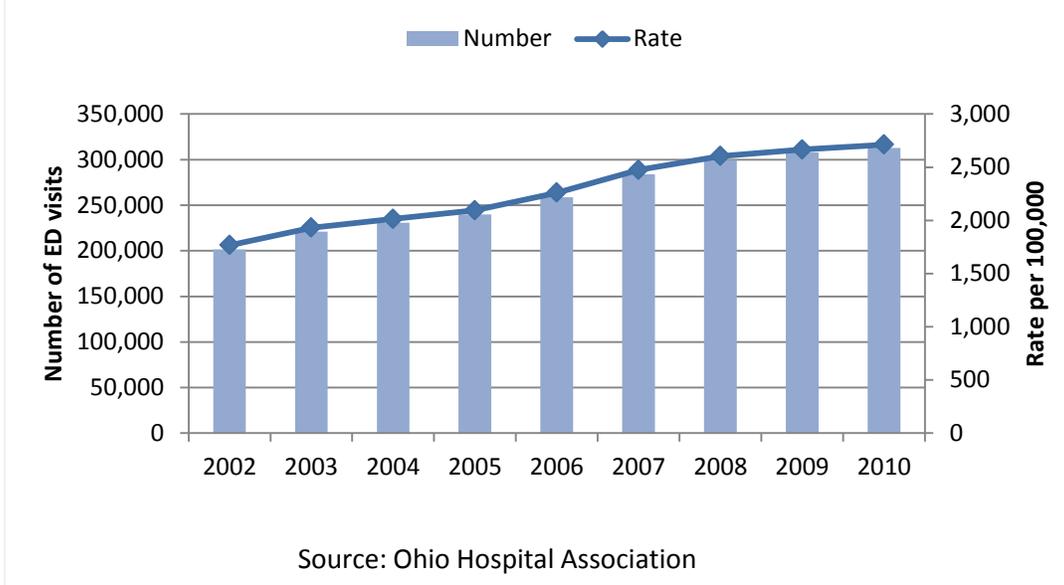
Source: Ohio Hospital Association

**Figure 7.6. Distribution of hospitalizations resulting from unintentional falls by cause, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 7.7. Number and age adjusted rate for unintentional fall ED visits by year, Ohio, 2002-2010**



**EMERGENCY DEPARTMENT VISITS:**

In 2010, 312,911 ED visits were associated with unintentional falls. The ED visit rate was 2,711 per 100,000 (Figure 7.7). The rate of ED visits was higher among males from birth through age 14 and higher among females among individuals aged 15 or older. The highest rates of fall related ED visits were found among children ages 1-4 years and adults 75 or older (Figure 7.8). See Table 7.3 for an unintentional falls ED visit risk profile.

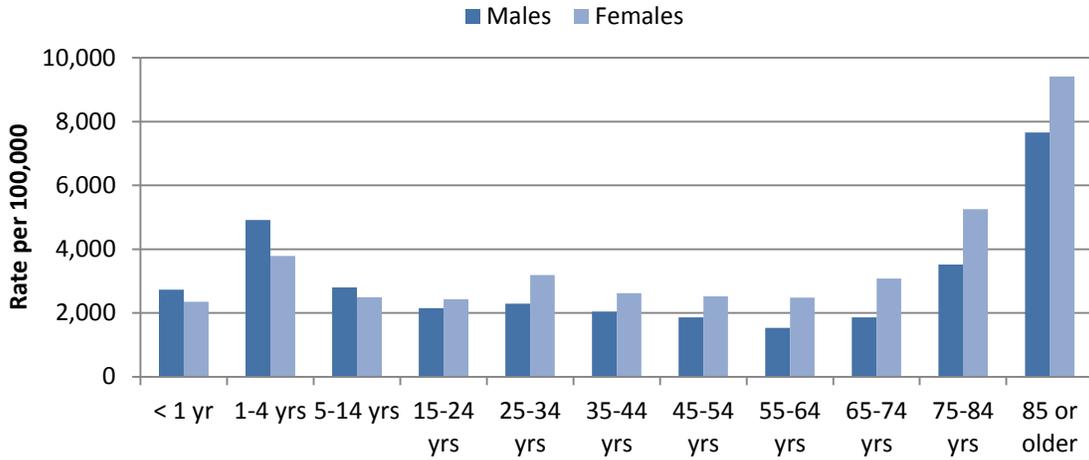
	2010 At Risk Groups	Annual Trend since 2002
<b>Overall</b>		+54%
<b>Sex</b>	Females	Females (largest increase)
<b>Age</b>	75 or older	85 or older (largest increase)

The most common causes of fall related ED visits were from slipping or tripping on the same level (36 percent), steps or stairs (14 percent), and from a different level (13 percent). In addition, 34 percent of falls had an unspecified cause (Figure 7.9).

**TRENDS:**

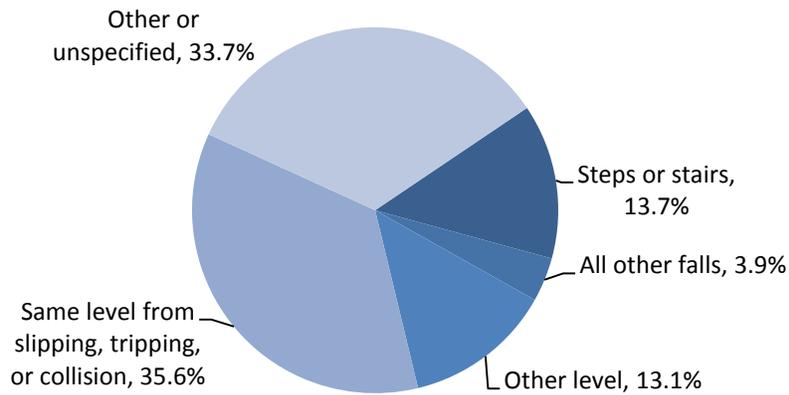
ED visits associated with unintentional falls increased 54 percent from 1,766 per 100,000 in 2002 to 2,771 per 100,000 in 2010 (Figure 7.7). The average annual increase was 126 per 100,000 per year. The increase in falls was higher among females (142 per 100,000 per year) compared to males (109 per 100,000). Rates increased among all age groups with the largest increases found among ages 85 or older (426 per 100,000 per year). The observed increase was largely driven by the substantial increase in falls caused by slipping or tripping on the same level (+5,933 per year), other or unspecified falls (4,795 per year) and stairs or steps (2,142 per year). See Tables 25a-c located at the end of this section for more detailed information on the number and rate of ED visits associated with unintentional falls.

**Figure 7.8. ED visit rates resulting from falls, by age and sex, Ohio, 2010**



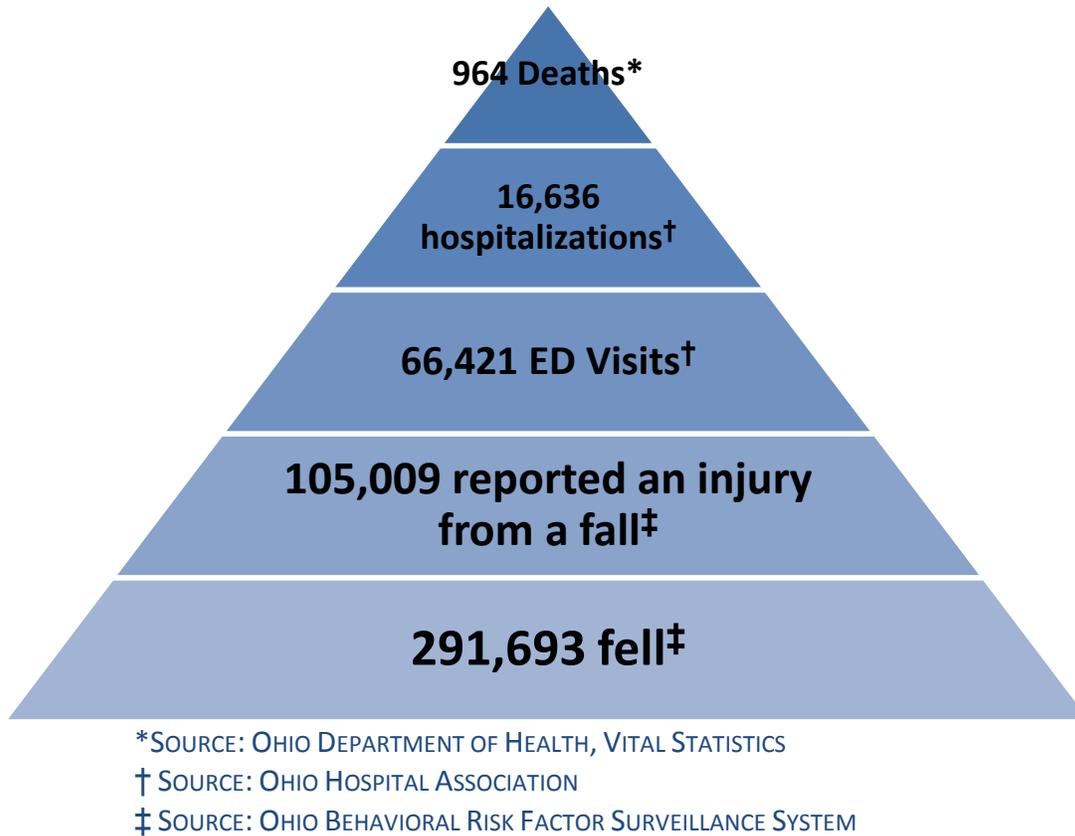
Source: Ohio Hospital Association

**Figure 7.9. Distribution of ED visits resulting from unintentional falls by cause, Ohio, 2010**



Source: Ohio Hospital Association

## SECTION 3.6: FALLS AMONG ADULTS AGES 65 OR OLDER



### CHAPTER HIGHLIGHTS:

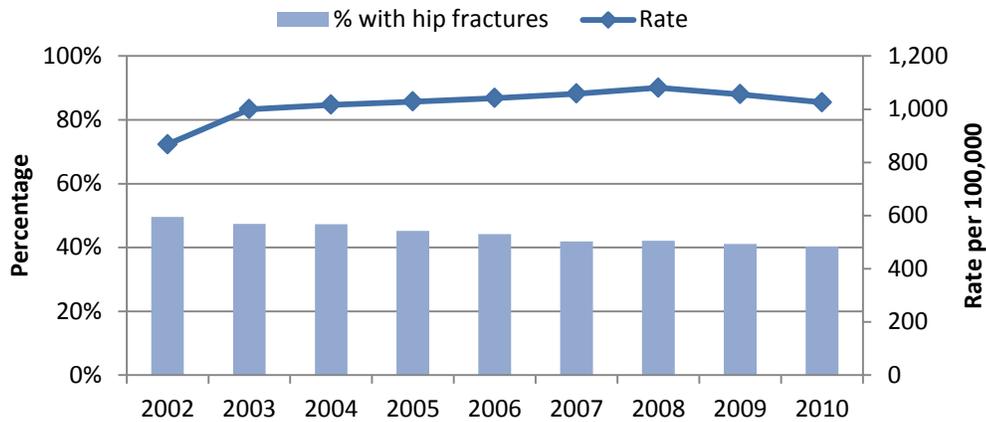
#### Patterns:

- Hip fractures are associated with 40 percent of fall related hospitalizations.
- 1 in 6 adults over the age of 45 reported a fall in the last 3 months.
  - Adults ages 45-54, retirees, and income levels near or below poverty were the most likely to report a fall.
- Among those who fell, 1 in 3 adults were injured by the fall.
  - Retirees and adults with incomes at or below poverty were the most likely to report a fall related injury.

#### Trends:

- The percentage of fall related hospitalizations with a hip fracture decreased since 2003.
- The percentage of adults who reported a fall in the last 3 months has not changed since 2006. However the percentage of adults who reported 4 or more falls has significantly increased.
- The percentage of adults who reported a fall-related injury has not changed since 2006.

**Figure 7.10. Hospitalizations rates resulting from unintentional falls and percentage of falls with a hip fracture among adults 65 or older, by year, Ohio, 2002-2010**



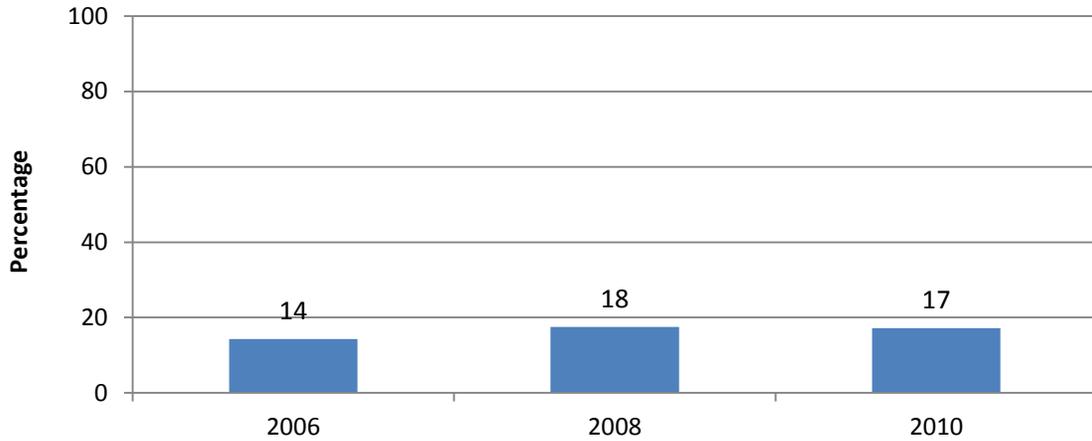
Source: Ohio Hospital Association

**FALLS AND HIP FRACTURES AMONG OLDER ADULTS:**

In 2010, 16,363 fall-related hospitalizations occurred among adults ages 65 or older. The age specific hospitalization rate was 1,026 per 100,000. Of the fall-related hospitalizations, 6,696 or 40 percent caused a hip fracture (Figure 7.10).

Fall related hospitalization rates remained the same since 2003 while the percentage of falls causing a hip fracture slightly decreased from 47 percent in 2003 to 40 percent in 2010 (Figure 7.10). The decrease in the percentage of fall related hip fractures is likely attributable to the decrease in external cause of injury coding rates. See Table 26a located at the end of this section for more details on hip fractures among adults ages 65 or older.

**Figure 7.11. Percentage of adults aged 65 or older who reported a fall in the last 3 months, Ohio, 2006, 2008, and 2010**



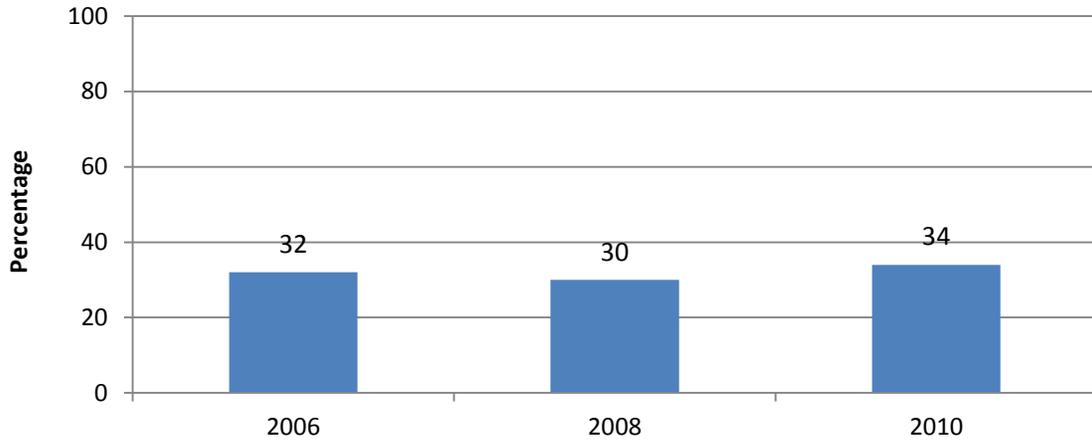
Source: Ohio Behavioral Risk Factor Surveillance System

### **FALL PATTERNS AND TRENDS:**

Falls and health care resources associated with treating falls among older adults is a significant public health issue in Ohio. Nearly 300,000 or 17 percent of adults aged 65 or older reported a fall in the last 3 months in 2010 (Figure 7.11). Among those who reported a fall in the last 3 months, 61 percent fell one time, 31 percent fell 2 or 3 times, and 8 percent reported 4 or more falls.

Since 2006, the percentage of adults aged 65 or older who reported a fall in the last 3 months has not changed (Figure 7.11). See table 26a located at the end of this section for more detailed information on the prevalence of falls among adults ages 65 or older.

**Figure 7.12. Percentage of adults aged 65 or older who reported a fall related injury among those who fell in the last 3 months, Ohio, 2006, 2008, and 2010**



Source: Ohio Behavioral Risk Factor Surveillance System

### **FALL RELATED INJURY PATTERNS AND TRENDS:**

Among adults who reported a fall in the last 3 months, approximately 100,000 or 34% reported an injury caused by a fall in 2010 (Figure 7.12). The percentage of adults who reported a fall related injury did not change significantly since 2006. See Table 26b located at the end of this section for more detailed information about and fall related injuries.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 23a. Number of deaths resulting from unintentional falls, by year, Ohio, 2000-2010**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	474	593	635	672	729	838	896	973	1,073	1,049	1,155
<b>Sex</b>											
Males	244	318	326	328	389	417	457	485	523	572	559
Females	230	275	309	344	340	421	439	488	550	477	596
<b>Age</b>											
< 1 yr	0	0	<5	<5	0	<5	<5	<5	<5	0	0
1-4 yrs	<5	0	0	5	<5	<5	<5	<5	<5	0	<5
5-14 yrs	<5	<5	<5	<5	<5	0	<5	<5	<5	<5	<5
15-24 yrs	5	6	3	9	6	6	6	10	6	7	<5
25-34 yrs	14	13	6	8	11	<5	8	11	5	6	15
35-44 yrs	18	25	21	20	26	30	23	24	20	18	10
45-54 yrs	26	49	50	32	33	52	49	50	69	73	64
55-64 yrs	41	48	37	43	83	59	72	63	87	88	96
65-74 yrs	65	80	82	89	87	104	112	137	112	121	161
75-84 yrs	146	184	202	213	235	278	286	279	334	318	343
85 or older	155	185	231	250	245	301	334	393	436	417	460
<b>Race and ethnicity</b>											
White‡	425	524	602	618	676	773	826	901	1,003	971	1,067
Black‡	41	61	28	43	42	51	62	52	57	63	75
Hispanic	<5	5	<5	8	<5	5	7	10	5	9	5
Other‡	<5	<5	<5	<5	<5	<5	<5	5	6	<5	7

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 23b. Death rates per 100,000 resulting from unintentional falls, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	4.0	5.0	5.3	5.5	5.9	6.7	7.1	7.5	8.2	7.9	8.6	0.44
<b>Sex†</b>												
Males	5.4	6.9	7.2	7.2	8.1	8.7	9.4	9.9	10.5	11.1	10.5	0.53
Females	3.1	3.7	4.0	4.4	4.3	5.3	5.4	6.0	6.6	5.6	7.2	0.37
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*	*	*
5-14 yrs	*	*	*	*	*	*	*	*	*	*	*	*
15-24 yrs	*	*	*	*	*	*	*	*	*	*	*	*
25-34 yrs	*	*	*	*	*	*	*	*	*	*	*	*
35-44 yrs	*	1.4	1.2	1.2	1.5	1.8	1.4	1.5	1.3	1.2	*	*
45-54 yrs	1.7	3.0	3.0	1.9	1.9	3.0	2.8	2.9	3.9	4.2	3.7	0.18
55-64 yrs	4.0	4.7	3.4	3.8	7.1	4.9	5.7	4.8	6.5	6.4	6.6	0.27
65-74 yrs	8.3	10.3	10.6	11.6	11.3	13.5	14.5	17.4	13.7	14.5	18.9	0.86
75-84 yrs	26.9	33.5	36.4	38.1	42.0	49.7	51.3	50.4	61.0	58.8	63.5	3.56
85 or older	87.2	102.1	125.1	131.5	126.4	151.2	161.5	183.4	197.9	183.8	199.9	11.34
<b>Race and ethnicity†</b>												
White‡	4.0	4.9	5.5	5.6	6.1	6.9	7.2	7.8	8.5	8.1	8.8	0.47
Black‡	4.1	5.8	6.0	4.1	3.7	4.7	5.6	4.9	5.2	5.4	6.3	0.10 (NL)
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 23c. Number of deaths resulting from unintentional falls, by mechanism and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Same level	26	19	17	22	28	18	10	17	22	25	18	2%	*
Carried by other persons	<5	<5	<5	0	0	<5	0	<5	<5	<5	0	0%	*
Wheelchair	<5	<5	5	9	19	13	12	13	24	14	17	1%	*
Bed	15	9	15	25	13	21	13	25	17	22	20	2%	*
Chair	6	5	6	8	<5	9	9	<5	<5	8	9	1%	*
Other furniture	<5	0	<5	<5	<5	<5	8	<5	5	<5	<5	*	*
Playground	0	0	0	0	0	0	0	0	0	0	0	0%	*
Stairs or steps	67	102	86	92	99	103	110	100	102	102	119	10%	3.1
Ladder or scaffolding	10	13	17	10	18	16	11	15	12	14	17	1%	*
From/out of building	16	27	14	10	24	19	27	20	22	17	14	1%	*
Tree	5	<5	<5	5	6	<5	5	5	<5	<5	<5	*	*
Cliff	<5	<5	<5	8	<5	<5	0	<5	0	<5	<5	*	*
Jumping or diving in water (not drowning)	<5	<5	0	5	8	<5	<5	<5	0	0	<5	*	*
Other fall from different level	21	33	18	16	19	22	20	23	18	28	8	1%	*
Other fall from same level	84	84	92	108	157	200	182	208	249	263	307	27%	23.0
Unspecified	215	292	354	353	330	410	487	533	592	547	619	54%	38.8

\*Rates suppressed due to fewer than 20 deaths

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 24a. Number of hospitalization resulting from unintentional falls, by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	18,868	21,761	22,168	22,234	22,310	23,271	24,149	23,945	23,178
<b>Sex</b>									
Males	6,524	7,506	7,757	7,415	7,362	7,809	8,240	8,108	7,847
Females	12,344	14,255	14,411	14,819	14,948	15,462	15,909	15,837	15,331
<b>Age</b>									
< 1 yr	47	52	56	75	95	75	80	71	55
1-4 yrs	168	145	167	200	266	249	264	254	107
5-14 yrs	403	399	383	445	532	581	554	440	241
15-24 yrs	436	528	483	458	475	488	446	465	364
25-34 yrs	569	638	621	563	523	535	608	517	540
35-44 yrs	1,118	1,128	1,152	971	916	941	910	871	860
45-54 yrs	1,454	1,700	1,716	1,691	1,503	1,746	1,862	1,855	1,778
55-64 yrs	1,539	1,964	2,100	2,125	2,020	2,272	2,454	2,519	2,597
65-74 yrs	2,609	3,028	3,085	3,073	2,987	3,190	3,355	3,330	3,421
75-84 yrs	5,567	6,555	6,570	6,580	6,631	6,576	6,775	6,455	6,242
85 or older	4,958	5,624	5,835	6,053	6,362	6,618	6,841	7,168	6,973
65 or older	13,134	15,207	15,490	15,706	15,980	16,384	16,971	16,953	16,636

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 24b. Hospitalization rates per 100,000 resulting from unintentional falls, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	157.6	179.0	180.8	179.2	178.0	183.6	188.7	184.2	176.3	2 (NL)
<b>Sex†</b>										
Males	132.3	149.4	152.7	144.6	142.5	148.5	154.9	151.7	142.8	1 (NL)
Females	169.2	193.3	193.6	197.6	196.7	202.0	206.6	202.1	195.4	3 (NL)
<b>Age</b>										
< 1 yr	31.9	35.3	37.5	51.2	64.1	49.5	52.4	48.1	39.6	2 (NL)
1-4 yrs	27.9	24.2	28.0	33.7	45.3	42.4	44.7	42.9	18.4	1 (NL)
5-14 yrs	24.9	25.0	24.3	28.6	34.7	38.4	37.0	29.4	15.8	<1 (NL)
15-24 yrs	27.6	33.1	30.3	28.8	30.0	31.0	28.4	29.7	22.9	-0.5 (NL)
25-34 yrs	38.6	43.5	42.5	38.6	35.9	36.6	41.5	35.0	38.3	-0.5 (NL)
35-44 yrs	64.0	66.1	68.7	58.9	56.5	59.1	58.5	57.3	58.1	-1 (NL)
45-54 yrs	88.3	101.7	101.2	98.5	86.5	99.9	106.3	105.7	102.1	1 (NL)
55-64 yrs	142.1	174.5	179.7	175.1	160.7	174.9	184.1	181.7	178.8	3 (NL)
65-74 yrs	338.2	393.9	402.0	401.2	388.3	407.8	415.6	398.4	402.4	5 (NL)
75-84 yrs	1,006.4	1,179.1	1,182.1	1,187.2	1,206.7	1,211.3	1,266.4	1,190.7	1,153.0	14 (NL)
85 or older	2,624.7	2,870.0	2,910.9	2,924.5	2,961.5	2,974.1	2,991.9	3,151.9	3,026.1	44

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 24c. Number of hospitalization resulting from unintentional falls, by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Steps or stairs	2,048	2,171	2,257	2,283	2,305	2,358	2,329	2,424	2,381	10.3%	0.4
Ladders or scaffolding	673	785	793	697	723	743	754	666	759	3.3%	-1 (NL)
Building or other structure	371	399	346	330	304	351	310	270	256	1.1%	-15
Hole or other opening	70	68	57	48	59	47	48	57	57	0.2%	-2 (NL)
Other level	2,398	2,557	2,539	2,675	2,866	2,805	2,826	2,883	2,601	11.2%	42 (NL)
Same level from slipping, tripping, or stumbling	5,977	7,582	8,049	7,835	7,480	8,395	9,050	8,680	8,463	36.5%	263
Same level from collision, pushing, or shoving by other person	124	127	119	92	110	114	101	97	73	0.3%	-5
Other or unspecified	7,209	8,073	8,008	8,274	8,463	8,459	8,731	8,868	8,588	37.1%	159

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 25a. Number of ED visits resulting from unintentional falls by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	201,494	221,077	230,781	240,044	258,830	283,895	299,478	307,839	312,911
<b>Sex</b>									
Males	89,709	98,065	102,491	105,807	113,895	124,947	131,326	133,889	134,135
Females	111,785	123,012	128,290	134,237	144,935	158,948	168,152	173,950	178,776
<b>Age</b>									
< 1 yr	2,569	2,524	2,591	2,757	3,311	3,367	3,619	3,981	3,541
1-4 yrs	19,020	19,462	19,696	20,642	24,426	24,797	25,374	27,207	25,390
5-14 yrs	33,922	34,372	34,361	35,003	39,677	41,265	41,607	41,987	40,332
15-24 yrs	25,243	26,837	28,336	29,278	30,806	34,185	35,730	36,437	36,314
25-34 yrs	22,567	25,133	26,617	28,306	28,622	33,431	35,611	36,767	38,654
35-44 yrs	24,303	26,833	27,867	28,492	28,606	31,802	33,395	33,520	34,575
45-54 yrs	21,149	24,918	26,073	27,826	28,969	33,108	36,523	36,579	38,316
55-64 yrs	13,410	16,711	18,275	19,397	20,886	23,709	26,291	27,317	29,368
65-74 yrs	12,413	14,022	14,904	15,092	16,483	18,369	19,807	20,481	21,431
75-84 yrs	16,535	18,536	19,491	20,167	21,770	23,082	23,495	24,186	24,572
85 or older	10,363	11,729	12,570	13,084	15,274	16,780	18,026	19,377	20,418

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 25b. ED visit rates per 100,000 resulting from unintentional falls by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1,766	1,931	2,014	2,095	2,260	2,474	2,604	2,666	2,711	125.8
<b>Sex†</b>										
Males	1,640	1,793	1,874	1,935	2,087	2,285	2,395	2,440	2,444	109.1
Females	1,858	2,035	2,119	2,219	2,392	2,623	2,774	2,855	2,942	141.8
<b>Age</b>										
< 1 yr	1,746	1,712	1,736	1,882	2,235	2,221	2,372	2,695	2,547	129.4
1-4 yrs	3,161	3,254	3,307	3,473	4,161	4,218	4,292	4,597	4,364	192.6
5-14 yrs	2,100	2,150	2,176	2,253	2,585	2,724	2,780	2,810	2,649	97.6
15-24 yrs	1,595	1,683	1,776	1,838	1,947	2,171	2,273	2,328	2,289	100.6
25-34 yrs	1,530	1,714	1,822	1,942	1,965	2,288	2,433	2,487	2,741	145.6
35-44 yrs	1,392	1,572	1,663	1,729	1,763	1,996	2,147	2,205	2,336	115.2
45-54 yrs	1,285	1,490	1,537	1,620	1,668	1,894	2,086	2,085	2,199	113.6
55-64 yrs	1,238	1,485	1,564	1,598	1,662	1,825	1,973	1,971	2,022	94.0
65-74 yrs	1,609	1,824	1,942	1,970	2,143	2,348	2,454	2,451	2,521	115.5
75-84 yrs	2,989	3,334	3,507	3,639	3,962	4,252	4,392	4,461	4,539	119.4
85 or older	5,486	5,985	6,271	6,322	7,110	7,541	7,884	8,520	8,861	425.8

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 25c. Number and percentage of ED visit rates resulting from unintentional falls by year and cause, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Steps or stairs	27,520	28,515	29,863	32,452	36,919	38,292	40,386	41,963	42,847	13.7%	2,142
Ladders or scaffolding	4,925	5,142	5,417	5,586	6,423	6,307	6,317	6,478	6,347	2.0%	204
Building or other structure	1,183	1,126	1,201	1,141	1,280	1,378	1,425	1,329	1,158	0.4%	20 (NL)
Hole or other opening	1,650	1,556	1,476	1,525	1,552	1,655	1,561	1,608	1,676	0.5%	9 (NL)
Other level	29,206	30,266	31,549	33,115	36,849	38,448	39,866	41,594	40,920	13.1%	1,713
Same level from slipping, tripping, or stumbling	63,412	77,448	80,965	81,981	81,104	97,727	108,420	108,688	111,305	35.6%	5,933
Same level from collision, pushing, or shoving by other person	3,778	4,095	3,511	3,786	4,196	4,082	4,037	4,109	3,141	1.0%	-19 (NL)
Other or unspecified	69,830	72,936	76,802	80,459	90,541	96,026	97,470	102,250	105,545	33.7%	4,795

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 26a. Prevalence of adults aged 65 or older who fell in last 3 months, Ohio, 2006, 2008, and 2010**

	2006		2008		2010	
	Percent	95% CI	Percent	95% CI	Percent	95% CI
None	85.7	(82.7-88.7)	83.0	(81.6-84.5)	82.7	(81.1-84.4)
1 time	9.1	(6.7-11.4)	11.3	(10.1-12.5)	10.9	(9.6-12.3)
2 to 3 times	4.7	(2.7-6.7)	4.5	(3.6-5.3)	5.1	(4.1-6.2)
4 or more times	*	-	1.3	(0.8-1.7)	1.2	(0.8-1.7)

\*Suppressed due to small cell sizes

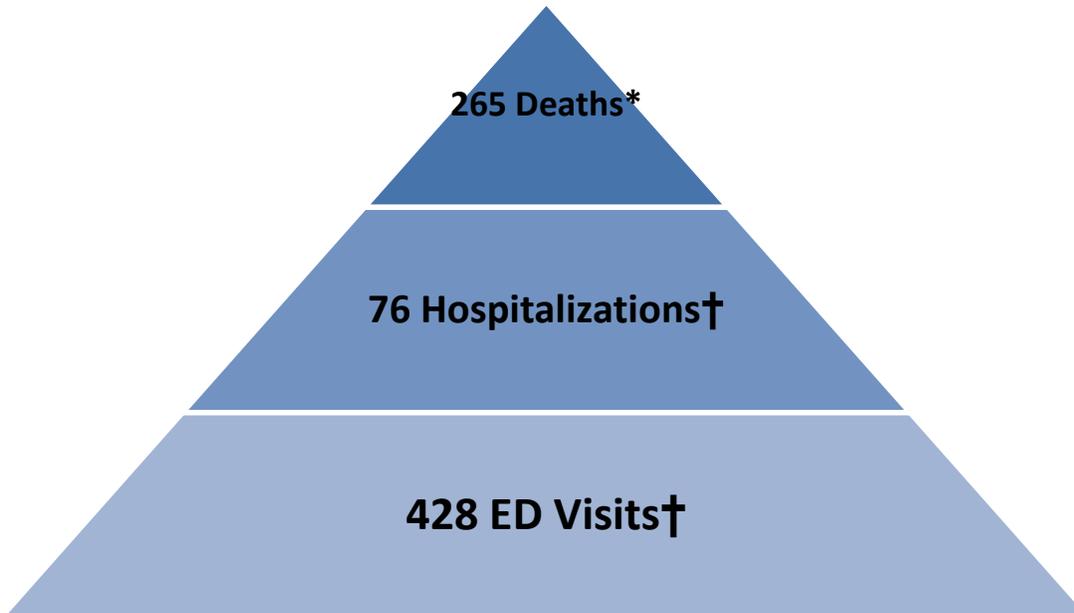
Source: Ohio Behavioral Risk Factor Surveillance System

**Table 26c. Prevalence of adults aged 65 or older who injured by a fall in last 3 months, Ohio, 2006, 2008, and 2010**

	2006		2008		2010	
	Percent	95% CI	Percent	95% CI	Percent	95% CI
Injured	31.6	(20.8-42.4)	30.2	(25.9-34.5)	33.9	(29.0-38.9)

Source: Ohio Behavioral Risk Factor Surveillance System

## SECTION 3.6: SUFFOCATIONS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

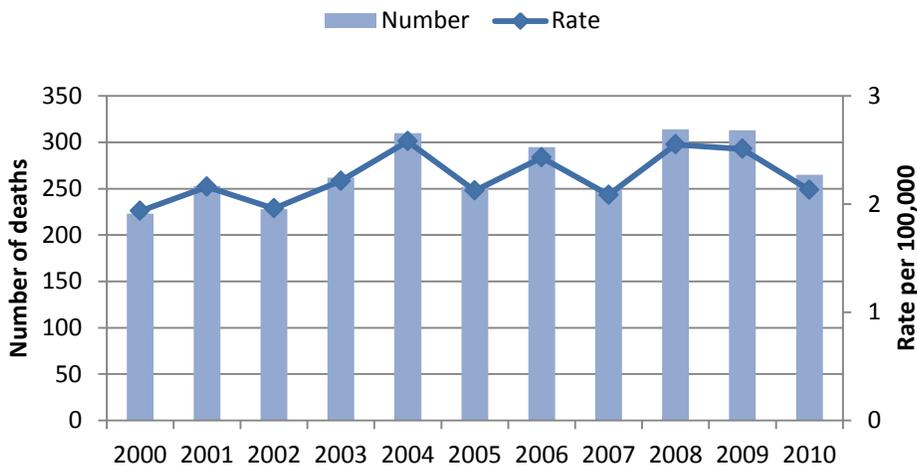
#### Patterns:

- Highest rates of fatal and non-fatal unintentional suffocations were found among children less than 5 years of age and adults 85 or older.
- Most fatal suffocations were caused by a non-food object for all ages while most fatal suffocations among infants occurred in a bed.
- Most non-fatal suffocations were caused by a non-food object for both children and adults.
- 29% of mothers reported unsafe sleeping practices with their infants.

#### Trends:

- Death and ED visit rates did not follow a consistent linear trend.
- Hospitalization rates have increased 46 percent since 2002.
- Death rates among infants increased 73 percent from 2000-2002 to 2008-2010.
- Fatal suffocations in bed and from food objects increased since 2000.
- Food and non-food objects have caused most non-fatal suffocations since 2002.
- 1 in 3 mothers reported unsafe sleep practices with their infants throughout the study period.

**Figure 8.1. Number and age adjusted rate for unintentional suffocation deaths by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**DEATHS:**

In 2010, 265 deaths resulted from unintentional suffocations in Ohio. The death rate was 2.1 per 100,000 (Figure 8.1). Males were more likely to die from suffocation than females (2.6 versus 1.8 per 100,000). The distribution of suffocation deaths varied by age. The highest rates were found among children less than 1 year (34.1 per 100,000) and adults ages 85 or older (30.6 per 100,000) (Figure 8.2). Suffocation fatality rates were similar among whites and blacks. See Table 8.1 for an unintentional suffocation death risk profile.

Nearly one-half of fatal suffocations were caused by the ingestion of non-food objects (49 percent). Food objects caused 22 percent of suffocations and 12 percent of suffocations were in bed (Figure 8.3).

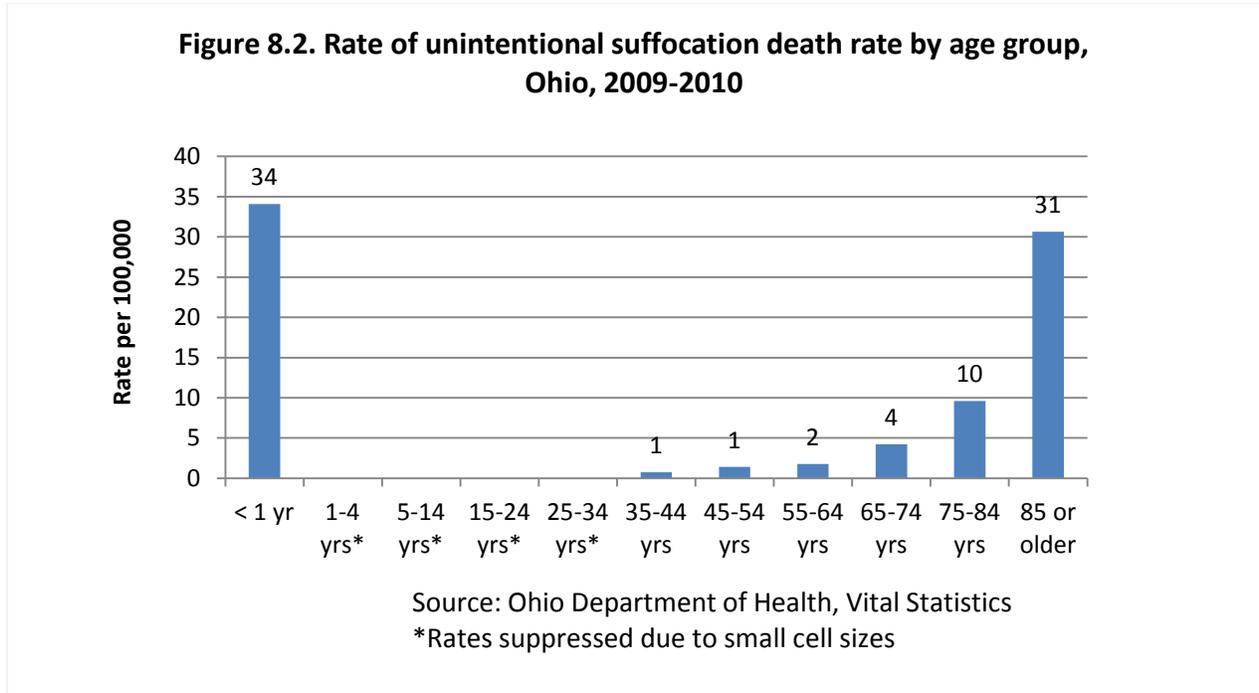
Table 8.1 Unintentional Suffocation Death Risk Profile		
	2010 At Risk Groups	Annual trend since 2000
Overall		Inconsistent trend
Sex	Males	Inconsistent trend
Age	< 1 yr	< 1 year (+2/100,000)
Race and ethnicity	Similar among whites and blacks	Inconsistent trend

**TRENDS:**

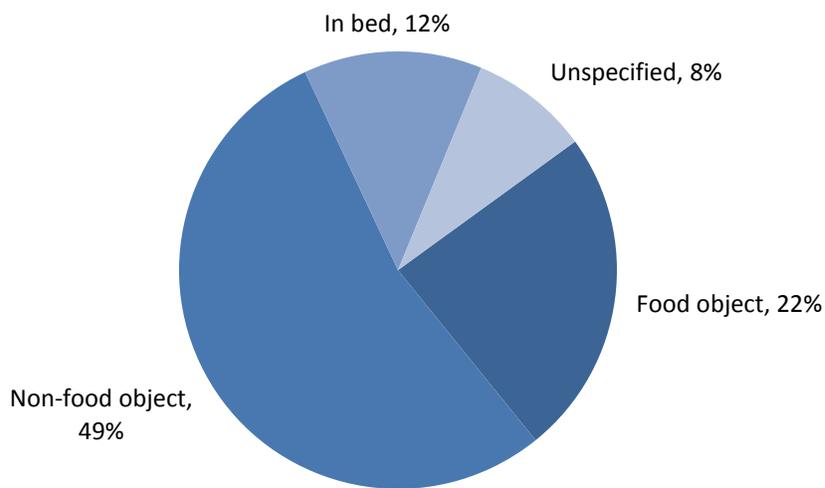
The suffocation death rate did not follow a consistent trend since 2000 (Figure 8.1). Death rates among males were consistently higher than females throughout the study period. Fatality rates among children less than 1 year and adults ages 85 or older were consistently higher than other age groups. The suffocation fatality rate for children less than 1 year of age increased while rates fluctuated up and down for other age groups. Non-food objects, food objects, and suffocation in bed were the most common mechanisms of suffocation throughout the study period. The number of fatal suffocations in bed and resulting from food objects

Ohio Violence and Injury Prevention Program, Ohio Department of Health

increased while suffocations resulting from ingestion of non-food objects fluctuated during the study period. See Tables 27a-c located at the end of this section for more detailed information on the number and rate of suffocation deaths in Ohio.

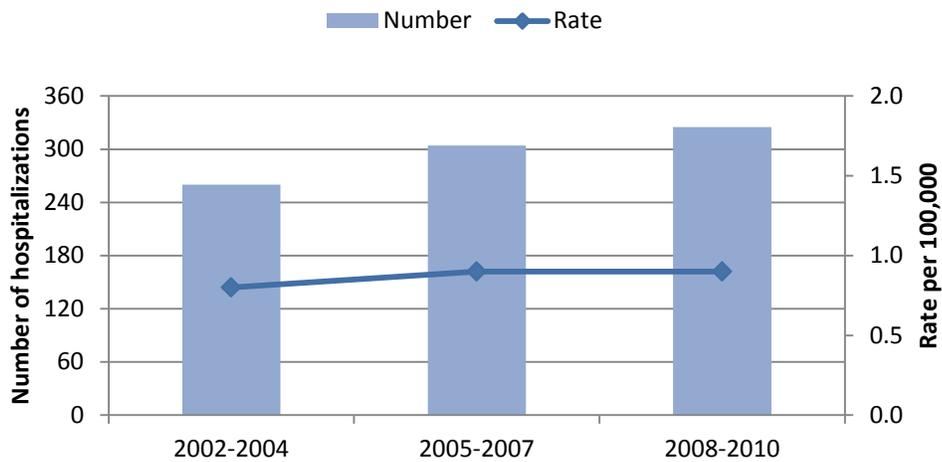


**Figure 8.3. Distribution of deaths resulting from unintentional suffocations by object, Ohio, 2010**



Source: Ohio Department of Health, Vital Statistics

**Figure 8.4. Number and age adjusted rate for unintentional suffocation hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

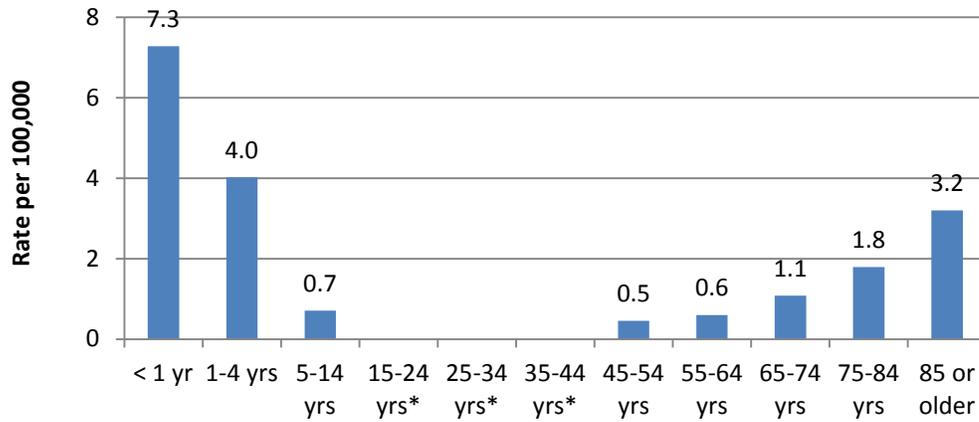
In 2008-2010, 325 hospitalizations resulted from unintentional suffocations. The suffocation hospitalization rate was 0.9 per 100,000 (Figure 8.4). The hospitalization rate was similar for males and females. The highest rates of hospitalizations were found among infants less than 1 year of age (7.3 per 100,000), children 1-4 years (4.0 per 100,000), and adults 85 or older (3.2 per 100,000). The lowest rates were found among individuals 5-54 years of age (Figure 8.5). Between 2008 and 2010, the majority of hospitalizations were caused by the ingestion or inhalation of a non-food object (54 percent) followed by ingestion or inhalation of a food object (41 percent) causing obstruction of the respiratory tract. Approximately 5 percent of hospitalizations were caused by unintentional mechanical suffocation.

Table 8.2 Unintentional Suffocation Hospitalization Risk Profile		
	2008-2010 At Risk Groups	Annual trend since 2002
Overall		+24%
Sex	Similar for males and females	Males (largest increase)
Age	< 1 year	1-4 (largest increase)

**TRENDS:**

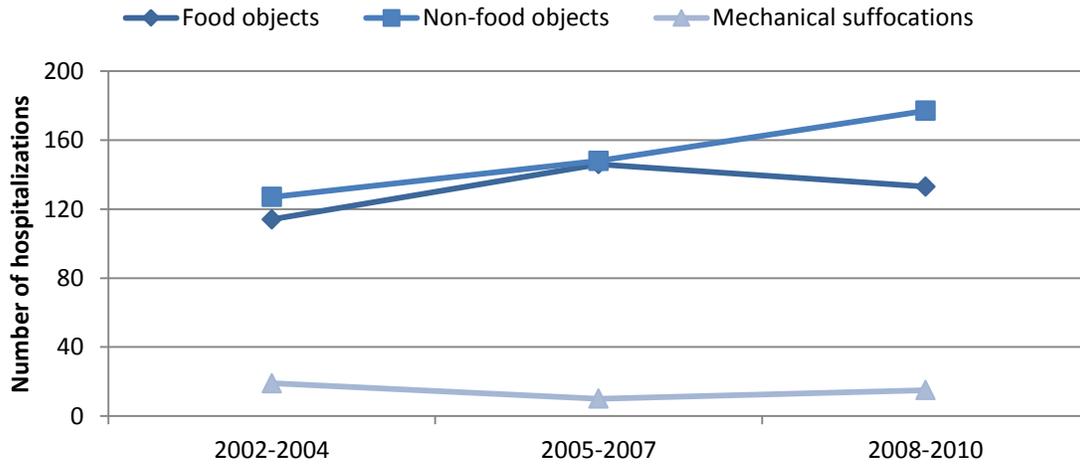
Hospitalization rates resulting from unintentional suffocations increased 24 percent from 0.75 per 100,000 in 2002-2004 to 0.93 per 100,000 in 2008-2010. An increase was found among males while rates did not change among females. Hospitalization rates increased among children ages 5-14 or younger and adults ages 45-54 65-74 while rates decreased among adults ages 75-84. The distribution in the causes of the suffocation changed between 2002-2004 and 2008-2010. Suffocations resulting from non-food objects increased and surpassed food objects as the leading cause of suffocation related hospitalizations (Figure 8.6). See Tables 28a-c for more detailed information on the number and rate of unintentional suffocation hospitalizations.

**Figure 8.5. Rate of unintentional suffocation hospitalizations by age group, Ohio, 2008-2010**

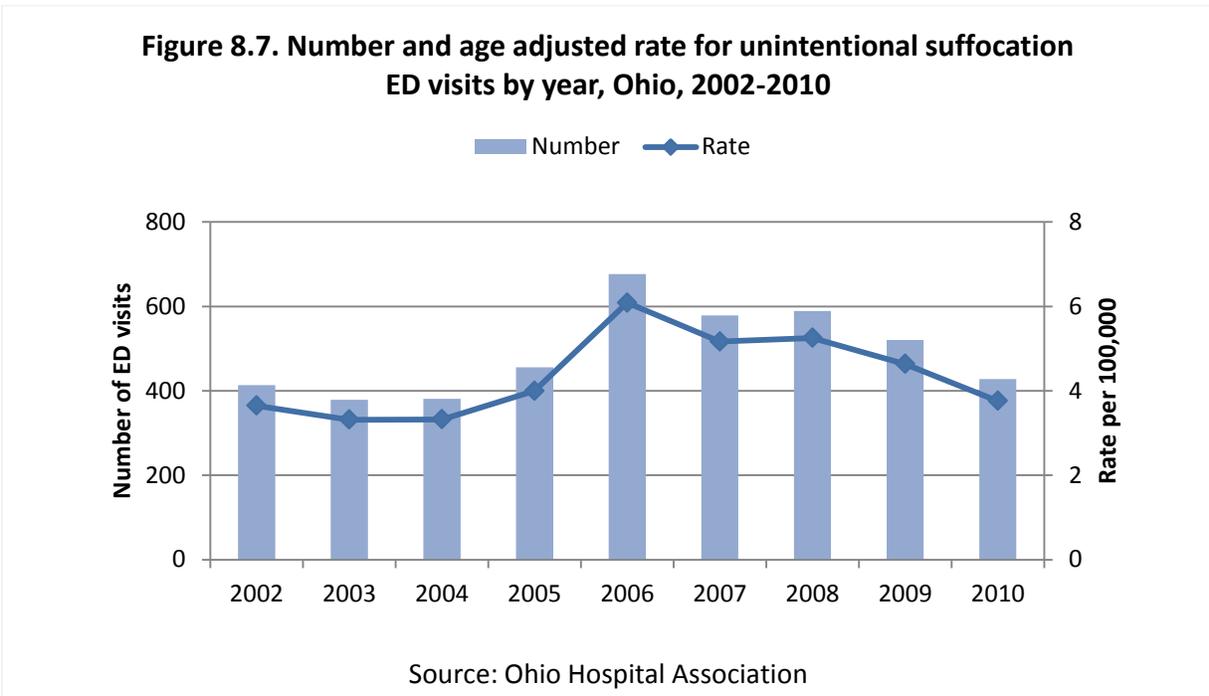


Source: Ohio Hospital Association  
 \*Rates suppressed due to small cell sizes

**Figure 8.6. Number of hospitalizations resulting from unintentional suffocations by object, Ohio, 2002-2010**



Source: Ohio Hospital Association



**EMERGENCY DEPARTMENT VISITS:**

Approximately 400 emergency department (ED) visits resulted from unintentional suffocations in 2010. The ED visit rate was 3.8 per 100,000 (Figure 8.7). The rate of unintentional suffocation ED visits was slightly higher among males compared to females (4.1 versus 3.4 per 100,000). The distribution of ED visits by age is bimodal with the highest rates occurring among children 4 years of age or younger and adults ages 85 or older. Rates of ED visits among individuals between ages 5 and 74 were low (Figure 8.8). See Table 8.3 for an unintentional suffocation ED visit risk profile.

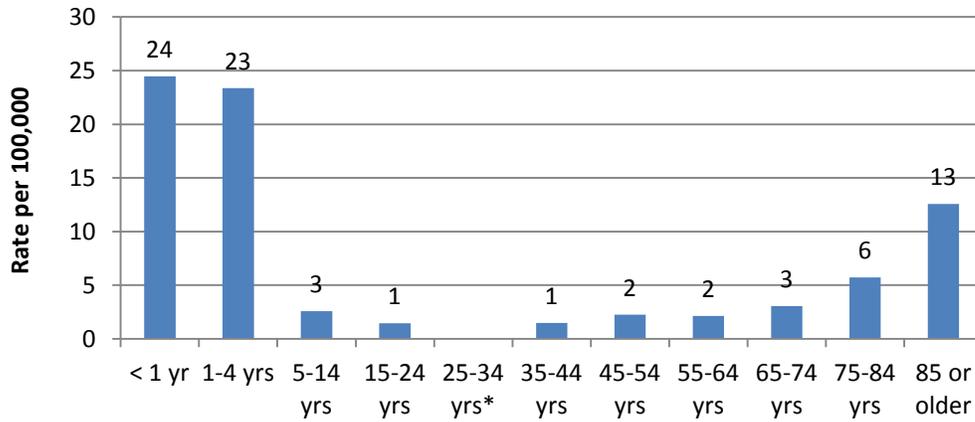
Table 8.3 Unintentional Suffocation ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		Inconsistent trend
Sex	Males	Similar for males and females
Age	0-4 yrs	Inconsistent trend

The majority of the suffocation ED visits resulted from inhalation or ingestion of a non-food (50 percent) or a food object (44 percent) that caused an obstruction in the respiratory tract. Approximately 5 percent were caused by an unintentional mechanical obstruction (Figure 8.9).

**TRENDS:**

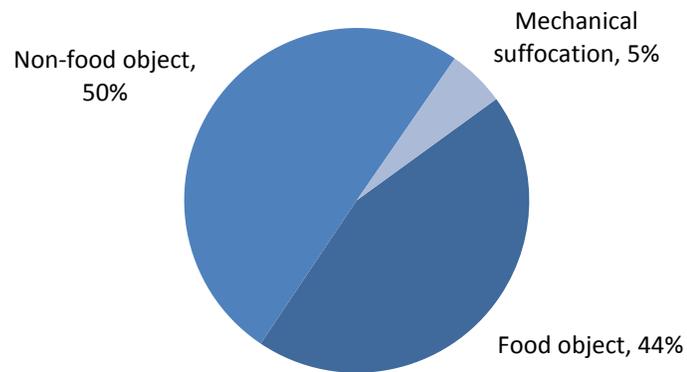
ED visit rates resulting from unintentional suffocations fluctuated throughout the study period but did not follow a consistent linear trend. This pattern was consistent among males and females as well as across all age groups. The distribution in the cause of the suffocation resulting in an ED visit did not change between 2002 and 2010. Food and non-food objects caused approximately 95 percent of suffocations throughout the study period. See Tables 29a-c located at the end of this section for more detailed information on the number and rate of unintentional suffocation ED visits.

Figure 8.8. ED visit rates per 100,000 for unintentional suffocations by age, Ohio, 2008-2010



Source: Ohio Hospital Association  
\*Rates suppressed due to small cell sizes

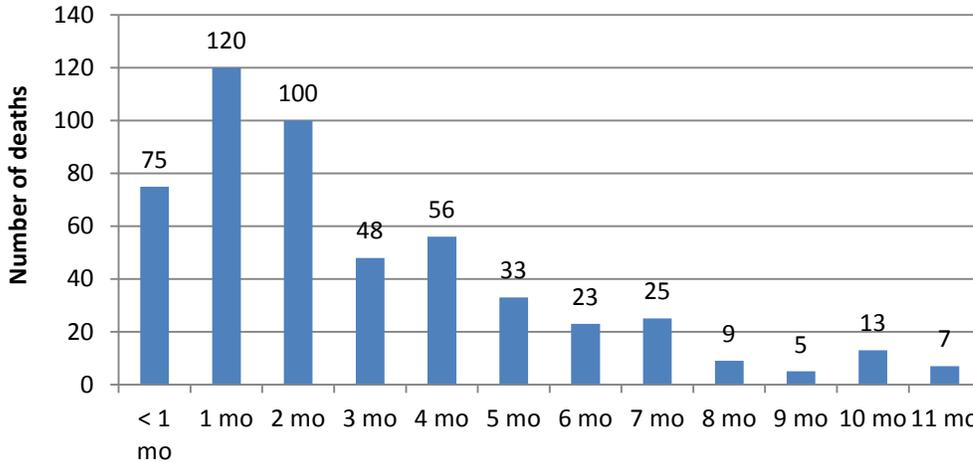
Figure 8.9. Distribution of ED visits resulting from unintentional suffocations by object, Ohio, 2010



Source: Ohio Hospital Association

## SECTION 3.6A: INFANT SLEEP RELATED SUFFOCATION

**Figure 8.10. Number of unintentional suffocation deaths among infants by age in months, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

### FINDINGS FROM DEATH CERTIFICATES

Nearly 500 infants less than 1 year of age died from an unintentional suffocation between 2000 and 2010. Most of the deaths occurred among males and infants aged 3 months or younger (see Figure 8.10). While most infant suffocation deaths occurred among whites, the death rate among black infants (66 per 100,000) was three times higher than among white infants (22 per 100,000). See Table 8.4 for an infant unintentional suffocation death risk profile.

Sixty-seven percent (329 deaths) of the fatal suffocations occurred in a bed. Approximately 20 percent of the suffocation deaths were unspecified and 8 percent were caused by other listed threats to breathing. See Table 30 located at the end of this section for more detailed information on the number of infant suffocation deaths in Ohio.

**Table 8.4 Infant Unintentional Suffocation Death Risk Profile**

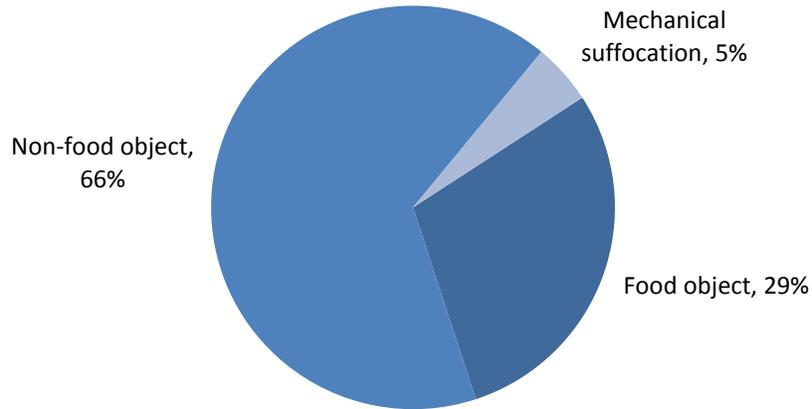
	2010 At Risk Groups
Sex	Males
Age	< 4 months old
Race and ethnicity	Blacks

### FINDINGS FROM CHILD FATALITY REVIEW

Approximately 1,000 deaths among infants less than 1 year of age were reviewed by child fatality review teams in Ohio in 2006-2009. Sleep-related deaths (including those attributed to sudden infant death syndrome or SIDS) accounted for 14 percent (153 deaths) of the total infant deaths reviewed. Sleep related deaths were the second leading cause of death reviewed after prematurity. Fifty-eight percent of sleep related deaths occurred on locations considered to be unsafe such as adult beds and couches. Approximately one-half of the deaths occurred to infants who were sharing a sleeping surface with someone at the time of

the death. See Ohio Child Fatality Review Eleventh Annual Report for more detailed information on findings from child fatality review teams.

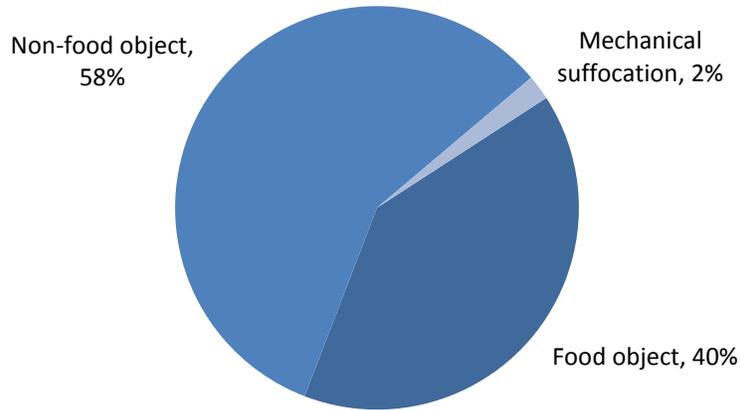
**Figure 8.11. Distribution of hospitalizations resulting from unintentional suffocations by object among infants, Ohio, 2002-2010**



**HOSPITALIZATIONS:**

Between 2002 and 2010, 103 hospitalizations resulted from an unintentional infant suffocation. Fifty-five percent of hospitalizations occurred among males while 45 percent were among females. Most suffocations were caused by a non-food object (66 percent) followed by a food object (29 percent) and a mechanical suffocation (5 percent) (Figure 8.11). Mechanical suffocations included suffocations that took place in a bed or cradle, were caused by a plastic bag, resulted from a lack of air in a closed place, or other specified means. See Table 31 located at the end of this section for more detailed information on unintentional suffocations among infants in Ohio.

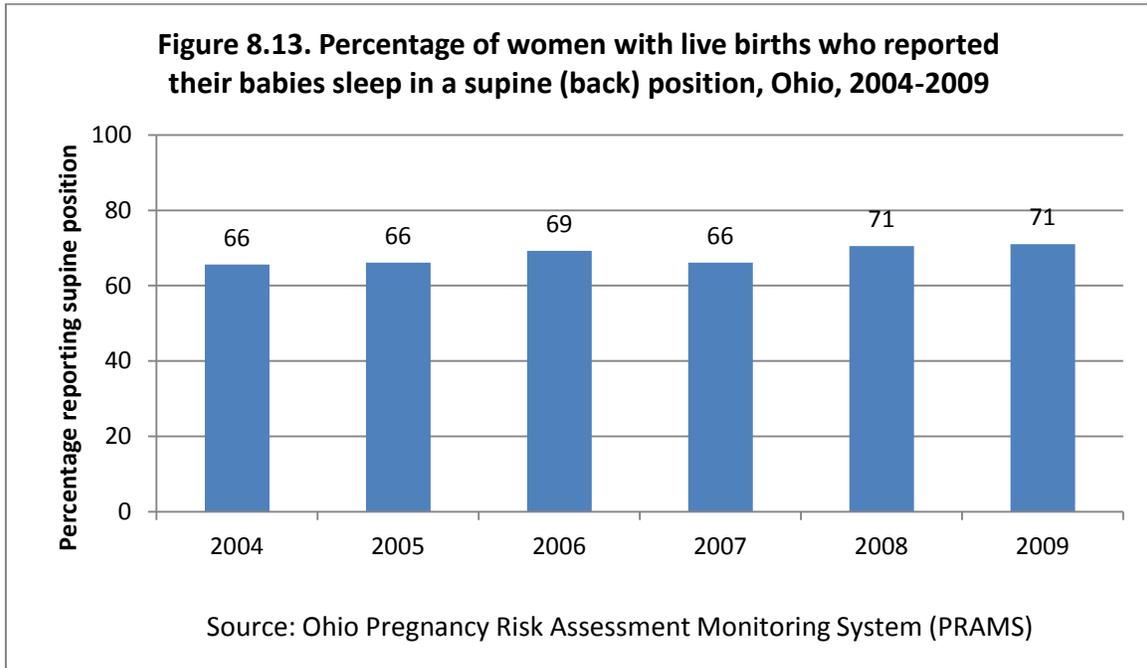
**Figure 8.12. Distribution of ED visits resulting from unintentional suffocations by object among infants, Ohio, 2002-2010**



**EMERGENCY DEPARTMENT VISITS:**

Between 2002 and 2010, 484 ED visits resulted from an unintentional suffocation among infants. The percentage of ED visits resulting from infant suffocations was similar among males (47 percent) than females (53 percent). Most ED visits resulting from infant suffocations were caused by a non-food object (58 percent) while 40 percent resulted from a food object and 2 percent resulted from a mechanical suffocation (Figure 8.12). See Table 32 for more detailed information on ED visits resulting from unintentional suffocations among infants.

## SECTION 3.6B: SAFE SLEEPING PRACTICES



The American Academy of Pediatrics has developed recommendations for safe infant sleep practices and safe sleep environments. These recommendations include placing babies in a supine (back) sleep position in a crib free from toys, blankets, soft bedding and pillows. The supine position increases pulmonary function and oxygenation compared to the prone (stomach) position. Removing objects in the crib reduces the risk of the infant suffocating on those objects.<sup>2</sup>

The Ohio Pregnancy Risk Assessment Monitoring System (PRAMS) assesses infant sleep practices among women who have had a live birth. In 2009, 71 percent of women surveyed reported placing their infants in a supine sleep position. The percentage of women who reported putting their infants in a supine sleeping position varied by socio-demographic characteristics. The lowest rates of infant supine sleeping were found among mothers younger than 20 years of age, African Americans, unmarried, and completed less than 12 years of education.<sup>3</sup> Infant sleep practices also varied by region in Ohio with highest percentage of supine sleeping found in the Toledo Region (77 percent) and the lowest percentage found in the Columbus Region (62 percent).<sup>4</sup>

Since 2004, the percentage of mothers placing their infants in a supine sleeping position has increased slightly from 66 percent in 2004 to 71 percent in 2009 (see Figure 8.13).<sup>5</sup> See PRAMS Data Summary, 2004-2009 for more detailed information on safe sleeping practices reported by mothers in Ohio.

<sup>2</sup> American Academy of Pediatrics, Sudden Infant Death Syndrome Policy Recommendations

<sup>3</sup> Ohio Department of Health, Infant Sleeping Position Fact Sheet, 2006-2008

<sup>4</sup> Ohio Department of Health, Ohio PRAMS Regional Data Summary, 2006-2007

<sup>5</sup> Ohio Department of Health, Ohio PRAMS Data Summary, 2004-2009

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 27a. Number of deaths resulting from unintentional suffocations, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	223	253	228	262	310	252	295	251	314	313	265
<b>Sex</b>											
Males	130	137	123	141	158	131	156	138	173	163	141
Females	93	116	105	121	152	121	139	113	141	150	124
<b>Age</b>											
< 1 yr	23	26	40	40	45	53	51	58	66	56	42
1-4 yrs	8	<5	<5	9	7	5	<5	10	<5	5	5
5-14 yrs	<5	8	6	<5	5	7	11	<5	<5	<5	<5
15-24 yrs	11	6	8	8	5	7	5	6	6	10	<5
25-34 yrs	6	8	<5	<5	7	7	7	<5	7	7	10
35-44 yrs	18	13	18	14	10	12	13	15	12	11	11
45-54 yrs	9	26	17	13	22	10	25	17	19	32	17
55-64 yrs	14	14	16	14	21	21	28	14	19	26	24
65-74 yrs	24	36	27	25	23	23	28	19	35	36	35
75-84 yrs	49	63	48	73	70	43	51	54	65	56	48
85 or older	58	49	42	62	95	64	72	52	80	72	68
<b>Race and ethnicity</b>											
White‡	188	214	187	229	262	210	241	210	252	266	226
Black‡	33	37	37	29	42	38	48	37	55	43	36
Hispanic	<5	0	<5	<5	<5	<5	5	<5	5	<5	<5
Other‡	0	<5	<5	<5	<5	<5	0	<5	<5	<5	<5

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 27b. Death rates per 100,000 resulting from unintentional suffocations, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.9	2.2	2.0	2.2	2.6	2.1	2.4	2.1	2.6	2.5	2.1	<0.1 (NL)
<b>Sex†</b>												
Males	2.7	2.8	2.5	2.8	3.3	2.6	3.1	2.7	3.3	3.1	2.6	<0.1 (NL)
Females	1.3	1.7	1.6	1.7	2.1	1.7	2.0	1.6	2.0	2.1	1.8	<0.1 (NL)
<b>Age</b>												
< 1 yr		19.7		28.6		35.3		41.5		34.1		1.96
1-4 yrs		*		*		*		*		*		*
5-14 yrs		*		*		*		*		*		*
15-24 yrs		0.5		*		*		*		*		*
25-34 yrs		*		*		*		*		*		*
35-44 yrs		0.9		0.7		0.8		0.9		0.7		<-0.1 (NL)
45-54 yrs		1.1		1.0		1.0		1.0		1.4		<0.1 (NL)
55-64 yrs		1.4		1.5		2.0		1.3		1.8		<0.1 (NL)
65-74 yrs		3.7		3.1		3.3		3.4		4.2		<0.1 (NL)
75-84 yrs		9.7		12.8		8.4		10.8		9.6		<-0.1 (NL)
85 or older		27.4		40.9		33.5		30.4		30.6		<-0.1 (NL)
<b>Race and ethnicity†</b>												
White‡	1.8	2.1	1.8	2.2	2.5	2.0	2.3	2.0	2.4	2.5	2.1	<0.1 (NL)
Black‡	2.8	3.0	3.1	2.4	3.7	3.0	3.4	2.7	4.1	3.2	2.5	<0.1 (NL)
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths.

†Rates are age adjusted to 2000 U.S. standard population

‡Non-Hispanic

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 27c. Number of deaths resulting from unintentional suffocations, by mechanism and year, Ohio, 2000-2010**

Cause of Suffocation	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Suffocation in bed	17	10	31	33	30	35	43	47	46	46	32	12%	2.7
Other suffocation	14	16	17	12	11	6	18	10	7	7	5	2%	*
Cave-in, falling earth, and other substances	<5	<5	<5	<5	0	<5	<5	0	<5	<5	<5	<1%	*
Inhalation of gastric contents	19	25	11	14	16	9	6	10	14	10	13	5%	*
Ingestion of food	21	32	30	20	43	32	47	35	40	46	57	22%	2.7
Ingestion of other objects	130	139	112	163	179	128	152	125	164	165	129	49%	1.4 (NL)
Low oxygen environment	0	0	<5	0	0	0	0	<5	0	0	0	0%	*
Other specified	6	5	9	5	7	22	9	<5	16	13	6	2%	*
Unspecified	12	24	15	12	24	18	17	19	25	25	22	8%	*

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 28a. Number of hospitalization resulting from unintentional suffocations, by year, Ohio, 2002-2010**

	<b>2002-2004</b>	<b>2005-2007</b>	<b>2008-2010</b>
Overall	260	304	325
<b>Sex</b>			
Males	128	169	174
Females	132	135	151
<b>Age</b>			
< 1 yr	28	42	33
1-4 yrs	38	61	71
5-14 yrs	20	20	34
15-24 yrs	9	13	14
25-34 yrs	<5	11	10
35-44 yrs	26	19	8
45-54 yrs	19	24	26
55-64 yrs	23	28	31
65-74 yrs	30	27	34
75-84 yrs	46	41	38
85 or older	17	18	26

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 28b. Hospitalization rates per 100,000 resulting from unintentional suffocations, by year, Ohio, 2002-2010**

	2002-2004	2005-2007	2008-2010	Trend (per yr)
Overall†	0.75	0.88	0.92	0.03
<b>Sex†</b>				
Males	0.80	1.04	1.06	0.04
Females	1.16	1.09	1.25	NL
<b>Age</b>				
< 1 yr	6.31	9.41	7.28	0.2 (NL)
1-4 yrs	2.12	3.45	4.02	0.32
5-14 yrs	0.42	0.43	0.71	0.05
15-24 yrs	*	*	*	*
25-34 yrs	*	*	*	*
35-44 yrs	0.51	0.39	*	*
45-54 yrs	0.38	0.46	0.46	0.01
55-64 yrs	0.68	0.74	0.60	-0.01 (NL)
65-74 yrs	1.30	1.17	1.08	0.04
75-84 yrs	2.76	2.49	1.79	-0.16
85 or older	2.90	2.79	3.20	0.05 (NL)

\*Rate suppressed due to less than 20 hospitalizations

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

†Rates are age adjusted to 2000 U.S. standard population

**Table 28c. Number of hospitalizations resulting from unintentional suffocations, by cause and year, Ohio, 2002-2010**

	2002-2004	2005-2007	2008-2010	% in 2008-10	Trend (per yr)
<b>Suffocation Cause</b>					
Food object	127	146	133	41%	1 (NL)
Non-food object	114	148	177	54%	11
Mechanical suffocation	19	10	15	5%	*

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 29a. Number of ED visits resulting from unintentional suffocations by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	414	379	381	456	677	579	589	521	428
<b>Sex</b>									
Males	224	186	207	241	377	285	302	279	226
Females	190	193	174	215	300	294	287	242	202
<b>Age</b>									
< 1 yr	39	40	34	48	87	85	62	55	34
1-4 yrs	115	84	88	120	214	178	206	183	136
5-14 yrs	37	28	31	47	119	72	91	80	39
15-24 yrs	24	25	16	26	35	28	33	26	23
25-34 yrs	17	18	26	10	17	17	9	15	18
35-44 yrs	23	25	23	30	33	32	29	15	22
45-54 yrs	32	32	35	35	37	32	49	28	39
55-64 yrs	37	26	34	38	33	29	30	22	31
65-74 yrs	42	33	33	39	33	41	30	36	26
75-84 yrs	31	43	43	30	41	43	27	34	31
85 or older	17	25	18	33	28	22	23	27	29

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

**Ohio Violence and Injury Prevention Program, Ohio Department of Health**

**Table 29b. ED visit rates per 100,000 resulting from unintentional suffocations by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	3.6	3.3	3.3	4.0	6.1	5.2	5.3	4.6	3.8	0.2 (NL)
<b>Sex†</b>										
Males	4.2	3.5	3.8	4.4	6.9	5.2	5.5	5.1	4.1	0.1 (NL)
Females	3.3	3.2	2.9	3.6	5.3	5.1	5.0	4.2	3.4	0.2 (NL)
<b>Age</b>										
< 1 yr	26.5	27.1	22.8	32.8	58.7	56.1	40.6	37.2	24.5	1.4 (NL)
1-4 yrs	19.1	14.0	14.8	20.2	36.5	30.3	34.8	30.9	23.4	2.0 (NL)
5-14 yrs	2.3	1.8	2.0	3.0	7.8	4.8	6.1	5.4	2.6	0.4 (NL)
15-24 yrs	1.5	1.6	*	1.6	2.2	1.8	2.1	1.7	1.4	*
25-34 yrs	*	*	3.6	*	*	*	*	*	*	*
35-44 yrs	1.3	1.5	1.4	1.8	2.0	2.0	1.9	*	1.5	*
45-54 yrs	1.9	1.9	2.1	2.0	2.1	1.8	2.8	1.6	2.2	<0.1 (NL)
55-64 yrs	3.4	2.3	2.9	3.1	2.6	2.2	2.3	1.6	2.1	-0.2 (NL)
65-74 yrs	5.4	4.3	4.3	5.1	4.3	5.2	3.7	4.3	3.1	-0.2 (NL)
75-84 yrs	5.6	7.7	7.7	5.4	7.5	7.9	5.0	6.3	5.7	-0.1 (NL)
85 or older	9.0	12.8	9.0	15.9	13.0	9.9	10.1	11.9	12.6	0.1 (NL)

\*Rates suppressed due to less than 20 ED visits

†Rates are age adjusted to 2000 U.S. standard population.

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 29c. Number of ED visits resulting from unintentional suffocations by object causing suffocation and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Cause of Suffocation</b>											
Food object	180	187	183	209	240	213	198	181	190	44%	1 (NL)
Non-food object	204	168	183	233	388	345	363	328	215	50%	17 (NL)
Mechanical suffocation	30	24	15	14	49	21	28	12	23	5%	*

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 30. Number and percent of infant suffocation deaths by sex, race/ethnicity, and mechanism, Ohio, 2000-2010**

	2000-2010 Number	2000-2010 Percent
Overall	490	
<b>Sex</b>		
Males	279	57%
Females	221	45%
<b>Race and ethnicity†</b>		
White‡	313	63.9%
Black‡	174	35.5%
Hispanic	10	2.0%
Other‡	3	0.6%
<b>Mechanism</b>		
Suffocation in bed	329	67.1%
Other suffocation	3	0.6%
Cave-in, falling earth, and other substances	0	0.0%
Inhalation of gastric contents	7	1.4%
Ingestion of food	3	1.0%
Ingestion of other objects	12	2.4%
Other specified	39	8.0%
Unspecified	97	19.8%

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 31. Number of hospitalizations resulting from unintentional suffocations among infants less than 1 year of age, by cause, Ohio, 2002-2010<sup>1</sup>**

	<b>2002- 2010 N</b>	<b>2002- 2010 %</b>
Overall	103	
Males	57	55%
Females	46	45%
Food object	30	29%
Non-food object	68	66%
Mechanical suffocation	5	5%

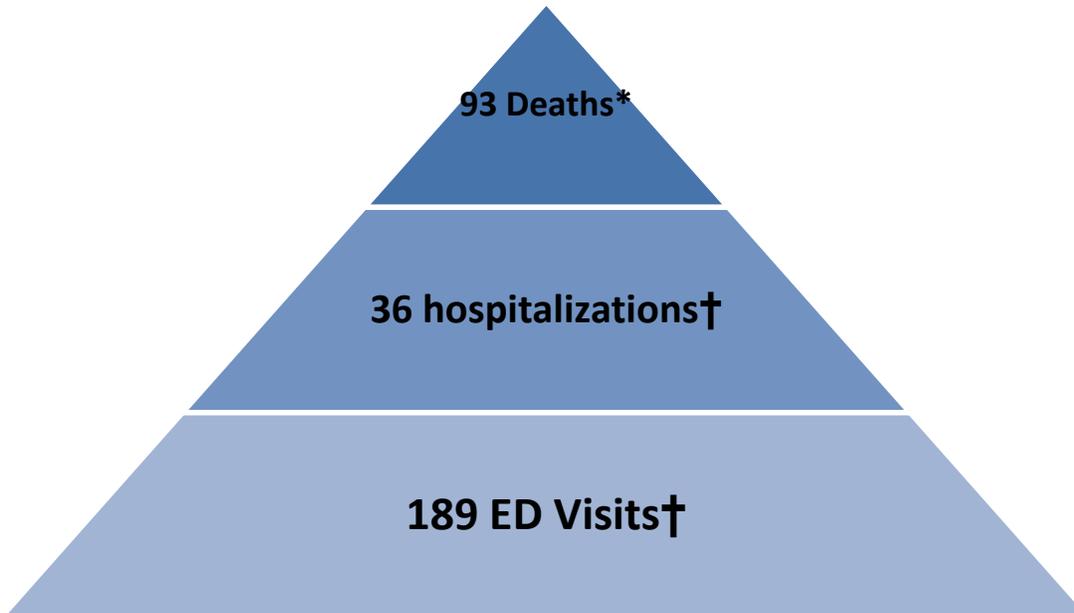
<sup>1</sup>Source: Ohio Hospital Association

**Table 32. Number and percent of ED visits resulting from unintentional suffocations among infants, Ohio, 2002-2010<sup>1</sup>**

	<b>2002-2010 Number</b>	<b>2002-2010 Percent</b>
Overall	484	
Males	226	47%
Females	258	53%
Food object	195	40%
Non-food object	281	58%
Mechanical suffocation	8	2%

<sup>1</sup>Source: Ohio Hospital Association

## SECTION 3.7: DROWNING



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

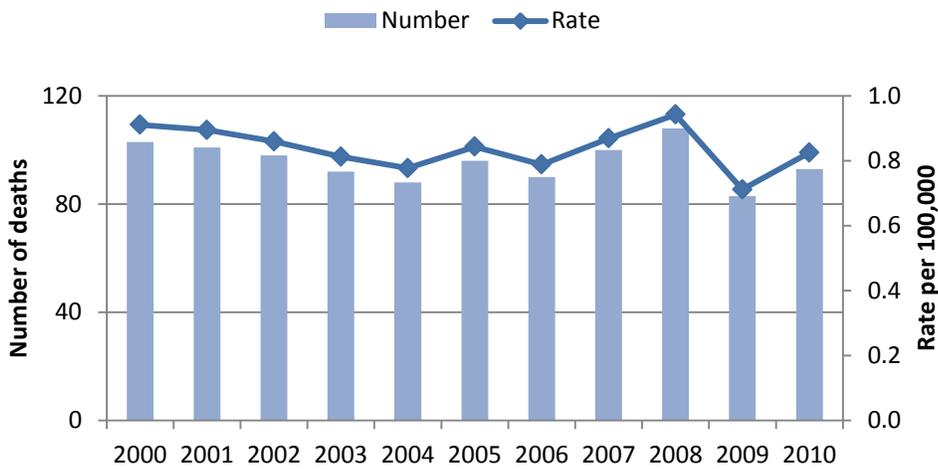
#### Patterns:

- Highest rates of fatal and non-fatal drowning were found among children less than 5 years of age.
- Rates of fatal or non-fatal drowning were higher among males than females.
- Nearly one-half of fatal drowning occurred in natural bodies of water.
- Unintentional drowning was the most common cause of non-fatal drowning.

#### Trends:

- Fatal and non-fatal drowning rates have not followed a consistent linear trend.
- Highest rates of fatal and non-fatal drowning were consistently found among children less than 5 years of age.
- Natural bodies of water were the most common location for fatal drowning since 2000.
- Unintentional drowning was most common cause of non-fatal drowning throughout the study period.

**Figure 9.1. Number and age adjusted rate for unintentional drowning deaths by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**DEATHS:**

In 2010, 93 people died from an unintentional drowning in Ohio. The drowning fatality rate was 0.83 per 100,000 (Figure 9.1). The fatality rate was 3 times higher among males (1.25 per 100,000) compared to females (0.42 per 100,000). The highest fatality rate was found among children ages 1-4 years at 2.2 per 100,000 which were 3 times higher than other age groups (Figure 9.2). Fatality rates were 50 percent higher among blacks (1.2 per 100,000) than whites (0.8 per 100,000). See Table 9.1 for an unintentional drowning death risk profile.

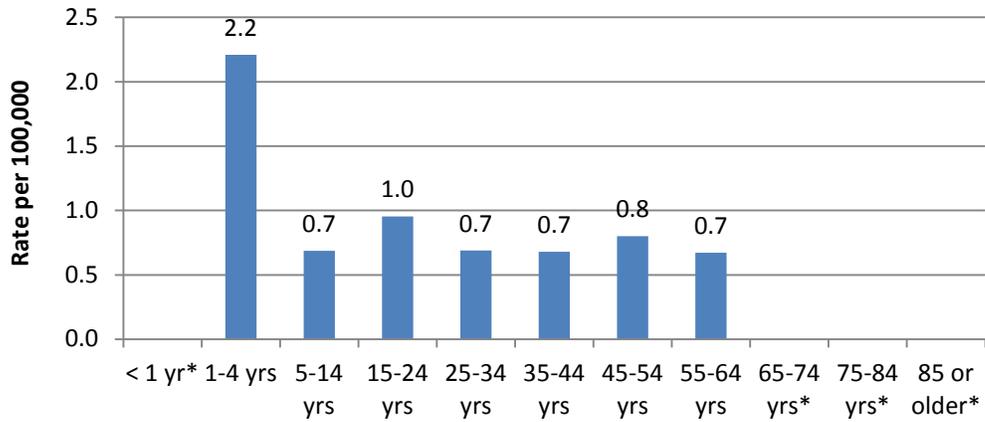
The most common place of occurrence for drowning was in a natural body of water (47 percent) followed by swimming pools (17 percent) (see Figure 9.3). Of note, 27 percent of drowning occurred in an unspecified location.

**TRENDS:**

Between 2000 and 2010, unintentional drowning fatality rates did not follow a consistent linear trend. Inconsistent trends were found by gender, age, and race or ethnicity. The number of fatal drowning in natural bodies of water increased on average by 2 drownings per year while the number of unspecified drowning decreased on average by 2 drownings per year. See Tables 34a-c located at the end of this section for more detailed information on the number and rates of unintentional drowning in Ohio.

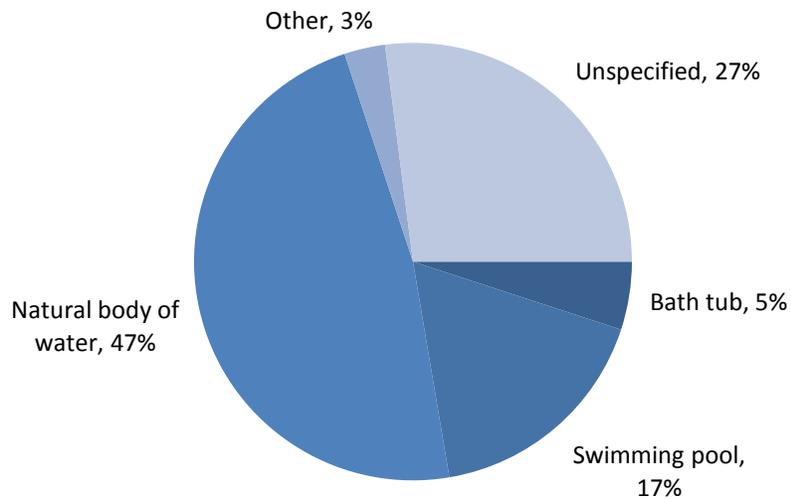
	<b>2010 At Risk Groups</b>	<b>Annual trend since 2000</b>
<b>Overall</b>		Inconsistent trends
<b>Sex</b>	Males	Inconsistent trends
<b>Age</b>	1-4 yrs	Inconsistent trends
<b>Race and ethnicity</b>	Blacks	Inconsistent trends

Figure 9.2. Rate of unintentional drowning death rate by age group, Ohio, 2008-2010



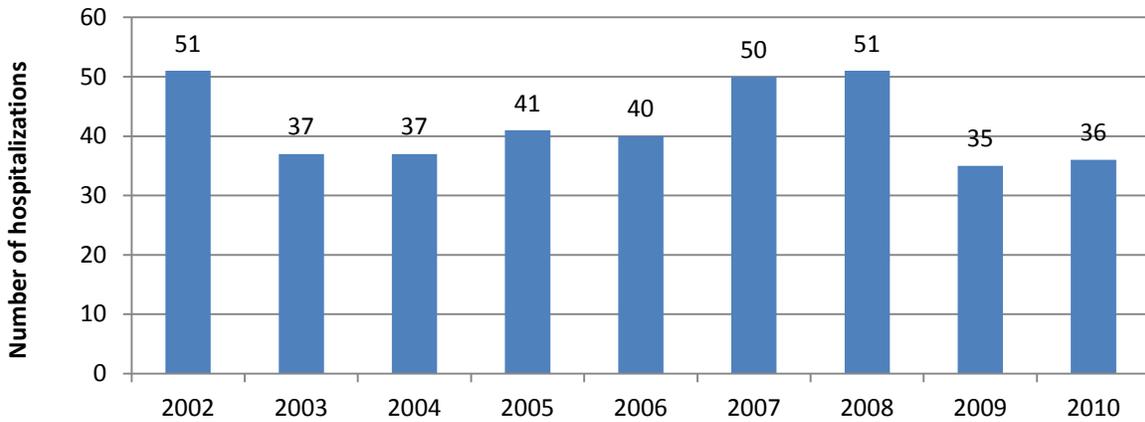
Source: Ohio Department of Health, Vital Statistics  
\*Rates suppressed due to small cell sizes

Figure 9.3. Distribution of deaths resulting from unintentional drowning by location, Ohio, 2010



Source: Ohio Department of Health, Vital Statistics

**Figure 9.4. Number of unintentional drowning hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

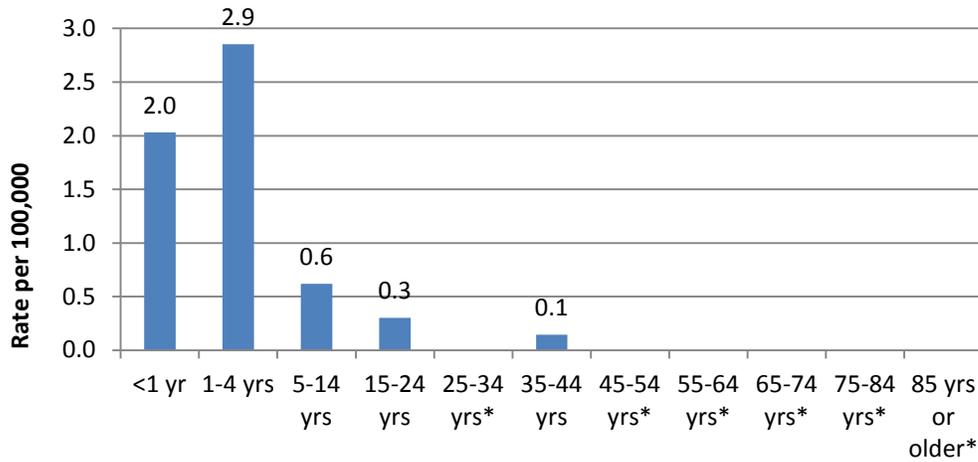
**HOSPITALIZATIONS:**

Between 2002 and 2010, 378 hospitalizations resulted from unintentional drowning (Figure 9.4). The drowning hospitalization rate was 0.39 per 100,000. The hospitalization rate was two times higher for males (0.54 per 100,000) than females (0.23 per 100,000). The highest rates were found among infants less than 1 year of age (2.0 per 100,000) and children 1-4 years (2.9 per 100,000) (see Figure 9.5). The majority of drowning (95 percent) were caused by unintentional drowning (Figure 9.6). See Tables 35a-c located at the end of this section for more detailed information on the number and rate of unintentional drowning hospitalizations.

**Table 9.2 Unintentional Drowning Hospitalization Risk Profile**

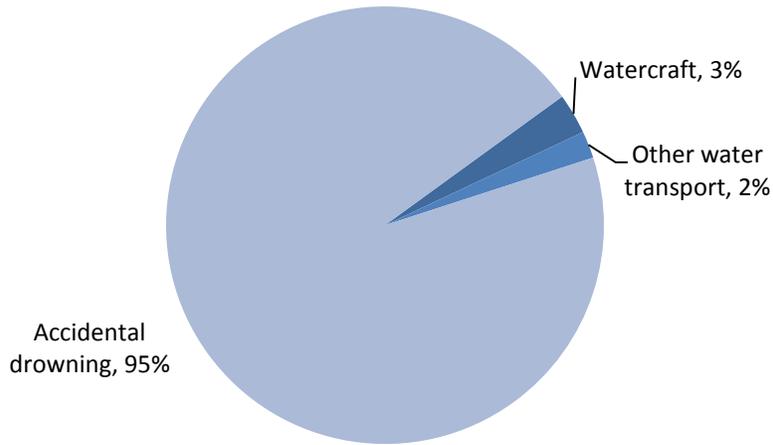
	At Risk Groups in 2002-2010
Overall	
Sex	Males
Age	<5 years

**Figure 9.5. Unintentional drowning hospitalization rates per 100,000 by age, Ohio, 2002-2010**



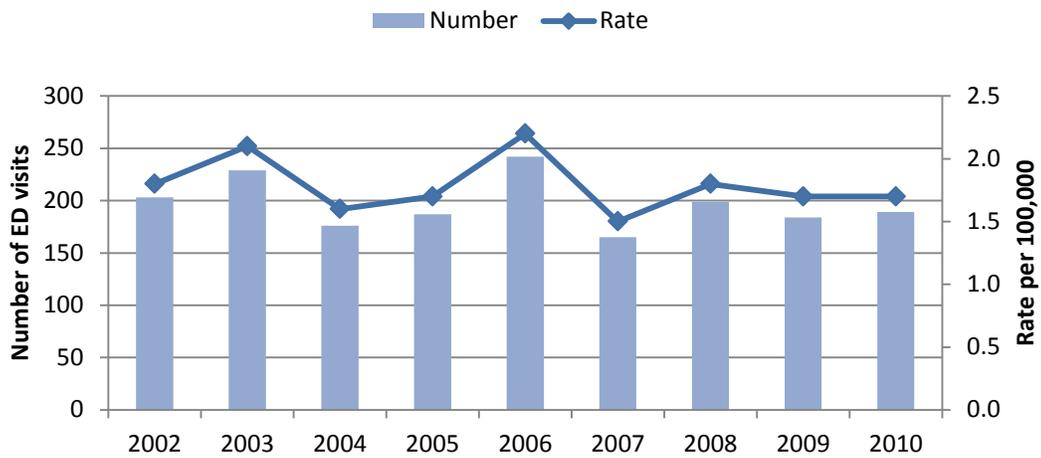
Source: Ohio Hospital Association  
\*Rate suppressed due to < 20 hospitalizations

**Figure 9.6. Distribution of hospitalizations resulting from unintentional drowning by cause, Ohio, 2002-2010**



Source: Ohio Hospital Association

**Figure 9.7. Number and age adjusted rate for unintentional drowning ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

One hundred eighty nine ED visits were associated with unintentional drowning in 2010. The ED visit rate was 1.7 per 100,000 (Figure 9.7). Males were more likely than females to visit an ED for a drowning. ED visits increased from birth through age 4 and then steadily decreased after age 5 (Figure 9.8). See Table 9.3 for an unintentional drowning ED visit risk profile. Unintentional drowning caused 92 percent of visits and water transport was associated with 8 percent of visits (Figure 9.9).

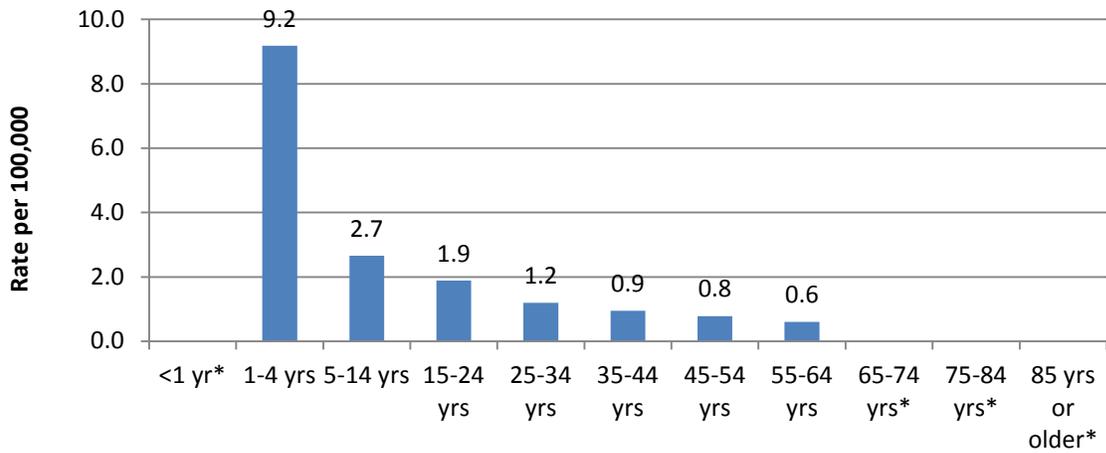
**Table 9.3 Unintentional Drowning ED Visit Risk Profile**

	2010 At Risk Groups	Trend since 2002
<b>Overall</b>		Did not change
<b>Sex</b>	Males	Males (-12%)
<b>Age</b>	1-4 years	1-4 years (+37%)

**TRENDS:**

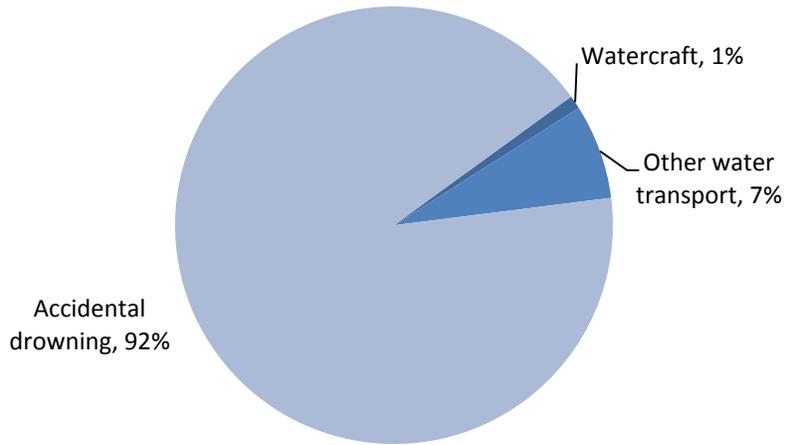
ED visits resulting from unintentional drowning fluctuated throughout the study period with a high of 2.2 per 100,000 in 2006 and a low of 1.5 per 100,000 in 2007. Males and children ages 1-4 years were highest risk groups throughout the study period. The distribution in the causes of drowning related ED visits did not change over time. See Tables 36a-c located at the end of this section for more detailed information on the number and rate of unintentional drowning ED visits.

Figure 9.8. Unintentional drowning ED visit rates per 100,000 by age, Ohio, 2002-2010



Source: Ohio Hospital Association  
\*Rate suppressed due to < 20 hospitalizations

Figure 9.9. Distribution of ED visits resulting from unintentional drowning by cause, Ohio, 2010



Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 34a. Number of deaths resulting from unintentional drowning, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	103	101	98	92	88	96	90	100	108	83	93
<b>Sex</b>											
Males	80	72	84	69	68	72	68	77	81	68	69
Females	23	29	14	23	20	24	22	23	27	15	24
<b>Age</b>											
< 1 yr	6			7			7			<5	
1-4 yrs	24			42			38			39	
5-14 yrs	34			33			21			31	
15-24 yrs	38			59			63			45	
25-34 yrs	23			33			27			30	
35-44 yrs	28			26			33			31	
45-54 yrs	24			30			43			42	
55-64 yrs	8			23			17			28	
65-74 yrs	5			16			14			13	
75-84 yrs	9			<5			14			17	
85 or older	5			6			9			5	
<b>Race and ethnicity</b>											
White‡	153			216			230			214	
Black‡	47			46			45			56	
Hispanic	<5			8			8			9	
Other‡	0			6			<5			5	

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 34b. Death rates per 100,000 resulting from unintentional drowning, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	0.91	0.90	0.86	0.81	0.78	0.84	0.79	0.87	0.94	0.71	0.83	<-0.1 (NL)
<b>Sex†</b>												
Males	1.43	1.31	1.51	1.24	1.20	1.31	1.21	1.36	1.45	1.18	1.25	<-0.1 (NL)
Females	0.40	0.50	*	0.40	0.34	0.41	0.38	0.39	0.47	*	0.42	<0.1 (NL)
<b>Age</b>												
< 1 yr	*			*			*			*		*
1-4 yrs	1.99			2.33			2.14			2.21		<0.1 (NL)
5-14 yrs	1.04			0.69			0.45			0.69		<-0.1 (NL)
15-24 yrs	1.22			1.24			1.33			0.95		<-0.1 (NL)
25-34 yrs	0.77			0.74			0.61			0.69		<-0.1 (NL)
35-44 yrs	0.78			0.51			0.68			0.68		<-0.1 (NL)
45-54 yrs	0.75			0.60			0.83			0.80		<0.1 (NL)
55-64 yrs	0.39			0.68			0.45			0.67		<0.1 (NL)
65-74 yrs	*			*			*			*		*
75-84 yrs	*			*			*			*		*
85 or older	*			*			*			*		*
<b>Race and ethnicity†</b>												
White‡	0.81			0.76			0.80			0.75		<-0.1 (NL)
Black‡	1.58			1.06			0.99			1.23		<-0.1 (NL)
Hispanic	*			*			*			*		*
Other‡	*			*			*			*		*

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 34c. Number of deaths resulting from unintentional drowning, by location and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Bath tub	13	14	7	11	9	7	17	15	18	11	5	*	*
Swimming pool	19	14	14	8	10	22	11	9	17	15	16	17%	*
Natural body of water	24	28	30	31	26	39	39	44	47	39	44	47%	2.1
Other	7	10	10	11	8	<5	<5	11	<5	<5	<5	*	*
Unspecified	40	35	37	31	35	27	22	21	24	16	25	27%	-2.0

\*Suppressed due to fewer than 20 deaths.

Source: Ohio Department of Health, Office of Vital Statistics

**Table 35a. Number of hospitalizations resulting from unintentional drowning by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	53	37	37	41	40	50	51	35	36
<b>Sex</b>									
Males	40	27	23	29	30	33	36	24	26
Females	13	10	14	12	10	17	15	11	10
<b>Age</b>									
< 1 yr					27				
1-4 yrs					152				
5-14 yrs					86				
15-24 yrs					43				
25-34 yrs					13				
35-44 yrs					21				
45-54 yrs					15				
55-64 yrs					8				
65-74 yrs					<5				
75-84 yrs					5				
85 or older					6				

Source: Ohio Hospital Association

**Table 35b. Hospitalization rates per 100,000 resulting from unintentional drowning, Ohio, 2002-2010**

	<b>2002-2010</b>
Overall†	0.39
<b>Sex†</b>	
Males	0.54
Females	0.23
<b>Age</b>	
< 1 yr	2.03
1-4 yrs	2.85
5-14 yrs	0.62
15-24 yrs	0.30
25-34 yrs	*
35-44 yrs	0.14
45-54 yrs	*
55-64 yrs	*
65-74 yrs	*
75-84 yrs	*
85 or older	*

\*Rates suppressed due to less than 20 hospitalizations

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 35c. Number and percentage of hospitalizations resulting from unintentional drowning by type, Ohio, 2002-2010**

	<b>2002-2010</b>	<b>2002-2010</b>
	<b>Number</b>	<b>Percent</b>
Caused by watercraft	10	3%
Other water transport	8	2%
Unintentional drowning	362	95%

Source: Ohio Hospital Association

**Table 36a. Number of ED visits resulting from unintentional drowning by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	203	229	176	187	241	165	199	184	189
<b>Sex</b>									
Males	134	156	105	123	176	101	121	119	0
Females	69	73	71	64	65	64	78	65	0
<b>Age</b>									
< 1 yr	9	7	5	7	5	6	<5	5	11
1-4 yrs	30	41	53	55	47	44	59	52	51
5-14 yrs	52	51	49	32	76	36	44	40	36
15-24 yrs	47	58	24	32	68	38	29	29	31
25-34 yrs	20	26	12	15	13	14	16	19	17
35-44 yrs	24	27	14	16	10	9	13	16	14
45-54 yrs	14	7	7	16	8	11	17	8	16
55-64 yrs	<5	<5	<5	7	9	<5	9	12	<5
65-74 yrs	0	<5	7	<5	<5	<5	5	<5	<5
75-84 yrs	<5	<5	<5	<5	0	<5	<5	0	<5
85 or older	<5	<5	0	<5	<5	<5	<5	0	<5

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 36b. ED visit rates per 100,000 resulting from unintentional drowning by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.8	2.1	1.6	1.7	2.2	1.5	1.8	1.7	1.7	<-0.1 (NL)
<b>Sex†</b>										
Males	2.5	2.8	1.9	2.2	3.2	1.8	2.2	2.2	2.1	-0.1 (NL)
Females	1.2	1.3	1.3	1.2	1.2	1.2	1.4	1.2	1.4	<0.1 (NL)
<b>Age</b>										
< 1 yr		4.7			*			*		*
1-4 yrs		6.9			8.3			9.2		0.4
5-14 yrs		3.2			3.1			2.7		-0.1
15-24 yrs		2.7			2.9			1.9		-0.1
25-34 yrs		1.3			1.0			1.2		<-0.1 (NL)
35-44 yrs		1.3			0.7			0.9		-0.1 (NL)
45-54 yrs		0.6			0.7			0.8		<0.1 (NL)
55-64 yrs		*			*			0.6		*
65-74 yrs		*			*			*		*
75-84 yrs		*			*			*		*
85 or older		*			*			*		*

\*Rates are suppressed due to less than 20 ED visits †Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 36c. Number of ED visit rates resulting from unintentional drownings by type and year, Ohio, 2002-2010**

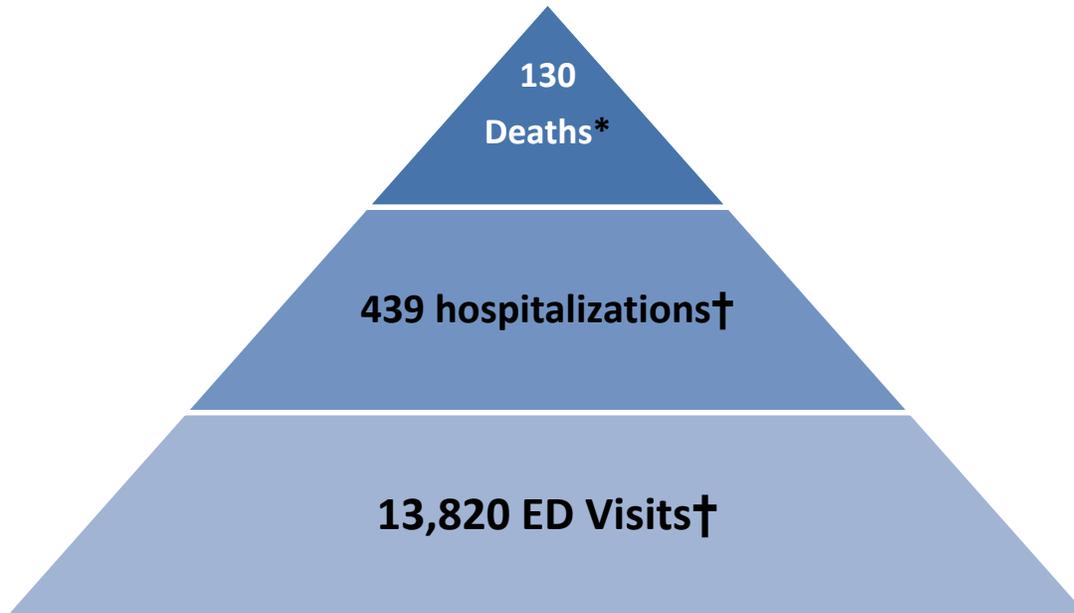
	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Caused by watercraft	7	7	<5	<5	0	<5	<5	5	<5	1%	*
Other water transport	21	18	17	12	8	11	12	13	13	7%	*
Unintentional drowning	175	204	156	172	233	151	184	166	174	92%	-1 (NL)

\*Rates are suppressed due to less than 20 ED visits

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

## SECTION 3.8: BURNS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

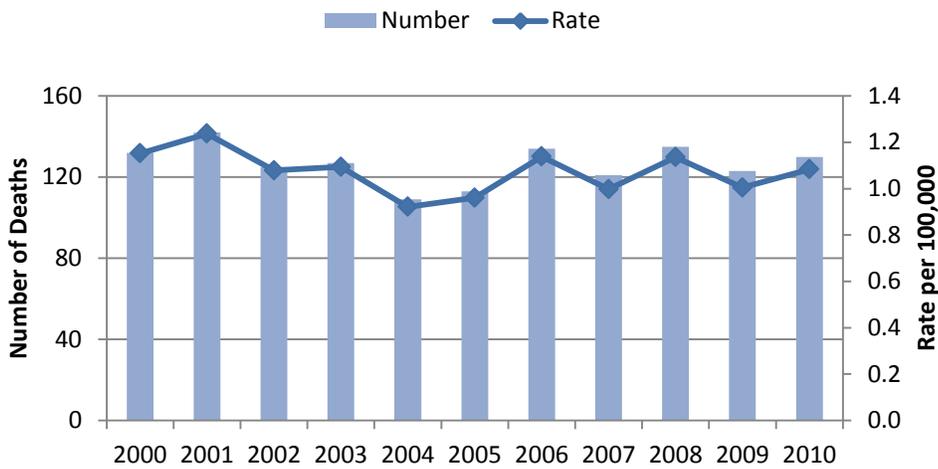
#### Patterns:

- Highest rates of fatal burns were found among ages 85 or older while the highest rates of non-fatal burns were found among children less than 5 years of age.
- Fatal and non-fatal burn rates were higher among males than females.
- Most fatal burns were caused by an uncontrolled fire while touching hot objects was the most common cause of non-fatal burns.

#### Trends:

- Death rates did not follow a consistent linear pattern in 2000-2010.
- Hospitalization rates have decreased 43 percent while ED visit rates increased 17 percent since 2002.
- Largest increase in fatal burns was found among adults ages 75-84 and largest increase in ED visits was found among children less than 5 years of age.
- Most fatal burns were caused by an uncontrolled fire and touching hot objects were most common cause of non-fatal burns throughout the study period.

**Figure 10.1. Number and age adjusted rate for unintentional burn deaths by year, Ohio, 2002-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**DEATHS:**

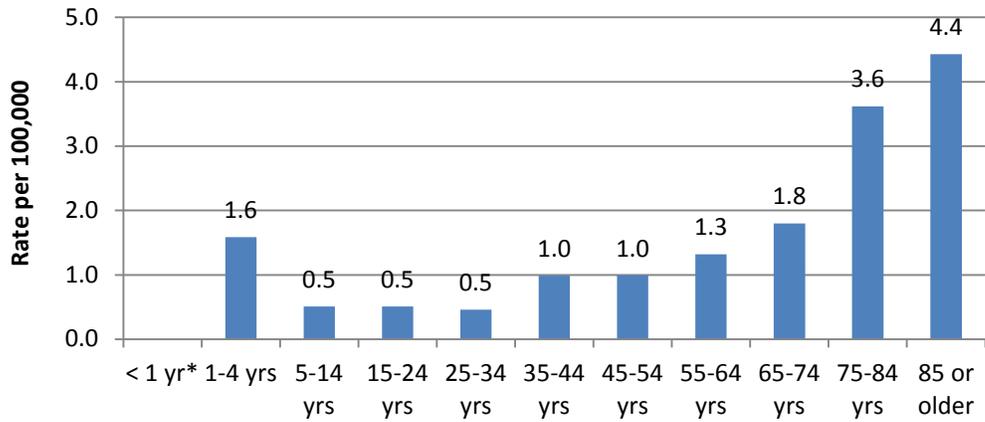
In 2010, 130 deaths resulted from unintentional burns. The burn fatality rate was 1.1 per 100,000 (Figure 10.1). Burn fatality rates were higher among males (1.3 per 100,000) than females (0.9 per 100,000). Rates decreased with age among ages 0-24 and increased with age among ages 25 or older. The highest death rates were found among ages 85 or older (Figure 10.2). The burn death rate was 1.2 per 100,000 for whites while rates were suppressed for other race and ethnic groups due to less than 20 deaths. Death rates were generally higher among blacks than whites in previous years when the number of deaths exceeded 20 for blacks. Nearly 84 percent of fatal burns were caused by an uncontrolled fire (Figure 10.3). See Table 10.1 for an unintentional burn death risk profile.

Table 10.1 Unintentional Burn Death Risk Profile		
	2010 At Risk Groups	Annual trend since 2000
Overall		Inconsistent trend
Sex	Males	Inconsistent trends
Age	85 or older	75-84 (largest increase)
Race and ethnicity	Blacks	Inconsistent trends

**TRENDS:**

From 2000 to 2010, the unintentional burn death rate did not follow a consistent linear trend. Rates varied from a high of 1.24 per 100,000 in 2001 to a low of 0.92 per 100,000 in 2004. Slight increases were found among ages 75-84 (+0.1 per 100,000 per year) and ages 55-64 (+0.03 per 100,000 per year) while a slight decrease was found among children ages 1-4 years (-0.2 per 100,000 per year). Rates did not follow a consistent linear trend among males or females nor by race or ethnic group. See Tables 37a-c located at the end of this section for more detailed information on the number and rate of unintentional burn deaths in Ohio.

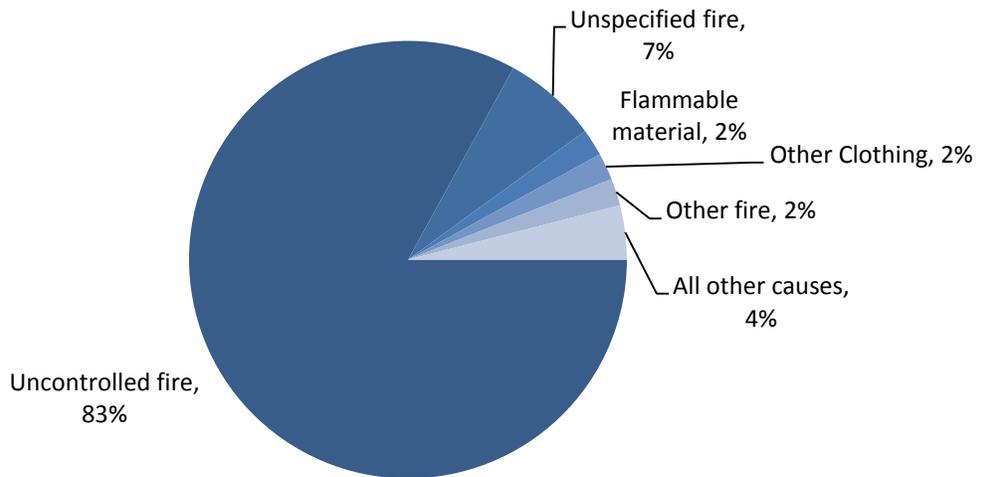
**Figure 10.2. Rate of unintentional burn death rate by age group, Ohio, 2008-2010**



Source: Ohio Department of Health, Vital Statistics

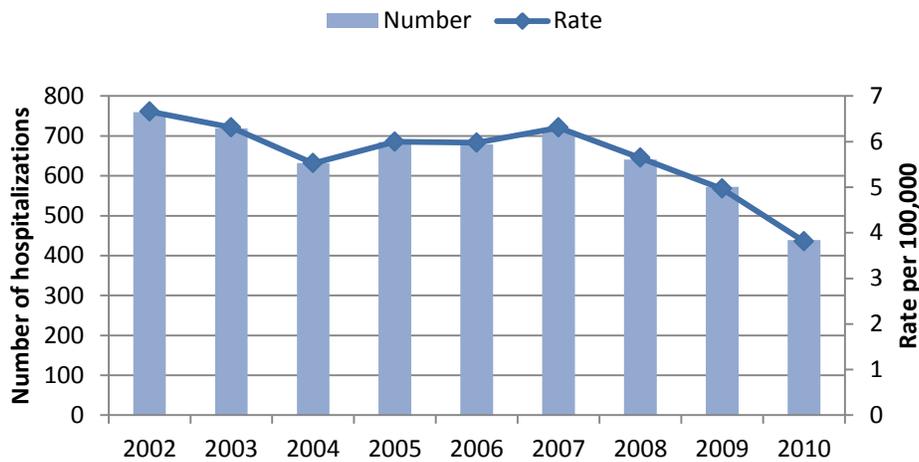
\*Rates suppressed due to small cell sizes

**Figure 10.3. Distribution of deaths resulting from unintentional burns by cause, Ohio, 2010**



Source: Ohio Department of Health, Vital Statistics

**Figure 10.4. Number and age adjusted rate for unintentional burn hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

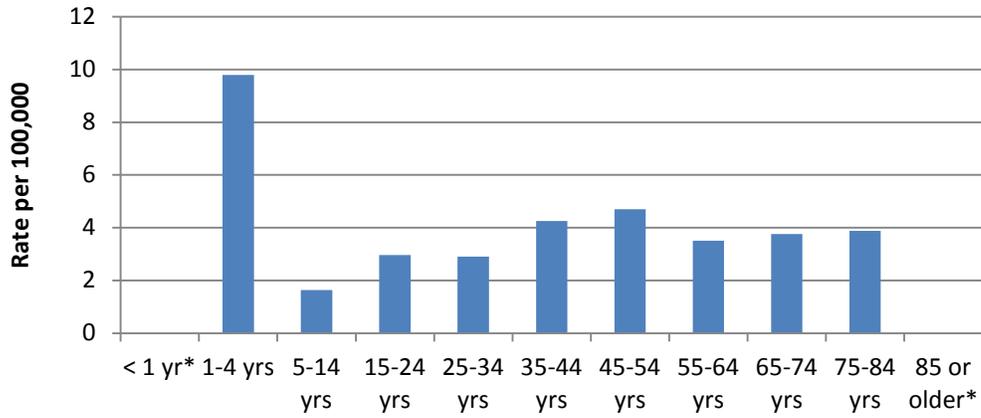
In 2010, 439 hospitalizations resulted from unintentional burns. The burn hospitalization rate was 3.8 per 100,000 (Figure 10.4). The hospitalization rate was higher for males. The highest rates were found among children 1-4 years (see Figure 10.5). The majority of burns were caused by touching hot objects (54 percent) followed by ignition of materials (18 percent) and conflagration (16 percent) (Figure 10.6). See Table 10.2 for an unintentional burn hospitalization risk profile.

Table 10.2 Unintentional Burn Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
<b>Overall</b>		-43%
<b>Sex</b>	Males	Females (Inconsistent)
<b>Age</b>	1-4	1-14 (Inconsistent)

**TRENDS:**

Hospitalizations resulting from unintentional burns decreased 43 percent from 6.7 per 100,000 in 2002 to 3.8 per 100,000 in 2010. Rates decreased by an average of -0.2 per 100,000 per year. Rates among males decreased on average by -0.4 per 100,000 per year while rates among females did not follow a consistent trend. Hospitalization rates decreased among ages 15-84 with the largest average annual decrease found among adults ages 75-84 (-0.6 per 100,000). Rates among children ages 1-14 did not follow a consistent trend and cell sizes were too small to complete a trend analysis of infants and adults ages 85 or older. Burns caused by ignition of materials decreased by an average of 10 hospitalizations per year while the number of hospitalizations resulting from the other leading causes of burns did not follow a consistent trend. See Tables 38a-c located at the end of this section for more detailed information on the number and rate of unintentional burn hospitalizations.

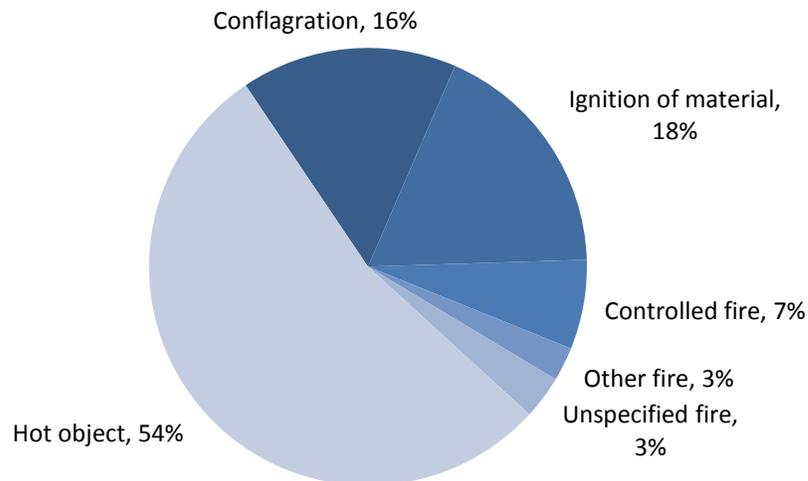
**Figure 10.5. Hospitalization rates for unintentional burns by age, Ohio, 2010**



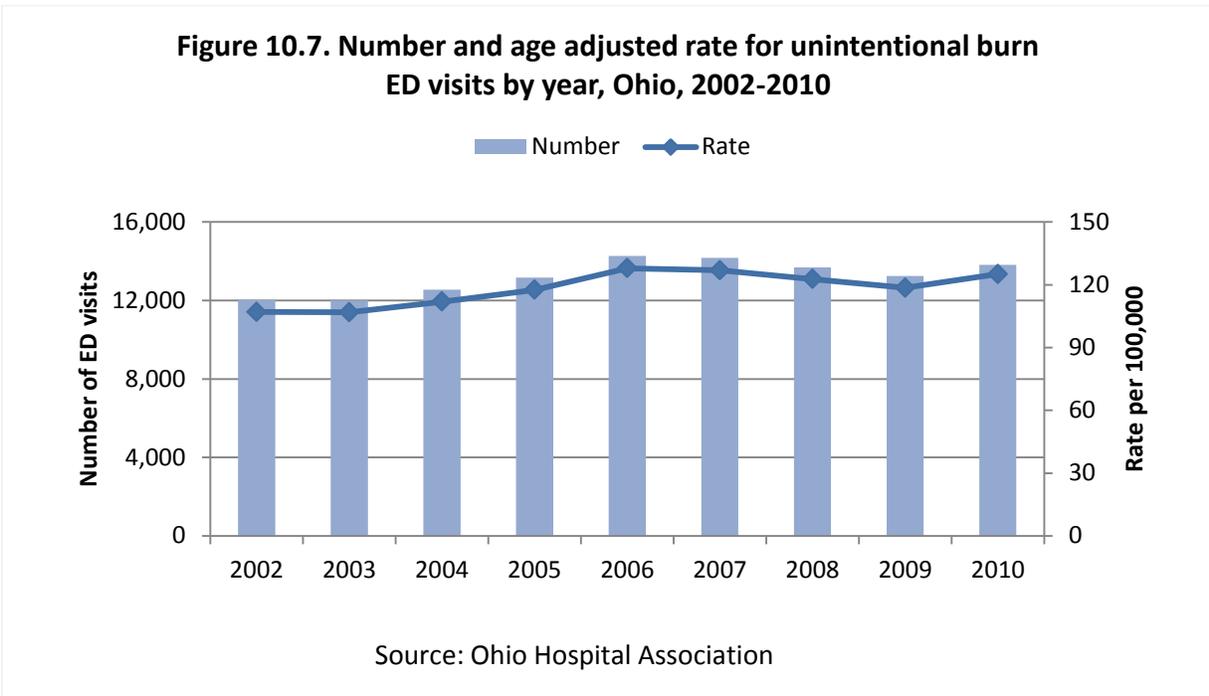
Source: Ohio Hospital Association

\*Rate suppressed due to < 20 hospitalizations

**Figure 10.6. Distribution of hospitalizations resulting from unintentional burns by cause, Ohio, 2010**



Source: Ohio Hospital Association



**EMERGENCY DEPARTMENT VISITS:**

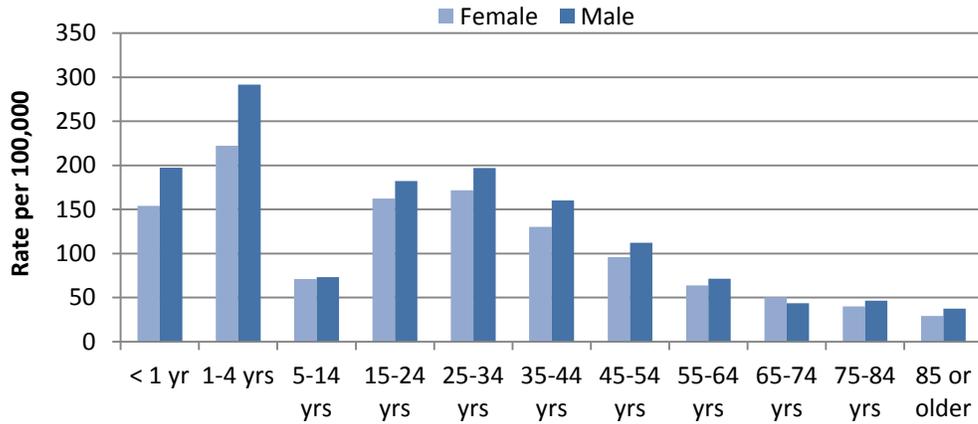
Nearly 14,000 ED visits were associated with unintentional burns in 2010. The ED visit rate was 125 per 100,000 (Figure 10.7). Males were more likely than females to visit the ED for a burn which was consistent throughout the lifespan. For both males and females, the highest rates of ED visits were found among birth through age 4 and ages 15-34 (Figure 10.8). Touching hot objects caused 78 percent of ED visits resulting from burns (Figure 10.9). See Table 10.3 for an unintentional burn ED visit risk profile.

Table 10.3 Unintentional Burn ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		+17%
Sex	Males	Females (largest increase)
Age	1-4 yrs	1-4 yrs (largest increase)

**TRENDS:**

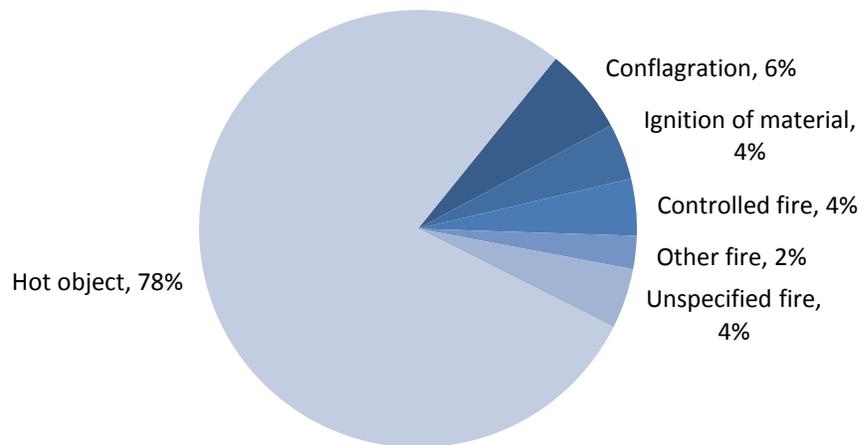
Between 2002 and 2010, ED visit rates resulting from unintentional burns increased 17 percent from 107 per 100,000 in 2002 to 125 per 100,000 in 2010. Rates increased by an average of 2.3 per 100,000 per year. An increase was found among females (+2.6 per 100,000 per year) while rates among males did not follow a consistent trend. An increase was found among most age groups with largest average annual increases occurring among children ages 1-4 (+6.4 per 100,000 per year) and infants less than 1 year (5.7 per 100,000 per year). ED visits resulting from burns caused by touching hot objects increased by an average of 180 ED visits per year and burns caused by controlled fires increased by an average of 24 per year. ED visits resulting from other types of fires decreased by an average of 13 visits per year. Other leading causes of burns did not follow a consistent trend. See Tables 39a-c located at the end of this section for more detailed information about unintentional burn ED visits.

**Figure 10.8. ED visit rates for unintentional burns by age and sex, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 10.9. Distribution of ED visits resulting from unintentional burns by cause, Ohio, 2010**



Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 37a. Number of deaths resulting from unintentional fire or burns, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	132	142	125	127	109	113	134	121	135	123	130
<b>Sex</b>											
Males	79	77	75	72	66	62	72	68	75	74	71
Females	53	65	50	55	43	51	62	53	60	49	59
<b>Age</b>											
< 1 yr	<5			6			<5			7	
1-4 yrs	35			38			21			28	
5-14 yrs	24			31			37			23	
15-24 yrs	16			29			26			24	
25-34 yrs	22			34			18			20	
35-44 yrs	34			26			40			45	
45-54 yrs	39			49			48			52	
55-64 yrs	21			43			46			55	
65-74 yrs	31			34			43			45	
75-84 yrs	34			48			58			59	
85 or older	15			23			28			30	
<b>Race and ethnicity</b>											
White‡	107	122	100	101	86	83	111	91	109	90	119
Black‡	23	19	22	26	21	29	21	26	19	32	10
Hispanic	0	<5	<5	0	<5	<5	<5	<5	7	<5	<5
Other‡	<5	0	<5	0	0	0	0	0	0	0	0

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 37b. Death rates per 100,000 resulting from unintentional fire or burns, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	1.15	1.24	1.08	1.09	0.92	0.96	1.14	1.00	1.14	1.00	1.08	<-0.1 (NL)
<b>Sex†</b>												
Males	1.49	1.44	1.43	1.36	1.21	1.14	1.33	1.22	1.34	1.35	1.28	<-0.1 (NL)
Females	0.89	1.06	0.82	0.89	0.71	0.82	0.99	0.81	0.95	0.75	0.91	<-0.1 (NL)
<b>Age</b>												
< 1 yr	*			*			*			*		*
1-4 yrs	2.91			2.11			1.18			1.59		-0.17
5-14 yrs	0.73			0.65			0.80			0.51		<-0.1 (NL)
15-24 yrs	*			0.61			0.55			0.51		*
25-34 yrs	0.73			0.77			*			0.46		*
35-44 yrs	0.95			0.51			0.82			0.99		<0.1 (NL)
45-54 yrs	1.22			0.98			0.92			0.99		<-0.1 (NL)
55-64 yrs	1.03			1.27			1.22			1.32		0.03
65-74 yrs	1.98			1.47			1.84			1.80		<-0.1 (NL)
75-84 yrs	3.12			2.87			3.47			3.62		0.08
85 or older	*			4.05			4.51			4.43		*
<b>Race and ethnicity†</b>												
White‡	1.10	1.24	1.01	1.02	0.84	0.81	1.11	0.87	1.07	0.85	1.20	NL
Black‡	2.02	*	1.70	1.90	1.49	2.15	1.57	1.95	*	2.38	*	*
Hispanic	*	*	*	*	*	*	*	*	*	*	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 37c. Number of death resulting from unintentional fire or burns, by cause and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 00-10	Trend (per yr)
Uncontrolled fire	115	124	100	110	90	97	116	97	114	99	105	83.9%	-1 (NL)
Controlled fire	<5	0	0	0	<5	0	<5	<5	5	<5	<5	1.4%	*
Flammable material	<5	0	<5	<5	0	<5	5	<5	<5	<5	5	1.7%	*
Nightwear	0	0	0	0	0	0	0	0	0	0	<5	0.1%	*
Other clothing	0	<5	<5	<5	0	<5	0	<5	<5	0	<5	1.5%	*
Other fire	0	<5	0	<5	<5	<5	<5	<5	<5	<5	<5	1.5%	*
Unspecified fire	2	10	15	8	10	7	8	12	9	11	9	7.3%	*
Hot water	0	<5	<5	<5	0	<5	0	<5	<5	<5	0	0.6%	*
Other hot fluids	0	<5	0	<5	0	0	0	0	<5	<5	0	0.3%	*
Steam or hot vapors	0	0	0	0	0	0	0	0	0	<5	0	0.1%	*
Hot air or gases	0	0	0	0	0	0	0	0	0	0	<5	0.1%	*
Household appliances	0	0	0	0	0	0	<5	0	0	0	0	0.1%	*
Hot heating appliances	0	0	0	0	<5	<5	0	0	<5	<5	0	0.4%	*
Other hot metals	0	<5	0	0	0	0	<5	0	0	0	0	0.1%	*
Unspecified substance	<5	0	<5	0	0	0	0	0	0	0	0	0.1%	*

\*Analysis suppressed due to less than 20 deaths

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 38a. Number of hospitalizations resulting from unintentional burns by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	760	719	632	685	679	714	641	572	439
<b>Sex</b>									
Males	514	461	451	452	451	485	418	349	276
Females	246	258	181	233	228	229	223	223	163
<b>Age</b>									
< 1 yr	9	15	15	23	31	27	31	29	11
1-4 yrs	86	84	65	75	112	110	129	101	57
5-14 yrs	53	47	43	44	62	71	72	52	25
15-24 yrs	99	87	83	87	82	88	63	60	47
25-34 yrs	105	88	73	85	87	79	73	60	41
35-44 yrs	113	126	103	109	68	101	53	49	63
45-54 yrs	109	123	95	101	90	96	85	85	82
55-64 yrs	67	47	57	66	52	65	48	47	51
65-74 yrs	54	36	42	39	39	37	44	34	32
75-84 yrs	47	49	42	40	38	29	31	31	21
85 or older	18	17	14	16	18	11	12	24	9

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 38b. Hospitalization rates per 100,000 resulting from unintentional burns by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	6.7	6.3	5.5	6.0	6.0	6.3	5.6	5.0	3.8	-0.2
<b>Sex†</b>										
Males	9.3	8.3	8.2	8.1	8.1	8.7	7.5	6.2	4.9	-0.4
Females	4.1	4.3	3.0	3.9	3.9	3.9	3.9	3.8	2.7	-0.1 (NL)
<b>Age</b>										
< 1 yr	*	*	*	15.7	20.9	17.8	20.3	19.6	*	*
1-4 yrs	14.3	14.0	10.9	12.6	19.1	18.7	21.8	17.1	9.8	0.3 (NL)
5-14 yrs	3.3	2.9	2.7	2.8	4.0	4.7	4.8	3.5	1.6	<0.1 (NL)
15-24 yrs	6.3	5.5	5.2	5.5	5.2	5.6	4.0	3.8	3.0	-0.3
25-34 yrs	7.1	6.0	5.0	5.8	6.0	5.4	5.0	4.1	2.9	-0.4
35-44 yrs	6.5	7.4	6.1	6.6	4.2	6.3	3.4	3.2	4.3	-0.5
45-54 yrs	6.6	7.4	5.6	5.9	5.2	5.5	4.9	4.8	4.7	-0.3
55-64 yrs	6.2	4.2	4.9	5.4	4.1	5.0	3.6	3.4	3.5	-0.3
65-74 yrs	7.0	4.7	5.5	5.1	5.1	4.7	5.5	4.1	3.8	-0.3
75-84 yrs	8.5	8.8	7.6	7.2	6.9	5.3	5.8	5.7	3.9	-0.6
85 or older	*	*	*	*	*	*	*	10.6	*	*

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 38c. Number of hospitalizations resulting from unintentional burns by cause and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Conflagration	112	120	83	105	107	116	74	96	70	15.9%	-4 (NL)
Ignition of material	156	166	180	163	128	140	134	100	79	18.0%	-10.35
Controlled fire	60	43	28	36	34	58	43	31	29	6.6%	-2 (NL)
Other fire	26	25	17	20	20	21	20	14	11	*	*
Unspecified fire	28	20	22	18	12	24	31	19	14	*	*
Hot substance or object	378	345	302	323	378	356	339	312	236	53.8%	-9 (NL)

\*Rates suppressed due to less than 20 hospitalizations.

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 39a. Number of ED visits resulting from unintentional burns by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	12,029	12,008	12,553	13,171	14,268	14,175	13,690	13,248	13,820
<b>Sex</b>									
Males	6,530	6,560	6,997	7,102	7,841	7,767	7,415	6,966	7,363
Females	5,499	5,448	5,556	6,069	6,427	6,408	6,275	6,282	6,456
<b>Age</b>									
< 1 yr	217	200	206	260	257	275	294	257	245
1-4 yrs	1,333	1,266	1,281	1,315	1,554	1,513	1,499	1,507	1,499
5-14 yrs	952	996	1,026	1,068	1,183	1,249	1,233	1,162	1,099
15-24 yrs	2,679	2,607	2,755	2,867	3,073	2,995	2,721	2,673	2,738
25-34 yrs	2,329	2,219	2,379	2,398	2,664	2,557	2,578	2,460	2,597
35-44 yrs	2,016	2,084	2,159	2,251	2,339	2,221	2,027	1,896	2,146
45-54 yrs	1,347	1,445	1,484	1,643	1,771	1,877	1,808	1,754	1,809
55-64 yrs	630	657	687	759	807	846	865	865	980
65-74 yrs	262	269	322	315	347	358	385	386	403
75-84 yrs	202	204	203	224	206	209	209	199	231
85 or older	62	61	51	71	67	75	71	89	73

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 39b. ED visit rates per 100,000 resulting from unintentional burns by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	107	107	112	118	128	127	123	119	125	2.3
<b>Sex†</b>										
Males	117	98	126	128	141	140	134	125	134	3.0 (NL)
Females	97	96	98	107	114	114	112	112	116	2.6
<b>Age</b>										
< 1 yr	147	136	138	177	173	181	193	174	176	5.7
1-4 yrs	222	212	215	221	265	257	254	255	258	6.4
5-14 yrs	59	62	65	69	77	82	82	78	72	2.5
15-24 yrs	169	163	173	180	194	190	173	171	173	0.8 (NL)
25-34 yrs	158	151	163	165	183	175	176	166	184	3.1
35-44 yrs	115	122	129	137	144	139	130	125	145	2.2 (NL)
45-54 yrs	82	86	87	96	102	107	103	100	104	2.9
55-64 yrs	58	58	59	63	64	65	65	62	67	1.1
65-74 yrs	34	35	42	41	45	46	48	46	47	1.7
75-84 yrs	37	37	37	40	37	38	39	37	43	0.5 (NL)
85 or older	33	31	25	34	31	34	31	39	32	0.5 (NL)

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

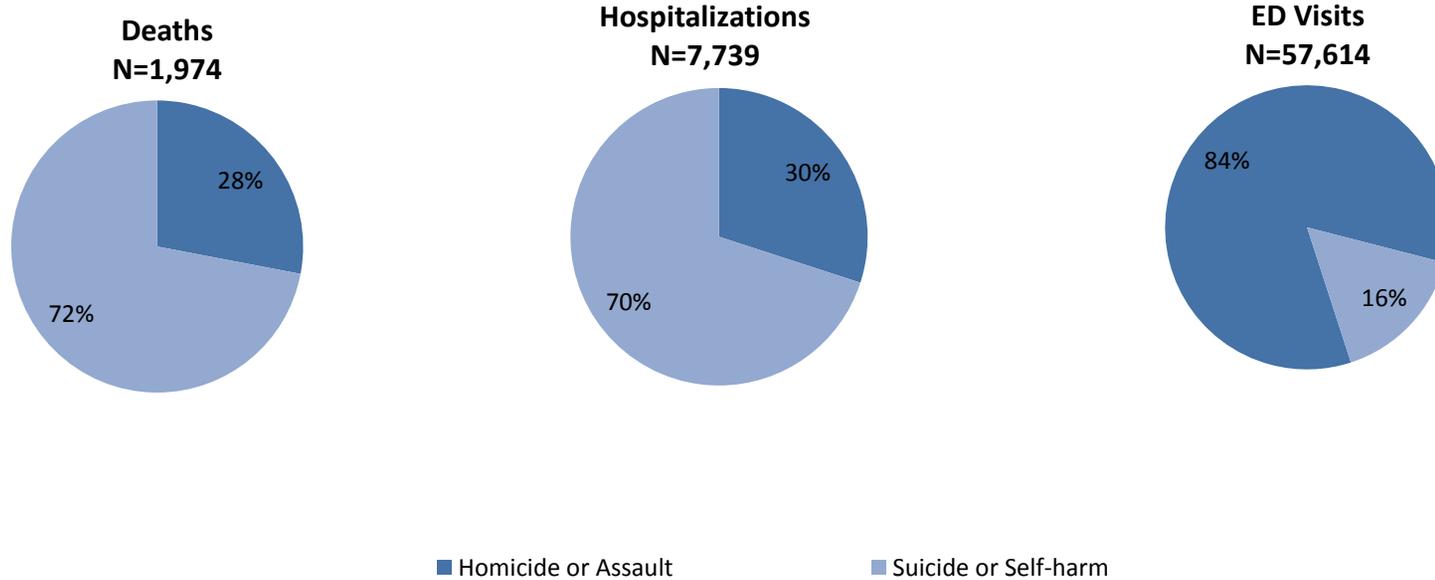
**Table 39c. Number of ED visit rates resulting from unintentional burns by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Conflagration	811	799	952	932	872	965	907	876	876	6.3%	7 (NL)
Ignition of material	426	506	540	520	522	545	581	485	573	4.1%	11 (NL)
Controlled fire	395	449	460	517	536	578	522	615	579	4.2%	24
Other fire	443	355	415	391	358	396	348	279	338	2.4%	-13
Unspecified fire	473	533	539	609	645	651	548	529	615	4.5%	10 (NL)
Hot substance or object	9,581	9,367	9,647	10,204	11,336	11,040	10,478	10,466	10,826	78.3%	180

Source: Ohio Hospital Association

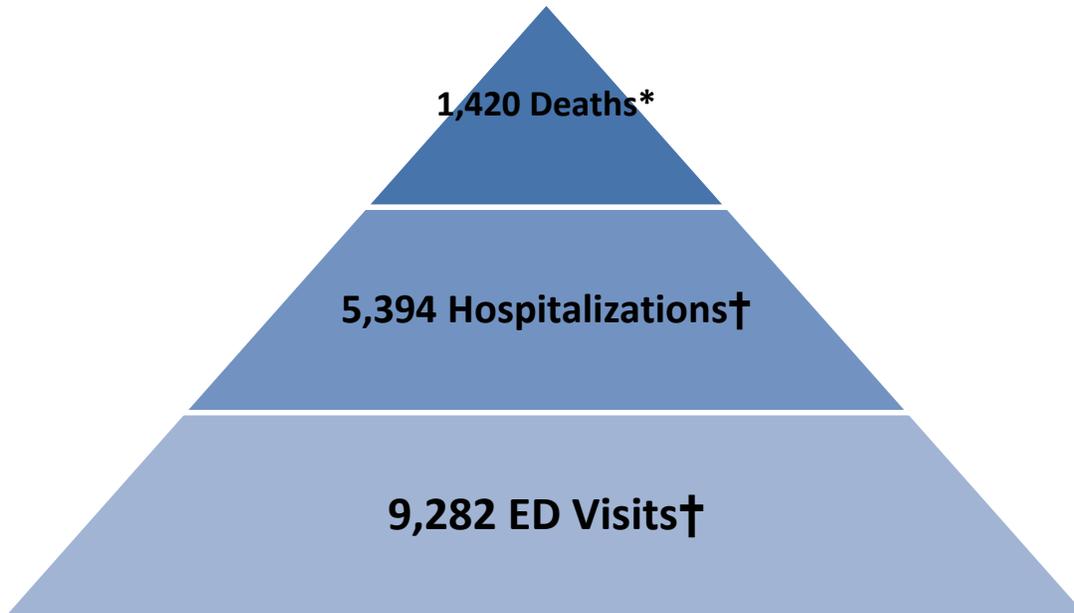
NL: Interpret with caution because trend does not follow linear pattern

## SECTION 4: INTENTIONAL INJURIES



Intentional injuries were responsible for nearly 2,000 deaths, 7,700 hospitalizations, and 58,000 ED visits in 2010. The distribution of intentional injuries varies by severity. Approximately 3 out of every 4 intentional injury deaths and hospitalizations were associated with suicide or self-harm behaviors while 8 in 10 intentional injury ED visits were associated with assaults.

## SECTION 4.1: SUICIDES AND SELF-HARM



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

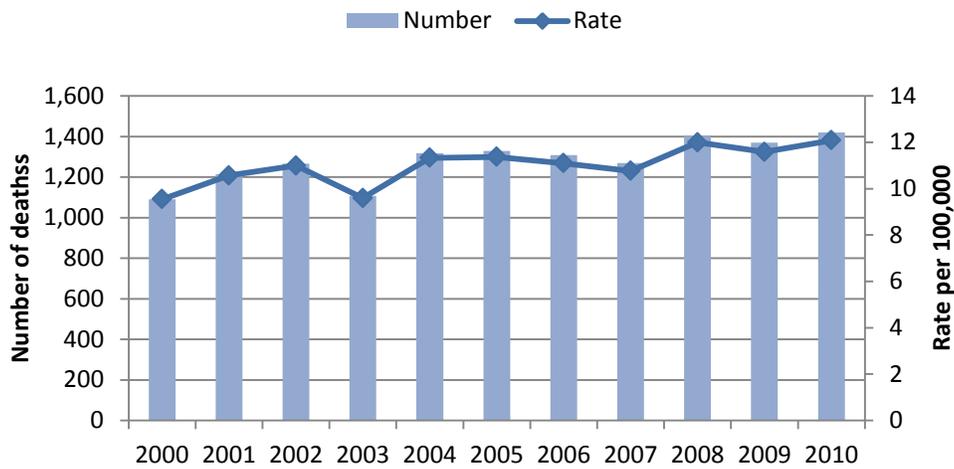
#### Patterns:

- Suicide rates were 4 times higher among males while females were more likely to experience a non-fatal self-harm injury than males.
- Highest rates of suicide were found among adults ages 45-54.
- Highest rates of non-fatal self-harm related injuries were among ages 15-44.
- Most suicides involved the use of a firearm and self-harm related injuries were caused by poisoning.

#### Trends:

- Suicide rates have increased 27 percent since 2000.
- Hospitalization and ED visit rates increased in 2002-2007 and then leveled off in 2007-2010.
- Most suicides involved the use of a firearm while poisoning was associated with most self-harm hospitalizations and ED visits throughout the study period.

**Figure 11.1. Number and age adjusted rate for suicides by year, Ohio, 2002-2010**



Source: Ohio Department of Health

**DEATHS:**

In 2010, 1,420 deaths resulted from a suicide in Ohio. The suicide rate was 12.1 per 100,000 (see Figure 11.1). Suicide rates were 4 times higher among males (20 per 100,000) compared to females (5 per 100,000). Rates among males increased among ages 15-34, leveled off between ages 35-84 and then increased among ages 85 or older. Among females, the highest rates were found among ages 45-54 (see Figure 11.2). See Table 11.1 for a suicide risk profile.

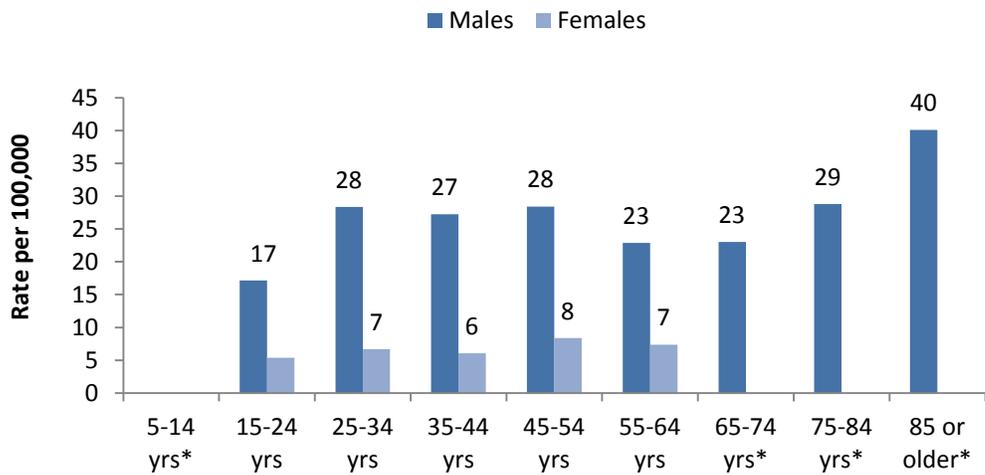
Approximately one-half of suicides resulted from firearms. Other leading mechanisms included hanging (26 percent) and poisoning (17 percent).

	2010 At Risk Groups	Annual trend since 2000
Overall		+27%
Sex	Males	Females (largest increase)
Age	45-54	45-54 (largest increase)
Race and ethnicity	Whites	Whites (largest increase)

**TRENDS:**

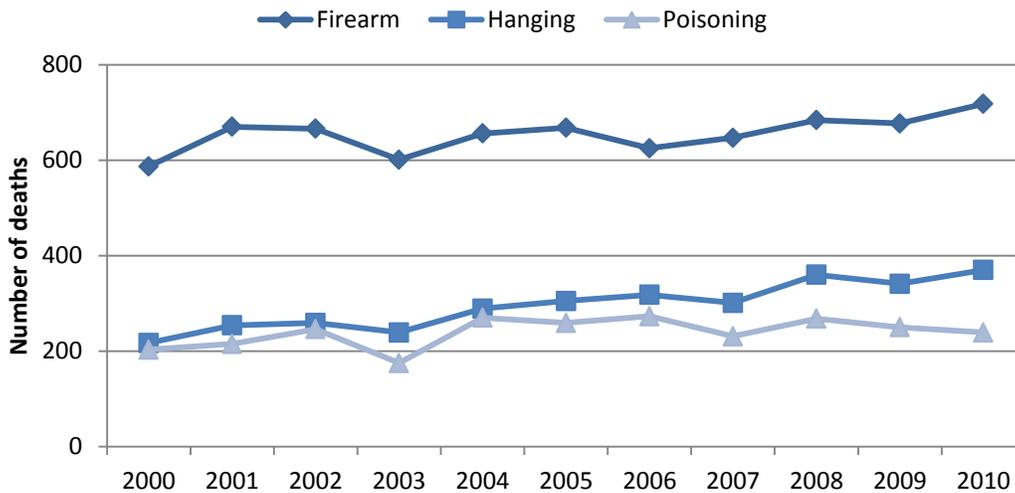
The suicide rate increased 27 percent from 9.5 per 100,000 in 2000 to 12.1 per 100,000 in 2010 (Figure 11.1). The average annual increase was 0.2 per 100,000 per year. Suicide rates increased among females (0.2 per 100,000 per year) while rates among males did not follow a consistent trend. Rates increased among adults ages 45-64 while rates decreased among adults 75-84. Rates did not follow a consistent trend among other age groups. Suicide rates increased among whites (0.3 per 100,000 per year) while rates did not follow a consistent trend among blacks. The number of suicides resulting from hanging increased by an average of 14 deaths per year while the number of suicides resulting from other mechanisms did not follow a consistent trend (Figure 11.3). See Tables 40a-c located at the end of this section for more detailed information on the number and rate of suicides in Ohio.

Figure 11.2. Suicide rates by sex and age group, Ohio, 2010



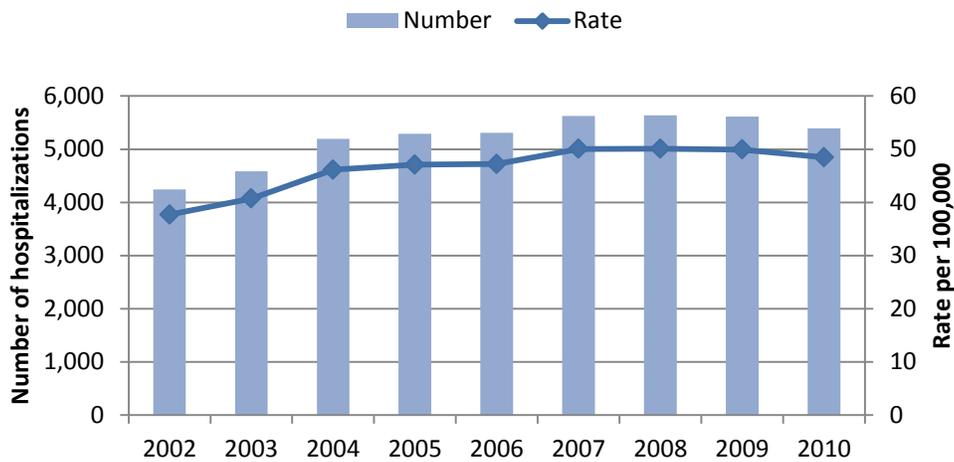
Source: Ohio Department of Health, Vital Statistics  
 \*Rates suppressed due to small cell sizes

Figure 11.3. Number of suicides by mechanism, Ohio, 2010



Source: Ohio Department of Health, Vital Statistics

**Figure 11.4. Number and age adjusted rate for self-harm hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

In 2010, nearly 5,400 hospitalizations resulted from self-harm. The self-harm hospitalization rate was 48.5 per 100,000 (Figure 11.4). The rate was higher among females (57 per 100,000) than males (40 per 100,000). For both males and females, hospitalization rates were highest among ages 15-54 then decreased among ages 55 and older (Figure 11.5). See Table 11.2 for a self-harm hospitalization risk profile.

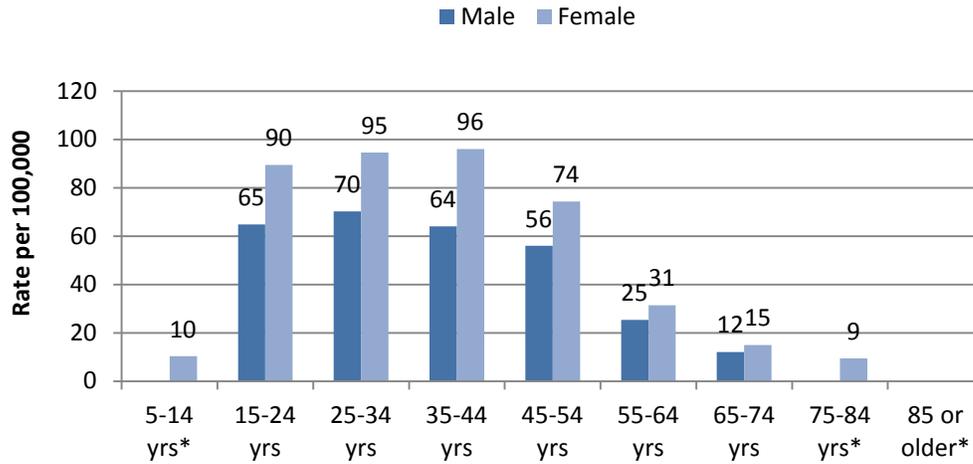
Roughly 92 percent of hospitalizations were associated with poisoning (Figure 11.6).

	2010 At Risk Groups	Annual trend Since 2002
Overall		+29%
Sex	Females	Similar for males and females
Age	15-44 yrs	45-54 (largest increase)

**TRENDS:**

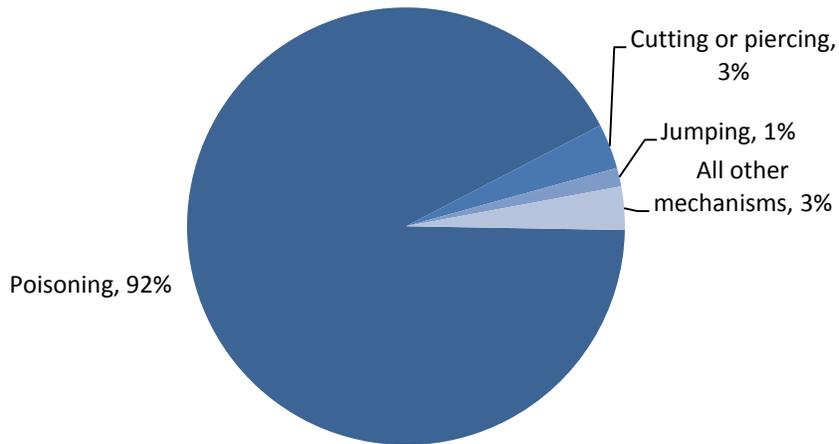
Hospitalization rates increased 29 percent from 37.7 per 100,000 in 2002 to 48.5 per 100,000 in 2010 (Figure 11.4). The average annual increase was 1.4 per 100,000 per year. The increase in rates was similar among males and females. Rates increased among ages 15-64 with the largest average increase found among adults ages 45-54 (3 per 100,000 per year). Rates among children ages 5-14 and adults ages 65-84 did not follow consistent trend. The number of self-harm hospitalizations resulting from poisoning increased by an average of 170 per year. Trends in other mechanisms did not following a consistent pattern over time. See Tables 41a-c located at the end of this section for more detailed information on the number and rates of self-harm related hospitalizations in Ohio.

Figure 11.5. Hospitalization rates for self-harm by age and sex, Ohio, 2010



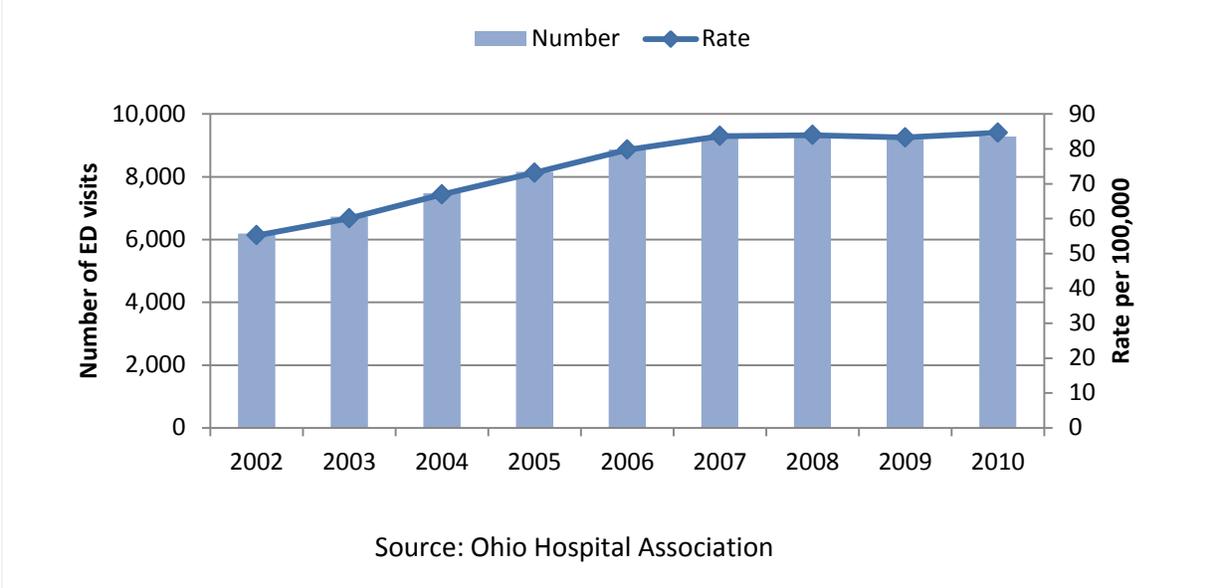
Source: Ohio Hospital Association

Figure 11.6. Distribution of hospitalizations resulting from self-harm, by mechanism, Ohio, 2010



Source: Ohio Hospital Association

**Figure 11.7. Number and age adjusted rate for self-harm related ED visits by year, Ohio, 2002-2010**



**EMERGENCY DEPARTMENT VISITS:**

Over 9,000 ED visits were associated with self-harm in 2010. The ED visit rate was 85 per 100,000 (Figure 11.7). Females were more likely than males to visit the ED. The highest rates of ED visits were among ages 15-24 and a steadily decrease in rates were found after age 25 (Figure 11.8). See Table 11.3 for a self-harm ED visit risk profile.

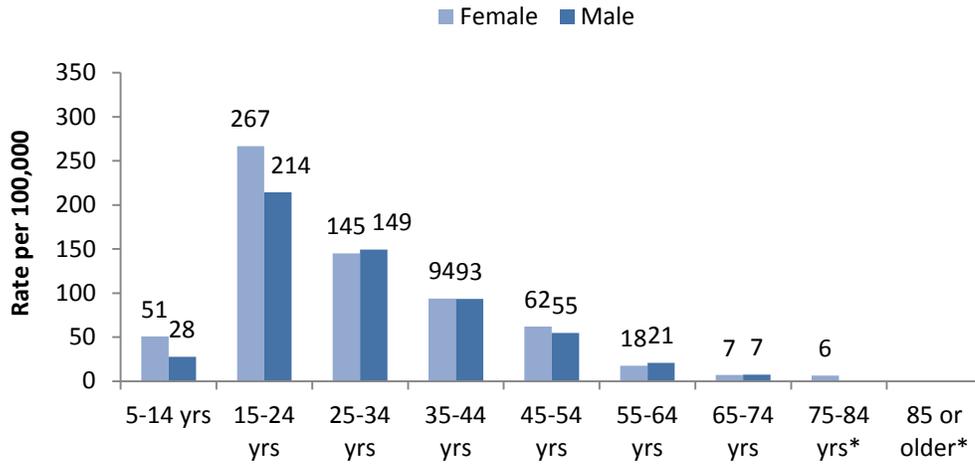
Most self-harm related ED visits were associated with poisonings (51 percent) and cutting or piercing (30 percent). Approximately 14 percent of self-harm related ED visits did not have a specified mechanism.

Table 11.3 Self-Harm ED Visit Risk Profile		
	2010 At Risk Groups	Trend since 2002
Overall		+53%
Sex	Females	Similar for males and females
Age	15-24	15-24 (largest increase)

**TRENDS:**

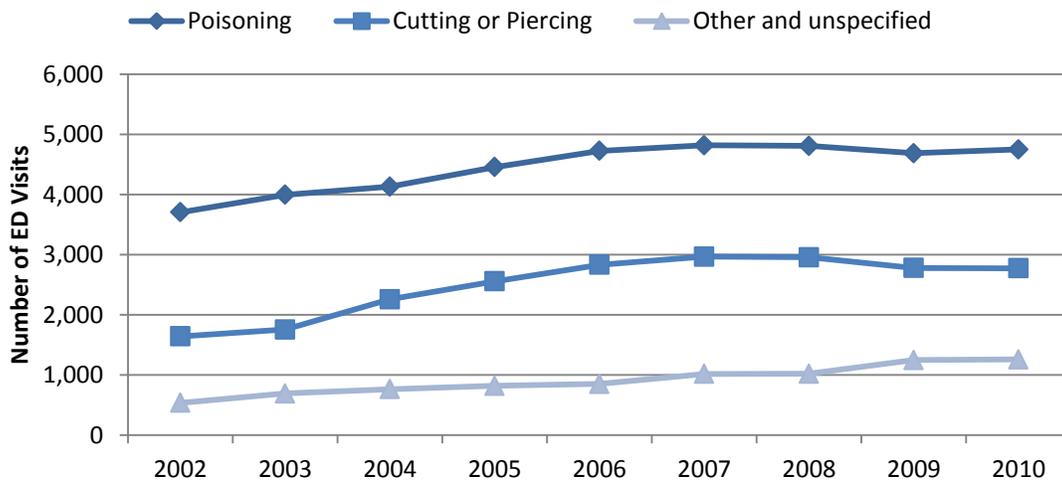
Between 2002 and 2010, the rate of ED visits resulting from self-harm increased 53 percent from 55 per 100,000 to 85 per 100,000 in 2010. Rates increased by an average of 4 per 100,000 per year. The increase was similar among males and females. ED visit rates increased among all age groups with the largest increases found among ages 15-24 (12 per 100,000 per year). The number of self-harm related ED visits resulting from cutting or piercing, poisoning, and other or unspecified mechanisms increased. The number of ED visits resulting from cutting or piercing increased by an average of 157 per year. An annual increase of 137 was found for poisoning while other and unspecified increased by an average of 88 ED visits per year (Figure 11.9). See Tables 42a-c located at the end of this section for more detailed information on self-harm related ED visits.

Figure 11.8. ED visit rates for self-harm by age and sex, Ohio, 2010



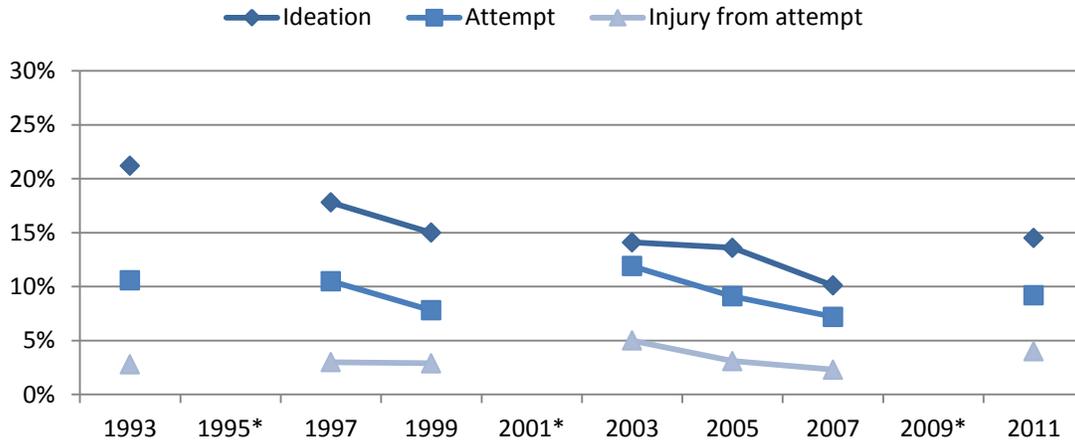
Source: Ohio Hospital Association

Figure 11.9. Number of ED visits resulting from self-harm, by mechanism and year, Ohio, 2002-2010



Source: Ohio Hospital Association

**Figure 11.10. Percentage of high school students who reported self-harm behaviors by behavior and year, Ohio, 1993-2011**



Source: Ohio Youth Risk Behavior Survey  
 \*Rates suppressed due to poor response rates

**SELF-HARM BEHAVIORS AMONG YOUTH:**

In 2011, approximately 1 in 7 or 14 percent of high school students reported to have seriously considered suicide in the past 12 months (Figure 11.10). Female (18%) were more likely to report suicide ideation than males (11%). Suicide ideation was reported more frequently by 9<sup>th</sup> graders and Hispanics compared students in other grades and race or ethnic group.

Approximately 1 in 10 or 9 percent of high school students reported to have attempted suicide in the past 12 months (Figure 11.10). The percentage of students who reported at least one suicide attempt was similar by sex and race or ethnic groups. Ninth grade students were nearly 3 times more likely to report a suicide attempt than students in the 12<sup>th</sup> grade.

In 2011, 1 in 25 or 4 percent of high school students reported an injury resulting from a suicide attempt in the last 12 months (Figure 11.10). The percentage of students who reported at least one suicide attempt related injury was similar by sex and race or ethnic groups. Ninth grade students were 2 times more likely to report a suicide attempt related injury than students in grades in 10, 11 or 12.

	2011	1993
Ideation	14%	28%
Attempts	9%	11%
Attempt Injuries	4%	3%

**TRENDS:**

The percentage of students who reported suicide ideation decreased from 1993 to 2007 and then increased between 2007 and 2011. The percentage of students who reported suicide attempts and injuries resulting from suicide attempts did not change significantly since 1993. See Tables 43a-c located at the end of this section for more detailed information about self-harm behaviors among high school students in Ohio.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 40a. Number of deaths resulting from suicides, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	1,091	1,214	1,267	1,108	1,318	1,330	1,309	1,269	1,402	1,370	1,420
<b>Sex</b>											
Males	899	1,000	1,015	920	1,035	1,095	1,029	1,041	1,117	1,082	1,129
Females	192	214	252	188	283	235	280	228	285	288	291
<b>Age</b>											
< 1 yr	0	0	0	0	0	0	0	0	0	0	0
1-4 yrs	0	0	0	0	0	0	0	0	0	0	0
5-14 yrs	10	6	16	12	19	10	12	8	15	15	6
15-24 yrs	140	157	148	137	182	179	174	166	186	167	180
25-34 yrs	162	192	204	207	211	195	215	193	223	198	246
35-44 yrs	259	270	271	226	252	270	226	252	293	262	245
45-54 yrs	207	242	247	226	290	282	306	284	308	330	317
55-64 yrs	97	128	135	125	166	182	187	190	188	206	216
65-74 yrs	88	90	108	79	98	80	77	80	103	100	108
75-84 yrs	96	97	100	71	75	96	82	71	60	61	72
85 or older	32	32	38	25	25	36	30	25	26	31	30
<b>Race and ethnicity</b>											
White‡	997	1,096	1,148	1,008	1,179	1,232	1,191	1,158	1,256	1,252	1,308
Black‡	83	96	83	83	100	80	93	92	111	92	79
Hispanic	6	11	18	8	25	9	17	11	21	17	21
Other‡	<5	9	7	6	11	<5	5	7	14	9	11

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 40b. Death rates per 100,000 resulting from suicides, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	9.5	10.6	11.0	9.6	11.3	11.4	11.1	10.8	12.0	11.6	12.1	0.20
<b>Sex†</b>												
Males	16.9	18.6	18.8	16.8	18.7	19.6	18.2	18.4	19.8	19.0	20.0	0.21 (NL)
Females	3.3	3.6	4.2	3.2	4.7	3.9	4.6	3.7	4.8	4.8	4.8	0.15
<b>Age</b>												
< 1 yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
1-4 yrs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
5-14 yrs	*	*	*	*	*	*	*	*	*	*	*	*
15-24 yrs	9.0	10.0	9.4	8.6	11.5	11.3	11.0	10.5	11.8	10.7	11.3	0.23 (NL)
25-34 yrs	10.7	12.9	13.8	14.0	14.3	13.3	14.7	13.2	15.2	13.4	17.5	0.35 (NL)
35-44 yrs	14.4	15.2	15.5	13.2	15.0	16.4	13.9	15.8	18.8	17.2	16.6	0.30 (NL)
45-54 yrs	13.1	14.8	15.0	13.5	17.1	16.4	17.6	16.2	17.5	18.8	18.2	0.50
55-64 yrs	9.6	12.5	12.5	11.1	14.2	15.0	14.8	14.6	14.1	14.9	14.9	0.44
65-74 yrs	11.2	11.5	14.0	10.3	12.7	10.4	9.9	10.1	12.6	12.0	12.7	0.02 (NL)
75-84 yrs	17.7	17.7	18.0	12.7	13.4	17.2	14.7	12.8	11.0	11.3	13.3	-0.61
85 or older	18.0	17.7	20.6	13.2	12.9	18.1	14.5	11.7	11.8	13.7	13.0	-0.62 (NL)
<b>Race and Ethnicity†</b>												
White‡	10.1	11.1	11.6	10.2	11.9	12.4	11.9	11.6	12.7	12.6	13.4	0.26
Black‡	6.5	7.6	5.9	6.4	7.3	5.9	6.9	6.6	8.0	6.7	5.5	-0.02 (NL)
Hispanic	*	*	*	*	9.7	*	*	*	6.9	*	6.3	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 40c. Number of deaths resulting from suicides, by mechanism and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Poisoning	203	215	246	175	270	259	273	231	268	250	239	17%	4.5 (NL)
Hanging	217	254	259	239	289	305	318	301	360	341	370	26%	14.3
Drowning	9	5	16	8	14	12	9	10	12	11	7	0%	*
Firearm	587	670	666	601	656	668	625	647	684	677	718	51%	7.3 (NL)
Explosive material	0	0	<5	0	<5	0	0	<5	0	0	0	0%	*
Smoke, fire, or flames	10	5	9	11	7	6	8	7	8	8	<5	*	*
Steam or hot vapors	0	0	0	0	0	0	0	0	<5	0	0	0%	*
Sharp object	18	20	23	16	21	21	16	14	17	30	22	2%	*
Jumping	28	27	29	45	46	39	42	22	33	30	35	2%	0.08 (NL)
Motor vehicle crash	6	<5	7	<5	<5	5	<5	8	5	<5	8	1%	*
Other means	7	<5	<5	6	5	<5	9	<5	8	6	10	1%	*
Unspecified means	5	11	7	<5	5	12	<5	24	<5	9	<5	*	*
Sequelae of suicide	<5	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	*	*

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 41a. Number of hospitalization resulting from self-harm, by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	4,245	4,587	5,196	5,289	5,308	5,624	5,636	5,613	5,394
<b>Sex</b>									
Males	1,713	1,899	2,118	2,178	2,155	2,405	2,414	2,409	2,231
Females	2,532	2,688	3,078	3,111	3,153	3,219	3,222	3,204	3,163
<b>Age</b>									
5-14 yrs	131	119	116	148	130	128	100	80	95
15-24 yrs	1,014	1,107	1,204	1,230	1,277	1,268	1,320	1,269	1,223
25-34 yrs	916	1,023	1,188	1,101	1,170	1,199	1,194	1,180	1,163
35-44 yrs	1,180	1,194	1,306	1,390	1,265	1,381	1,284	1,301	1,187
45-54 yrs	639	778	935	977	968	1,115	1,140	1,189	1,139
55-64 yrs	188	227	291	295	325	354	409	425	414
65-74 yrs	86	65	76	82	107	99	111	89	116
75-84 yrs	67	56	58	46	58	58	54	65	43
85 or older	24	18	22	20	8	22	24	15	14

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 41b. Hospitalization rates per 100,000 resulting from self-harm, by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	40.5	43.7	49.5	50.6	50.7	53.8	53.8	53.6	52.1	1.5
<b>Sex†</b>										
Males	33.3	36.6	40.9	42.1	41.6	46.3	46.4	46.5	43.3	1.4
Females	47.8	50.9	58.2	59.1	59.8	61.3	61.2	60.8	60.8	1.5
<b>Age</b>										
5-14 yrs	8.1	7.4	7.3	9.5	8.5	8.4	6.7	5.4	6.2	-0.27 (NL)
15-24 yrs	64.1	69.4	75.5	77.2	80.7	80.5	84.0	81.1	77.1	1.79
25-34 yrs	62.1	69.8	81.3	75.5	80.3	82.1	81.6	79.8	82.5	1.98
35-44 yrs	67.6	70.0	77.9	84.4	78.0	86.7	82.5	85.6	80.2	1.80
45-54 yrs	38.8	46.5	55.1	56.9	55.7	63.8	65.1	67.8	65.4	3.28
55-64 yrs	17.4	20.2	24.9	24.3	25.9	27.3	30.7	30.7	28.5	1.51
65-74 yrs	11.1	8.5	9.9	10.7	13.9	12.7	13.8	10.6	13.6	0.44 (NL)
75-84 yrs	12.1	10.1	10.4	8.3	10.6	10.7	10.1	12.0	7.9	-0.16 (NL)
85 or older	12.7	*	11.0	9.7	*	9.9	10.5	*	*	*

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

**Table 41c. Number of hospitalizations resulting from self-harm by mechanism and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Poisoning	3,730	4,026	4,695	4,869	4,919	5,269	5,297	5,238	4970	92.1%	170
Hanging	126	166	127	44	53	41	44	37	<5	*	*
Drowning	52	69	40	41	<5	<5	<5	86	31	0.6%	*
Firearms	106	89	89	68	83	80	73	164	43	0.8%	-1 (NL)
Cutting or piercing	132	144	141	166	169	139	140	26	74	1.4%	-10 (NL)
Jumping	38	25	32	24	27	33	21	60	180	3.3%	11 (NL)
Other and unspecified	57	61	62	69	54	61	56	<5	27	0.5%	*
Late effects	5	7	10	10	<5	0	<5	0	66	1.2%	*

\*Suppressed due to less than 20 hospitalizations.

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 42a. Number of ED visits resulting from self-harm by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	6,180	6,716	7,473	8,158	8,864	9,252	9,264	9,170	9,276
<b>Sex</b>									
Males	2,689	2,860	3,241	3,554	4,037	4,186	4,300	4,155	4,350
Females	3,491	3,856	4,232	4,604	4,827	5,066	4,964	5,015	4,926
<b>Age</b>									
5-14 yrs	387	476	586	508	587	618	575	594	593
15-24 yrs	2,419	2,684	3,075	3,311	3,551	3,771	3,742	3,821	3,810
25-34 yrs	1,462	1,570	1,632	1,774	1,996	2,042	2,105	2,001	2,076
35-44 yrs	1,195	1,225	1,297	1,463	1,505	1,588	1,494	1,424	1,385
45-54 yrs	547	593	655	849	883	896	1,005	1,022	1,019
55-64 yrs	104	118	154	172	238	252	246	226	280
65-74 yrs	35	29	42	47	53	46	59	47	61
75-84 yrs	23	15	19	28	35	27	27	28	39
85 or older	8	6	13	6	16	12	11	7	13

Source: Ohio Hospital Association

**Table 42b. ED visit rates per 100,000 resulting from self-harm by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	55.1	60.0	66.8	73.1	79.7	83.6	83.9	83.2	84.6	3.9
<b>Sex†</b>										
Males	48.8	51.2	58.0	63.7	72.6	75.4	77.7	75.0	79.5	4.1
Females	62.2	68.9	75.9	82.7	87.3	92.1	90.3	91.6	90.0	3.6
<b>Age</b>										
5-14 yrs	24.0	29.8	37.1	32.7	38.2	40.8	38.4	39.7	38.9	1.7
15-24 yrs	152.9	168.3	192.7	207.9	224.5	239.5	238.1	244.2	240.1	11.7
25-34 yrs	99.1	107.1	111.7	121.7	137.1	139.7	143.8	135.4	147.2	6.0
35-44 yrs	68.5	71.8	77.4	88.8	92.8	99.7	96.0	93.7	93.6	3.6
45-54 yrs	33.2	35.5	38.6	49.4	50.8	51.3	57.4	58.3	58.5	3.5
55-64 yrs	9.6	10.5	13.2	14.2	18.9	19.4	18.5	16.3	19.3	1.2
65-74 yrs	4.5	3.8	5.5	6.1	6.9	5.9	7.3	5.6	7.2	0.3
75-84 yrs	4.2	*	*	5.1	6.4	5.0	5.0	5.2	7.2	*
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 ED visits

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 42c. Number of ED visit resulting from self-harm by method and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Poisoning	3,706	3,998	4,131	4,457	4,729	4,820	4,809	4,687	4,751	51%	138
Hanging	153	159	195	197	268	281	312	303	301	3%	22
Drowning	16	13	6	5	8	5	11	10	11	*	*
Firearms	87	72	52	85	98	102	75	89	90	1%	2 (NL)
Cutting or piercing	1,643	1,757	2,259	2,558	2,832	2,968	2,958	2,780	2,774	30%	157
Jumping	33	26	32	26	55	47	53	44	40	0%	2 (NL)
Other and unspecified	535	692	763	818	851	1,017	1,021	1,247	1,258	14%	88
Late effects	16	11	15	17	29	22	35	21	23	*	*

NL: Interpret with caution because trend does not follow linear pattern.

Source: Ohio Hospital Association

**Table 43a. Percentage of high school students who reported suicide ideation, by sex, grade level, and race/ethnicity, Ohio, 1993-2011**

	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
Overall	28.1%	UW	23.0%	20.3%	**	18.2%	17.9%	13.4%	UW	14.3%
<b>Sex</b>										
Males	20.9%		15.2%	15.7%		15.2%	14.6%	10.6%		10.7%
Females	35.6%		30.8%	24.9%		21.3%	21.5%	16.0%		18.1%
<b>Grade</b>										
9th	24.8%		24.8%	18.5%		18.3%	16.0%	14.3%		18.1%
10th	24.9%		24.9%	24.5%		19.6%	21.8%	13.0%		13.8%
11th	22.3%		22.3%	18.1%		17.1%	15.8%	13.2%		14.7%
12th	18.8%		18.8%	19.7%		17.3%	18.7%	12.7%		10.3%
<b>Race and Ethnicity</b>										
White, non-Hispanic	NA		23.0%	20.2%		16.6%	18.9%	12.5%		14.4%
Black, non-Hispanic			*	*		*	11.9%	14.5%		10.9%
Hispanic			*	*		*	*	19.9%		21.9%

\*Percentages suppressed to due to fewer than 100 respondents.

\*\*Survey was not conducted.

NA: Not available

Source: Ohio Youth Risk Behavior Survey

UW: Ohio did not achieve sufficient response rate for weighted data.

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 43b. Percentage of high school students who reported making a suicide attempt, by sex, grade level, and race/ethnicity, Ohio, 1993-2011**

	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
Overall	10.6%	UW	10.5%	7.8%	**	11.9%	9.1%	7.2%	UW	9.1%
<b>Sex</b>										
Males	6.3%		6.0%	5.0%		10.8%	6.9%	4.9%		8.0%
Females	15.0%		15.0%	10.6%		12.8%	11.3%	9.4%		9.9%
<b>Grade</b>										
9th	12.5%		11.0%	9.0%		13.6%	10.8%	7.3%		13.3%
10th	9.3%		13.3%	9.1%		9.2%	12.9%	7.2%		8.6%
11th	9.8%		11.3%	6.0%		13.6%	6.2%	6.0%		8.7%
12th	10.0%		5.7%	6.4%		11.0%	6.3%	7.4%		5.3%
<b>Race and Ethnicity</b>										
White, non-Hispanic	NA		9.7%	7.1%		11.2%	8.7%	6.4%		8.3%
Black, non-Hispanic			10.0%	4.5%		*	12.6%	8.6%		8.7%
Hispanic			*	*		*	*	12.5%		*

\*Percentages suppressed to due to fewer than 100 respondents.

\*\*Survey was not conducted.

NA: Not available

Source: Ohio Youth Risk Behavior Survey

UW: Ohio did not achieve sufficient response rate for weighted data.

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 43c. Percentage of high school students who reported an injury after making a suicide attempt, by sex, and grade level, Ohio, 1993-2011**

	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
Overall	2.8%	UW	3.0%	2.9%	**	5.0%	3.1%	2.3%	UW	4.0%
<b>Sex</b>										
Males	1.3%		2.2%	2.5%		4.2%	2.0%	1.5%		4.1%
Females	4.2%		3.7%	3.3%		5.7%	4.1%	3.1%		3.9%
<b>Grade</b>										
9th	4.0%		3.1%	4.3%		5.9%	3.2%	1.8%		6.8%
10th	2.7%		4.0%	2.2%		2.8%	5.1%	3.1%		3.0%
11th	1.3%		2.7%	2.0%		6.9%	2.8%	2.0%		3.2%
12th	2.3%		1.6%	2.2%		4.3%	1.1%	1.6%		2.9%
<b>Race and Ethnicity</b>										
White, non-Hispanic	NA		2.4%	2.7%		4.0%	2.8%	1.7%		3.7%
Black, non-Hispanic			3.2%	0.7%		*	5.0%	2.6%		3.8%
Hispanic			*	*		*	*	6.3%		*

\*Percentages suppressed to due to fewer than 100 respondents.

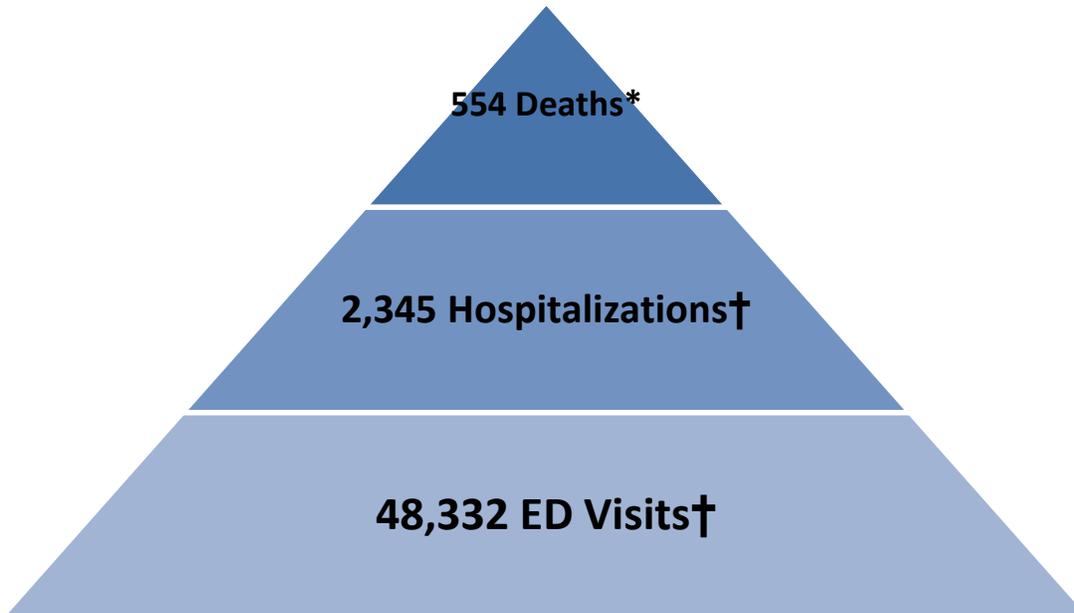
\*\*Survey was not conducted.

NA: Not available

Source: Ohio Youth Risk Behavior Survey

UW: Ohio did not achieve sufficient response rate for weighted data.

## SECTION 4.2: HOMICIDES AND ASSAULTS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

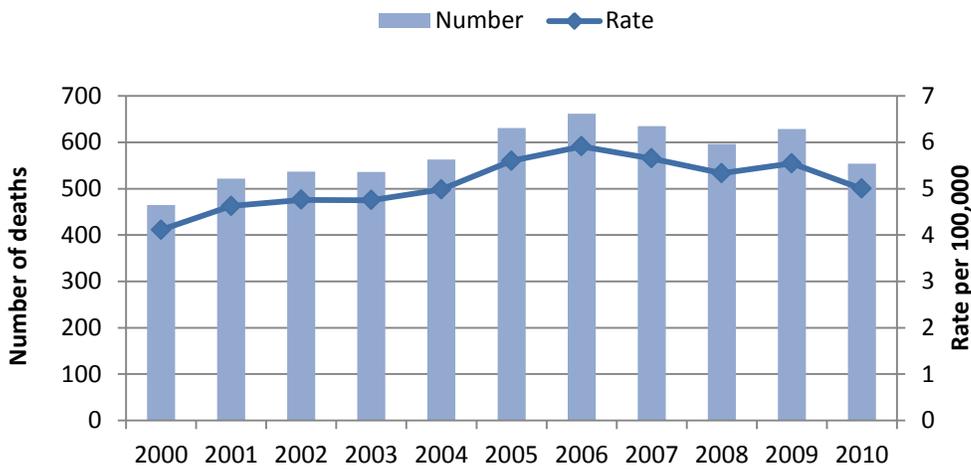
#### Patterns:

- Significant disparities were found in homicide rates by race and sex. Blacks were 10 times more likely to die from homicides than whites. Males were 4 times more likely to die from homicides than females.
- Highest rates of homicides and assaults were found among males ages 15-34.
- Firearms were the most common cause of homicide and assault related hospitalizations while fighting was the most common cause of assault related ED visits.
- 1 in 3 high school students reported being in a physical fight during the last 12 months.

#### Trends:

- Disparities in homicide rates by race and sex have increased since 2000.
- Hospitalization rates increased slightly while ED visits increased 50 percent.
- The largest increases in homicides and assault related ED visits were found among males ages 25-34
- Firearms were the most common cause of homicide and assault related hospitalizations while fighting was the most common cause of assault related ED visits throughout the study period.
- Percentage of high school students who reported being in a physical fight decreased since 1997.

**Figure 12.1 Number and age adjusted rate for homicides by year, Ohio, 2000-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**DEATHS:**

In 2010, 554 homicides occurred in Ohio. The homicide rate was 5.0 per 100,000 (Figure 12.1). Rates varied significantly by sex, age, and race. Homicide rates were 4 times higher among males (8.0 per 100,000) compared to females (2.1 per 100,000). The highest rates were found among ages 25-34 (11.3 per 100,000) followed by ages 15-24 (9.1 per 100,000). A significant disparity in rates was found by race. Blacks were 10 times more likely to die from a homicide than whites (22.7 per 100,000 compared to 2.2 per 100,000). See Table 12.1 for homicide risk profile.

The most common mechanisms associated with homicides were firearms (70 percent) followed by sharp objects (10 percent) and hanging (4 percent). Approximately 9 percent of homicides had an unspecified mechanism.

**TRENDS:**

Homicide rates increased from 4.0 per 100,000 in 2000 to 5.0 per 100,000 in 2010. While an increase in rates was observed, results from the trend analysis indicate that rates did not follow a consistent linear pattern throughout the period. Disparities in homicide rates increased by sex and race. Males were 2 times more likely than females to die from a homicide in 2000 and were 4 times more likely to die from a homicide than females in 2010 (data not shown). Blacks were 6 times more likely than whites to die from a homicide in 2000 and were 10 times more likely than whites to die from a homicide in 2010 (Figure 12.2). Firearms were the most common mechanism associated with homicides throughout the study period. The number of homicides associated with firearms increased by an average of 17 per year while homicides resulting from sharp objects,

**Table 12.1 Homicide Risk Profile**

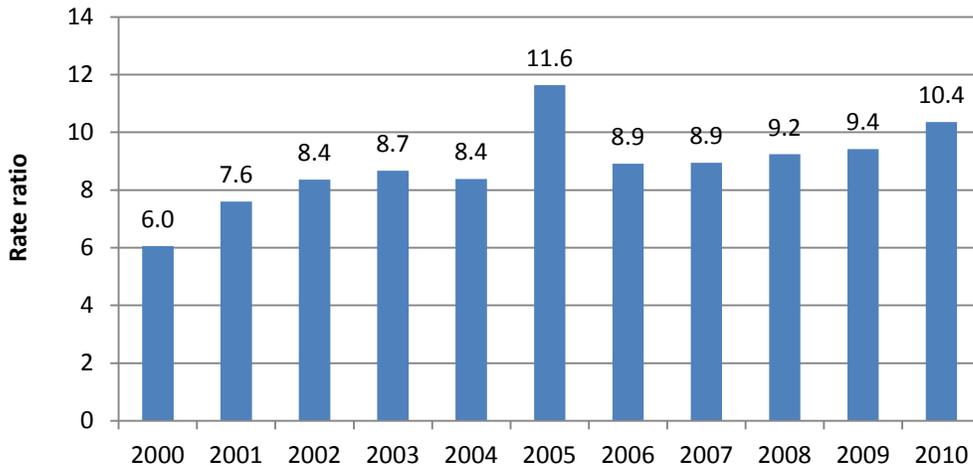
	2010 At Risk Groups	Annual Trend since 2000
<b>Overall</b>		Inconsistent
<b>Sex</b>	Males	Males (largest increase)
<b>Age</b>	25-34	25-34 (largest increase)
<b>Race and ethnicity</b>	Blacks	Blacks (largest increase)

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

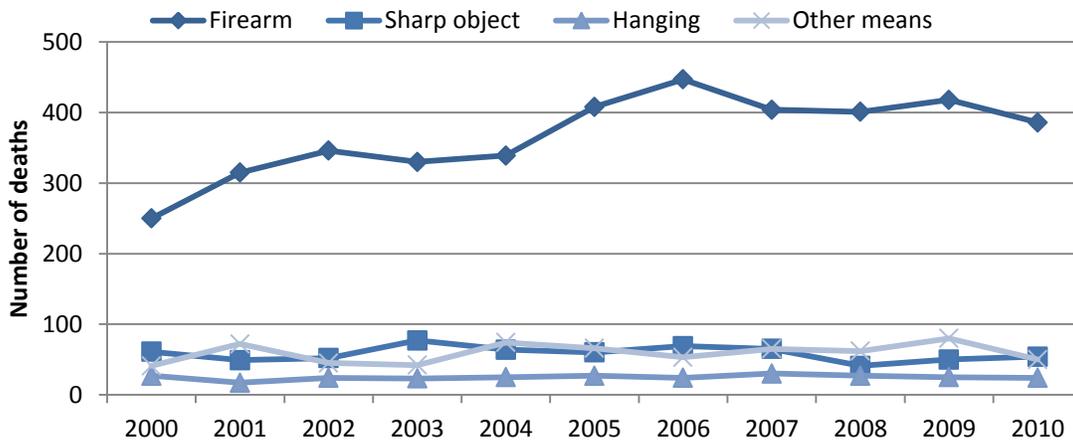
hanging, and other means did not follow a consistent trend (Figure 12.3). See Tables 44a-c located at the end of the section for more detailed information on homicides.

**Figure 12.2. Black to white homicide rate ratio by year, Ohio, 2000- 2010**



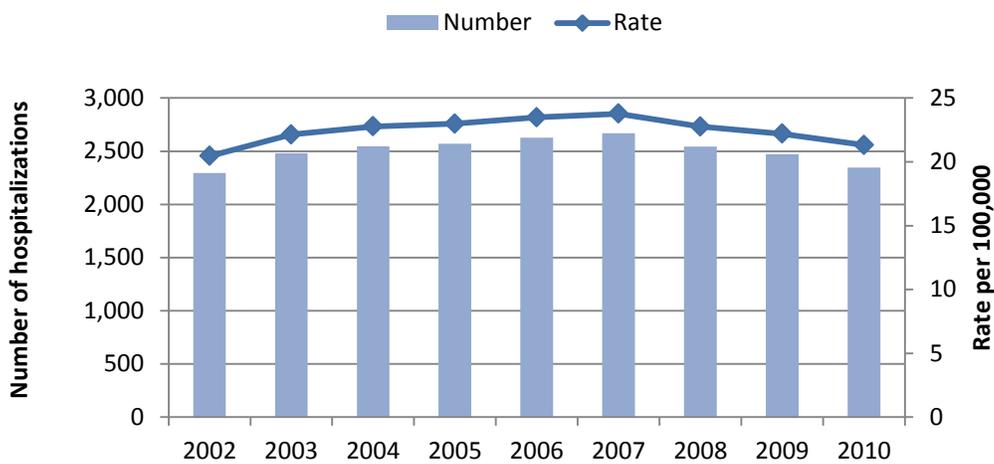
Source: Ohio Department of Health, Office of Vital Statistics

**Figure 12.3. Number of homicides by mechanism and year, Ohio, 2000-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**Figure 12.4. Number and age adjusted rate for assault related hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

In 2010, approximately 2,300 hospitalizations resulted from assaults. The assault hospitalization rate was 21.3 per 100,000 (see Figure 12.4). The rate was 6 times higher among males (37 per 100,000) than females (6 per 100,000). Among males, the highest hospitalization rates were found among ages 15-34. Among females, the highest rates were found among infants less than 1 year of age (Figure 12.5). See Table 12.2 for an assault hospitalization risk profile.

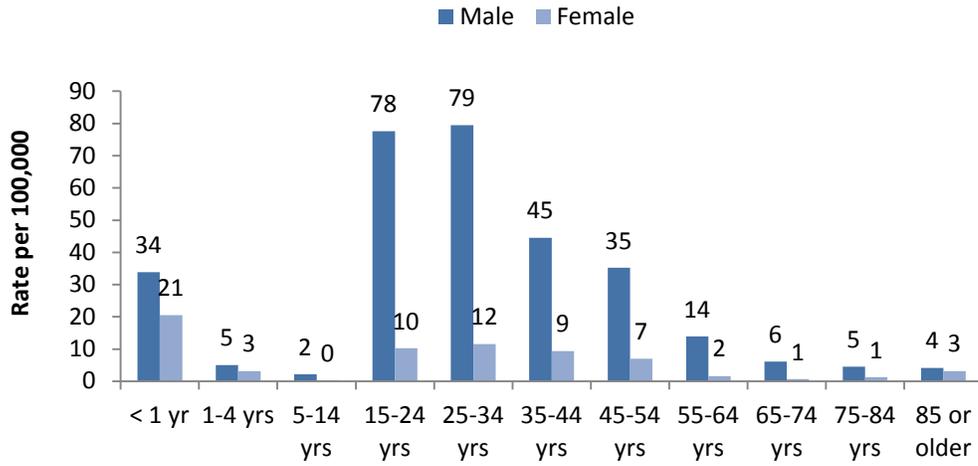
	2010 At Risk Groups	Annual Trend Since 2002
Overall		Inconsistent
Sex	Males	Inconsistent
Age	15-34	Inconsistent

The leading mechanisms associated with assault related hospitalizations were firearms or explosives (27 percent), fights or brawls (24 percent), and cutting or piercing (14 percent). An additional 31 percent of hospitalizations listed other or unspecified mechanisms (Figure 12.6).

**TRENDS:**

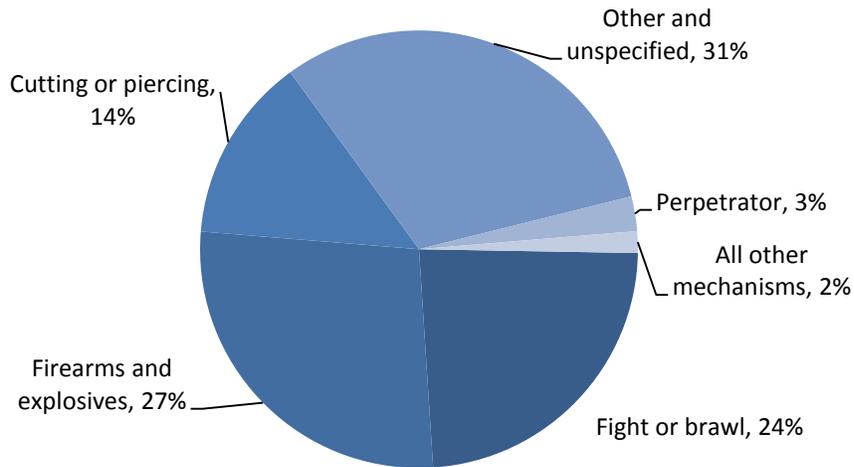
The assault related hospitalization rate increased slightly from 20.5 per 100,000 in 2002 to 21.3 per 100,000 in 2010. While a slight increase was found, rates did not follow a consistent pattern. Inconsistent patterns were also found among males, females, and all age groups. Firearms, fights, cuts or pierces, and other or unspecified means were the most common mechanisms associated with assault related hospitalizations throughout the study period. However, none of the leading mechanisms followed a consistent trend. See Tables 45a-c located at the end of this section for more detailed information about assault related hospitalizations in Ohio.

Figure 12.5. Hospitalization rates for assaults by age and sex, Ohio, 2010



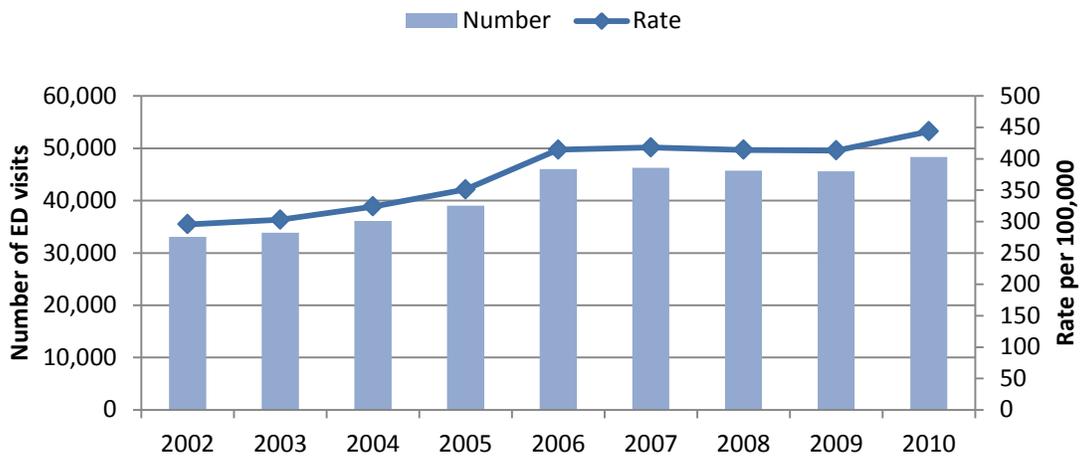
Source: Ohio Hospital Association

Figure 12.6. Distribution of hospitalizations resulting from assaults, by mechanism, Ohio, 2010



Source: Ohio Hospital Association

**Figure 12.7. Number and age adjusted rate for assault related ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

Approximately 48,000 ED visits were associated with assaults in 2010. The ED visit rate was 444 per 100,000 (Figure 12.7). ED visit rates were higher among than females throughout the lifespan. ED visits increased from birth through age 24 and then steadily decreased after age 25 (Figure 12.8). See Table 12.3 for an assault ED visit risk profile.

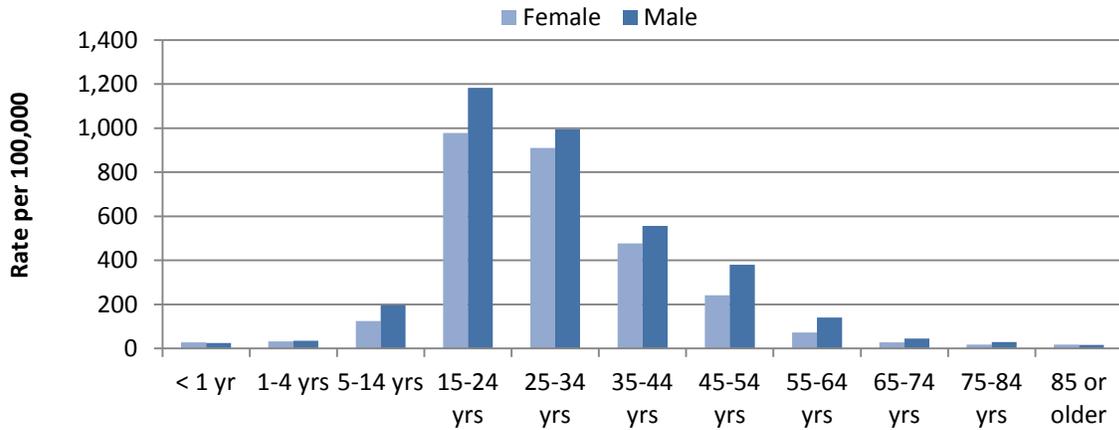
Nearly one-half of assault related ED visits were associated with fights or brawls (43 percent) and 42 percent were associated with other or unspecified reasons.

Table 12.3 Assault ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend since 2002
Overall		+50%
Sex	Males	Males (largest increase)
Age	15-24	25-34 (largest increase)

**TRENDS:**

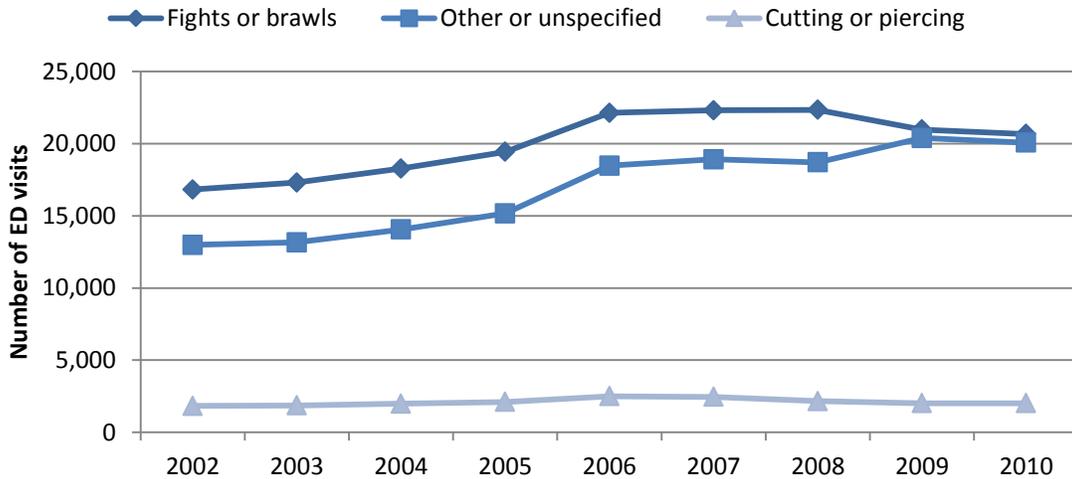
Assault related ED visits increased 50 percent from 296 per 100,000 in 2002 to 444 per 100,000 in 2010. Rates increased by an average of 20 per 100,000 per year. The average annual increase was slightly larger among males (26 per 100,000 per year) than females (20 per 100,000 per year). The largest annual increases were found among ages 25-34 (48 per 100,000 per year) and ages 15-24 (44 per 100,000). The largest annual increases in the number of ED visits resulted from other or unspecified means (1,056) and fights or brawls (623 per year). The number of ED visits resulting cuts or pierces did not follow a consistent linear trend (Figure 12.9). See Tables 46a-c located at the end of this section for more detailed information on assault related ED visits.

**Figure 12.8. ED visit rates resulting from assaults by age and sex, Ohio, 2010**



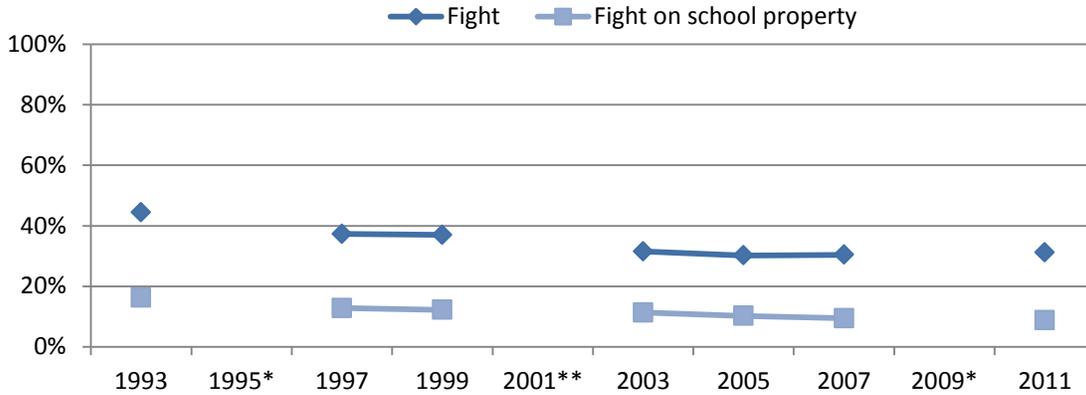
Source: Ohio Hospital Association

**Figure 12.9 Number of ED visits resulting from assaults, by mechanism and year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**Figure 12.10. Percentage of high school students who reported a physical fight and a fight on school property in last 12 months, Ohio, 1993-2011**



Source: Ohio Youth Risk Behavior Survey. \*\*Data not collected.

\*Suppressed due to poor response rate.

## PHYSICAL FIGHTING AMONG HIGH SCHOOL STUDENTS

In 2011, Approximately 1 in 3 high school students reported being in a physical fight in the last 12 months (Figure 12.10). Males were more likely than females to report physical fighting (38 percent versus 24 percent). Students in 9<sup>th</sup> grade (28 percent) were more likely to report being in a physical fight than students in 12<sup>th</sup> grade (21 percent). Hispanic students (45 percent) were more likely to report being in a physical fight than white, non-Hispanic students (29 percent) (Figure 12.11). See Table 12.4 for a youth physical fight risk profile.

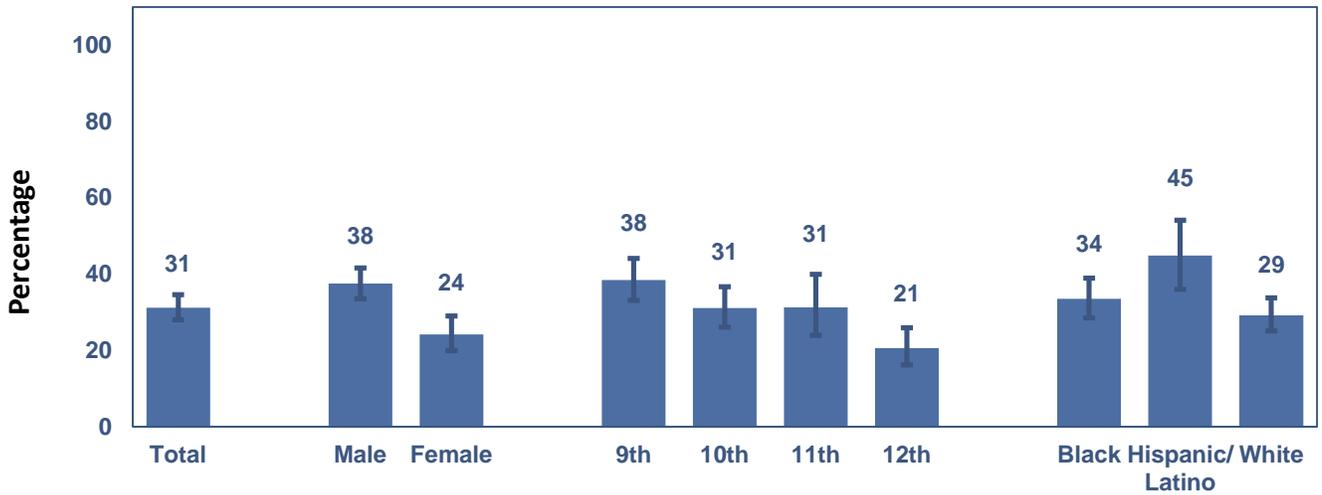
Since 1997, the percentage of students who reported being in a physical fight decreased 16 percent. The largest decreases in physical fighting were reported among female, 10<sup>th</sup> grade, and black non-Hispanic students (Figure 12.10).

	2011 At Risk Groups	Trend since 1997
<b>Overall</b>	31%	Decrease (-16%)
<b>Sex</b>	Males	Females (-19%)
<b>Grade</b>	9 <sup>th</sup> grade	10 <sup>th</sup> grade (-20%)
<b>Race and ethnicity</b>	Hispanic	Blacks (-26%)

In 2011, approximately 1 in 12 or 9 percent of high school students reported being in a physical fight on school property in the last 12 months (Figure 12.10). Males were nearly two times more likely than females to report being in physical fight (11 percent versus 6 percent). Students in 9<sup>th</sup> grade (13 percent) were approximately 2 times more likely to report being in a physical fight than students in 12<sup>th</sup> grade (6 percent). Black non-Hispanic students (13 percent) were more likely to report being in a physical fight than white, non-Hispanic students (8 percent) (Figure 12.12).

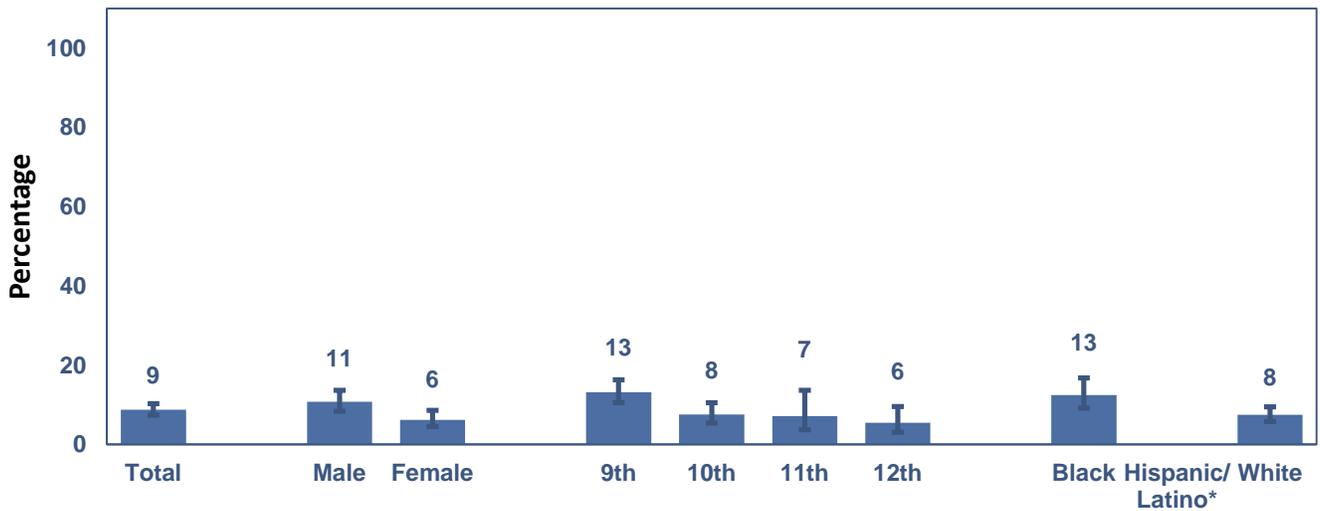
Fighting on school property followed a similar trend as physical fighting among youth as a whole with a 31 percent decrease since 1997.

**Figure 12.11. Percentage of high school students who reported being in a physical fight in last 12 months, Ohio 2011**



Source: Ohio Youth Risk Behavior Survey

**Figure 47c. Percentage of high school students who reported being in a physical fight on school property in last 12 months, Ohio 2011**



Source: Ohio Youth Risk Behavior Survey

\*Suppressed due to poor response rate.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 44a. Number of deaths resulting from assaults, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	465	522	537	536	563	631	662	635	597	629	554
<b>Sex</b>											
Males	313	373	387	406	421	479	506	491	465	486	436
Females	152	149	150	130	142	152	156	144	132	143	118
<b>Age</b>											
< 1 yr	7	17	16	17	10	14	14	11	16	13	14
1-4 yrs	18	23	18	16	12	11	19	25	17	23	16
5-14 yrs	22	14	9	9	11	20	26	10	7	16	6
15-24 yrs	104	125	146	160	156	171	168	160	159	147	145
25-34 yrs	95	115	126	132	133	168	167	174	157	165	159
35-44 yrs	88	108	100	87	102	102	124	103	102	90	79
45-54 yrs	66	66	57	64	77	84	80	97	72	88	69
55-64 yrs	21	19	30	21	27	33	35	25	32	52	36
65-74 yrs	22	20	16	13	17	18	12	18	14	16	19
75-84 yrs	17	10	16	12	15	8	10	9	19	10	8
85 or older	5	5	<5	5	<5	<5	7	<5	<5	9	<5
<b>Race and ethnicity</b>											
White‡	246	240	235	224	236	217	268	255	234	247	202
Black‡	207	264	285	288	289	383	363	351	336	352	335
Hispanic	6	11	7	22	30	23	23	24	23	29	12
Other‡	<5	5	6	0	<5	6	6	5	<5	<5	5

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 44b. Death rates per 100,000 resulting from assaults, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	4.1	4.6	4.8	4.8	5.0	5.6	5.9	5.7	5.3	5.5	5.0	0.11 (NL)
<b>Sex†</b>												
Males	5.6	6.7	7.0	7.3	7.5	8.5	9.1	8.8	8.4	8.7	8.0	0.26
Females	2.6	2.6	2.6	2.3	2.5	2.7	2.7	2.5	2.3	2.4	2.1	-0.01
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	3.0	3.8	3.0	2.7	2.0	1.8	3.2	4.2	*	3.9	2.8	0.03 (NL)
5-14 yrs	1.3	*	*	*	*	*	*	*	*	1.1	*	*
15-24 yrs	6.7	8.0	9.2	10.1	9.8	10.8	10.6	10.2	10.1	9.4	9.1	0.19 (NL)
25-34 yrs	6.3	7.7	8.5	8.9	9.0	11.4	11.4	11.9	10.7	11.2	11.3	0.49
35-44 yrs	4.9	6.1	5.7	5.1	6.1	6.2	7.6	6.4	6.5	5.9	5.3	0.08 (NL)
45-54 yrs	4.2	4.0	3.5	3.8	4.5	4.9	4.6	5.5	4.1	5.0	4.0	0.07 (NL)
55-64 yrs	2.1	*	2.8	1.9	2.3	2.7	2.8	1.9	2.4	3.8	2.5	0.07 (NL)
65-74 yrs	2.8	2.6	*	*	*	*	*	*	*	*	*	*
75-84 yrs	*	*	*	*	*	*	*	*	*	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*	*	*
<b>Race and ethnicity†</b>												
White‡	2.6	2.5	2.5	2.4	2.5	2.3	2.8	2.7	2.5	2.6	2.2	<-0.01 (NL)
Black‡	15.4	19.1	20.5	20.5	20.7	27.0	25.3	24.2	23.1	24.1	22.7	0.7
Hispanic	*	*	*	8.6	9.7	8.4	7.2	6.6	8.5	7.4	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 44c. Number of deaths resulting from assaults, by cause and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Drugs or biologic substances	0	0	<5	<5	<5	5	<5	<5	<5	<5	0	0%	*
Gases and vapors	5	<5	0	<5	10	<5	0	0	6	<5	0	0%	*
Unspecified chemicals	0	<5	0	0	0	0	0	0	0	0	0	0%	*
Hanging	27	17	24	23	25	27	24	30	27	25	24	4%	*
Drowning	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	*	*
Firearm	250	315	346	330	339	408	447	404	401	418	386	70%	14
Explosive material	0	0	0	0	0	0	<5	0	0	0	0	0%	*
Smoke, fire, or flames	16	<5	16	12	11	13	19	10	15	6	6	1%	*
Sharp object	61	49	52	77	64	60	69	65	41	50	54	10%	-0.75
Blunt object	<5	<5	<5	<5	<5	<5	<5	7	<5	0	0	0%	*
Pushing	<5	0	0	0	<5	<5	0	0	<5	<5	0	0%	*
Motor vehicle crash	9	10	<5	<5	<5	0	0	<5	0	0	<5	*	*
Bodily force	<5	10	<5	11	<5	<5	<5	<5	<5	<5	<5	*	*
Negligence or abandonment	<5	5	<5	<5	0	0	0	0	<5	<5	0	0%	*
Other maltreatment	8	12	13	9	9	10	8	12	10	16	9	2%	*
Other means	30	7	22	15	5	21	19	22	19	12	8	1%	*
Unspecified means	41	72	45	42	74	66	53	65	62	80	50	9%	1.39 (NL)
Sequelae of assault	8	13	<5	5	13	12	12	12	5	9	10	2%	*

\*Suppressed due less than 20 deaths.

NL: Interpret with caution, does not follow linear trend ( $R^2 < 0.5$ )

Source: Ohio Department of Health, Office of Vital Statistics

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 45a. Number of hospitalizations resulting from assaults by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	2,295	2,480	2,547	2,572	2,628	2,668	2,543	2,473	2,345
<b>Sex</b>									
Males	1,909	2,077	2,113	2,179	2,198	2,257	2,110	2,069	2,002
Females	386	403	434	393	430	411	433	404	343
<b>Age</b>									
< 1 yr	63	70	64	62	84	86	76	76	38
1-4 yrs	35	35	30	34	38	39	50	37	24
5-14 yrs	23	31	29	39	52	41	29	35	19
15-24 yrs	693	709	729	798	740	760	741	763	705
25-34 yrs	565	599	641	604	605	632	634	601	640
35-44 yrs	512	568	570	525	527	478	449	434	397
45-54 yrs	295	343	349	351	387	472	375	359	363
55-64 yrs	57	73	81	96	120	104	125	115	110
65-74 yrs	24	22	24	36	32	31	27	27	27
75-84 yrs	23	17	22	22	28	16	24	14	14
85 or older	5	13	8	5	15	9	13	12	8

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 45b. Hospitalization rates per 100,000 resulting from assaults by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	20.5	22.1	22.8	23.0	23.5	23.8	22.8	22.2	21.3	0.07 (NL)
<b>Sex†</b>										
Males	34.2	37.3	38.0	39.0	39.3	40.2	37.8	37.1	36.5	0.16 (NL)
Females	6.9	7.2	7.7	7.0	7.6	7.4	7.7	7.2	6.2	-0.03 (NL)
<b>Age</b>										
< 1 yr	42.8	47.5	42.9	42.3	56.7	56.7	49.8	51.4	27.3	-0.36 (NL)
1-4 yrs	5.8	5.9	5.0	5.7	6.5	6.6	8.5	6.3	4.1	0.04 (NL)
5-14 yrs	1.4	1.9	1.8	2.5	3.4	2.7	1.9	2.3	*	*
15-24 yrs	43.8	44.5	45.7	50.1	46.8	48.3	47.1	48.8	44.4	0.28 (NL)
25-34 yrs	38.3	40.8	43.9	41.4	41.5	43.3	43.3	40.7	45.4	0.48 (NL)
35-44 yrs	29.3	33.3	34.0	31.9	32.5	30.0	28.9	28.6	26.8	-0.61 (NL)
45-54 yrs	17.9	20.5	20.6	20.4	22.3	27.0	21.4	20.5	20.8	0.33 (NL)
55-64 yrs	5.3	6.5	6.9	7.9	9.5	8.0	9.4	8.3	7.6	0.33 (NL)
65-74 yrs	3.1	2.9	3.1	4.7	4.2	4.0	3.3	3.2	3.2	0.02 (NL)
75-84 yrs	4.2	*	4.0	4.0	5.1	*	4.5	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 hospitalizations.

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 45c. Number of hospitalizations resulting from assaults by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Fight or brawl	513	525	489	511	478	578	574	530	555	24%	7 (NL)
Rape	6	6	13	5	14	6	15	8	<5	*	*
Corrosive substance	<5	<5	5	<5	<5	<5	<5	0	<5	*	*
Poisoning	4	13	9	<5	15	5	<5	<5	9	0%	*
Strangulation	<5	<5	7	<5	7	<5	<5	9	5	0%	*
Drowning	0	<5	0	0	0	<5	0	0	0	0%	*
Firearms and explosives	534	577	610	691	747	647	629	649	640	27%	11 (NL)
Cutting or piercing	347	390	379	378	361	381	357	309	321	14%	-6 (NL)
Perpetrator of abuse	67	51	65	80	110	112	98	99	60	3%	*
Other and unspecified	807	894	934	868	869	904	840	841	729	31%	-10 (NL)
Late affects of injury by other person	17	19	36	29	25	29	23	24	21	1%	*

\*Suppressed due to less than 20 hospitalizations.  
Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 46a. Number of ED visits resulting from assaults by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	33,109	33,897	36,150	39,063	46,029	46,272	45,736	45,583	48,332
<b>Sex</b>									
Males	20,404	20,669	22,212	23,945	28,479	28,493	27,861	27,120	26,744
Females	12,705	13,228	13,938	15,118	17,550	17,779	17,875	18,463	21,588
<b>Age</b>									
< 1 yr	22	30	23	21	34	29	35	23	37
1-4 yrs	119	122	140	133	141	151	148	155	199
5-14 yrs	2,194	2,182	2,216	2,349	2,701	2,481	2,551	2,318	2,459
15-24 yrs	12,267	12,893	13,448	14,526	17,092	16,645	16,797	16,838	17,169
25-34 yrs	8,390	8,351	9,108	9,832	11,672	12,089	11,793	12,345	13,425
35-44 yrs	6,354	6,287	6,725	7,048	7,893	7,983	7,527	7,077	7,645
45-54 yrs	2,828	3,057	3,402	3,914	4,794	5,247	5,123	5,128	5,394
55-64 yrs	594	674	779	891	1,286	1,221	1,294	1,311	1,537
65-74 yrs	197	176	183	220	260	297	293	270	304
75-84 yrs	104	91	88	101	112	89	123	85	122
85 or older	40	34	38	28	44	40	52	33	41

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 46b. ED visit rates per 100,000 resulting from assaults by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	296	303	324	351	414	418	414	413	444	19.5
<b>Sex†</b>										
Males	365	237	398	429	511	512	502	489	488	25.7
Females	227	237	250	273	318	324	326	337	399	19.9
<b>Age</b>										
< 1 yr	15	20	15	14	23	19	23	16	27	0.9 (NL)
1-4 yrs	20	20	24	22	24	26	25	26	34	1.4
5-14 yrs	136	137	140	151	176	164	170	155	162	3.9
15-24 yrs	775	808	843	912	1,080	1,057	1,069	1,076	1,082	43.8
25-34 yrs	569	570	623	675	801	827	806	835	952	47.5
35-44 yrs	364	368	401	428	487	501	484	466	517	19.0
45-54 yrs	172	183	201	228	276	300	293	292	310	18.9
55-64 yrs	55	60	67	73	102	94	97	95	106	6.5
65-74 yrs	26	23	24	29	34	38	36	32	36	1.7
75-84 yrs	19	16	16	18	20	16	23	16	23	0.4
85 or older	21	17	19	14	20	18	23	15	18	NL

†Rates are age adjusted to the 2000 U.S. standard population  
 NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

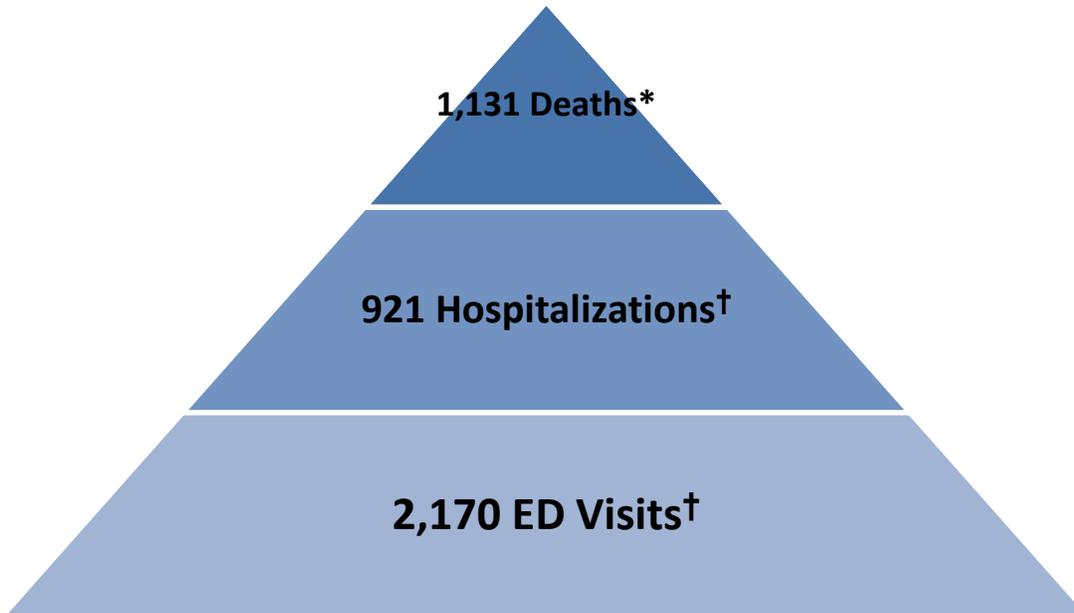
**Table 46c. Number of ED visit rates resulting from assaults by type and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Fight or brawl	16,826	17,309	18,279	19,429	22,141	22,316	22,343	20,982	20,668	42.8%	623
Rape	516	378	342	416	457	435	420	492	484	1.0%	6 (NL)
Corrosive substance	25	23	23	29	46	30	41	27	31	0.1%	1 (NL)
Poisoning	46	41	46	47	66	35	42	33	48	0.1%	-1 (NL)
Strangulation	41	68	64	67	101	106	88	99	143	0.3%	10
Drowning	<5	5	<5	0	<5	<5	<5	0	0	0.0%	*
Firearms and explosives	484	522	722	821	1,184	1,018	1,059	706	737	1.5%	41 (NL)
Cutting or piercing	1,829	1,862	1,981	2,103	2,493	2,449	2,159	2,009	2,009	4.2%	31 (NL)
Perpetrator of abuse	0	0	0	0	0	0	0	0	3,292	6.8%	*
Other and unspecified	12,988	13,161	14,054	15,169	18,470	18,917	18,708	20,395	20,072	41.5%	1052
Late affects of injury by other person	357	532	639	987	1,073	967	877	841	848	1.8%	56 (NL)

\*Suppressed due to small cell sizes.  
Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

## SECTION 4.3: FIREARMS



\*SOURCE: OHIO DEPARTMENT OF HEALTH, VITAL STATISTICS, 2010

† SOURCE: OHIO HOSPITAL ASSOCIATION

### CHAPTER HIGHLIGHTS:

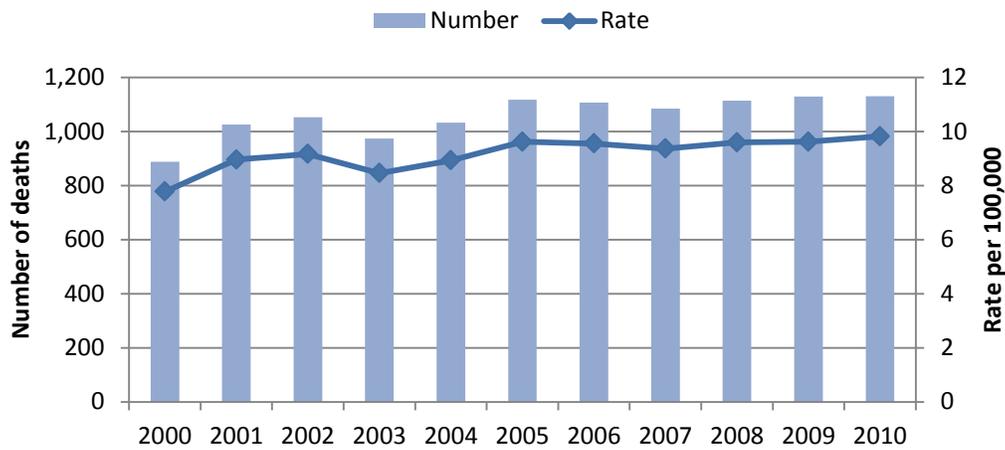
#### Patterns:

- 3 people die from a firearm fatality in Ohio each day.
- Males were more likely to experience a fatal or non-fatal injury than females.
- Blacks were 6 times more likely to die from a firearm related injury than whites.
- Highest rates of fatal and non-fatal injuries were found among persons age 15-34.
- Among households with a firearm, nearly one-half reported the firearm was in an unlocked location.

#### Trends:

- Firearm related fatalities increased 26 percent since 2000.
- Hospitalization and ED visit rates increased from 2002 to 2006 then decreased between 2006 and 2010.
- Fatal and non-fatal firearm injury rates were consistently higher among males and ages 15-34.
- Fatal injury rates were consistently higher among blacks compared to other race or ethnic groups.

**Figure 13.1. Number and age adjusted death rate for firearm related injuries by year, Ohio, 2002-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**DEATHS:**

In 2010, 1,131 people died from a firearm related injury in Ohio. The firearm related fatality rate was 9.8 per 100,000 (Figure 13.1). Males were 6 times more likely to die from a firearm related injury than females (17.6 per 100,000 versus 2.6 per 100,000). The age distribution of firearm related fatalities differed by sex. Among males, the highest rates were found among ages 25-34 and 85 or older. Among females, the highest rates were found ages 15-44 (Figure 13.2). The highest fatality rates were found among ages 25-34 (17 per 100,000) and 15-24 (13 per 100,000). Blacks (22 per 100,000) were 6 times more likely to die from a firearm related injury than whites (3.7 per 100,000). See Table 13.1 for a firearm death risk profile. Most firearm related deaths were associated with suicides (63 percent) and homicides (34 percent).

Table 13.1 Firearm Death Risk Profile		
	2010 At Risk Groups	Annual Trend since 2000
Overall		+26%
Sex	Males	Males (largest increase)
Age	25-34	25-34 (largest increase)
Race and ethnicity	Blacks	Blacks (largest increase)

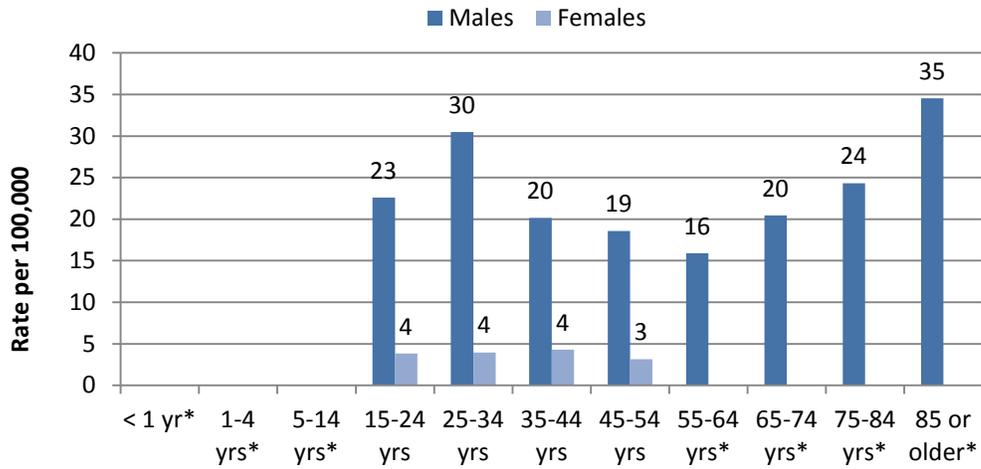
**TRENDS:**

Firearm related death rates increased 26 percent from 7.8 per 100,000 in 2000 and 9.8 per 100,000 in 2010. The average annual increase was 0.15 per 100,000 per year. Rates increased by an average of 0.2 per 100,000 per year among males while rates did not follow a consistent trend among females. The largest increases in rates were found among ages 25-34 (0.5 per 100,000 per year) and ages 35-44 (0.2 per 100,000 per year). A decrease in rates was found among older adults ages 75-84 (0.4 per 100,000 per year). Increases were found among both blacks and whites with a larger annual increase found among blacks (0.6 per 100,000 per year). The number of firearm related homicides increased by an average of 14 per year while the number of firearm

Ohio Violence and Injury Prevention Program, Ohio Department of Health

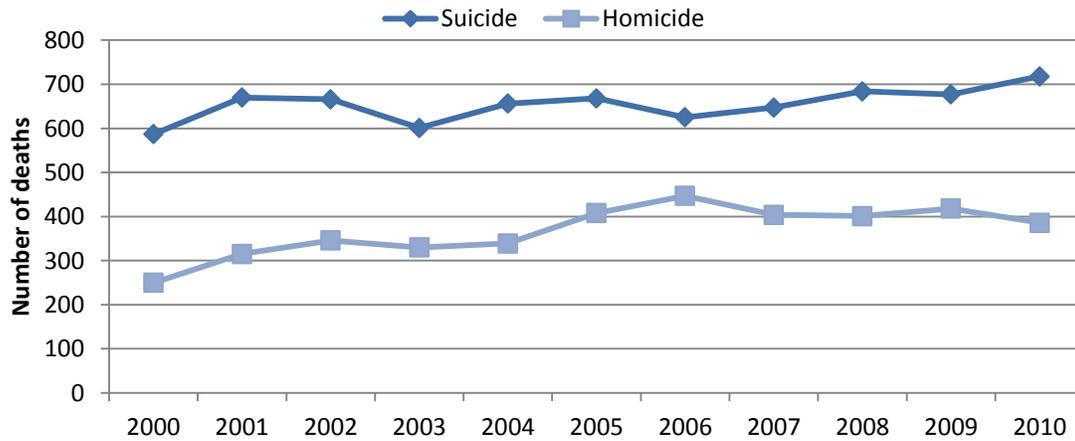
related suicides did not follow a consistent pattern (Figure 13.3). See Tables 48a-c located at the end of this section for more detailed information on firearm related deaths in Ohio.

**Figure 13.2. Firearm related fatality rates by age and sex, Ohio, 2010**



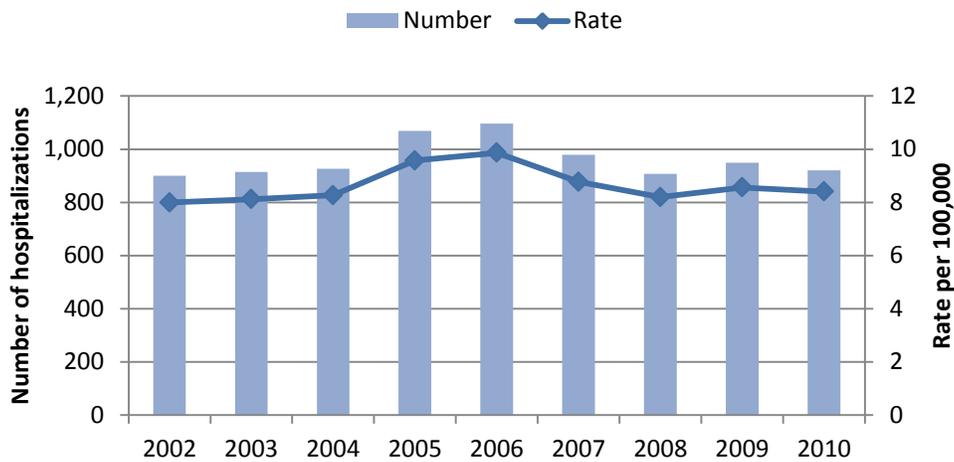
Source: Ohio Department of Health, Office of Vital Statistics  
 \*Data suppressed due to less than 20 deaths

**Figure 13.3. Number of firearm related deaths by intent and year, Ohio, 2000-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**Figure 13.4. Number and age adjusted rate for firearm related hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

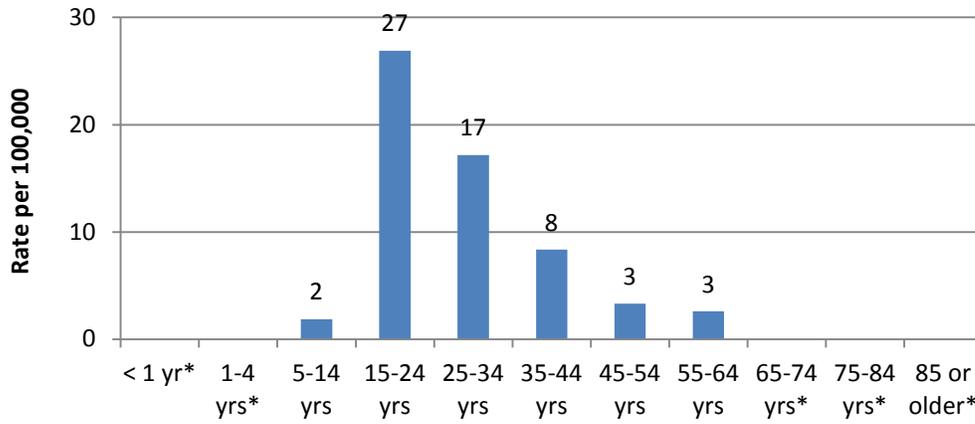
In 2010, approximately 900 hospitalizations were associated with firearms. The hospitalization rate was 8.4 per 100,000 (Figure 13.4). The rate was over 10 times higher among males (15.5 per 100,000) than females (1.4 per 100,000). Among males and females, the highest hospitalization rates were found among ages 15-24 (25 per 100,000) followed by ages 25-34 (18 per 100,000) (Figure 13.5). See Table 13.2 for an assault hospitalization risk profile. Approximately 68 percent of firearm related hospitalizations were associated with assaults and 20 percent were related to unintentional mechanisms (Figure 13.6).

Table 13.2 Assault Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend Since 2002
Overall		Increase then decrease
Sex	Males	Females (largest decrease)
Age	15-34	15-24 (largest increase)

**TRENDS:**

Rates of firearm related hospitalizations increased between 2002 and 2006 then decreased from 2006 to 2010. A slight decrease was found among females (-0.1 per 100,000 per year) while rates among males did not follow a consistent pattern. An increase in rates was found among ages 25-34 (0.3 per 100,000 per year) while rates among other age groups did not follow a consistent trend over time. The distribution of assault related hospitalizations by mechanism remained the same throughout the study period. See Tables 49a-c located at the end of this section for more detailed information about assault related hospitalizations in Ohio.

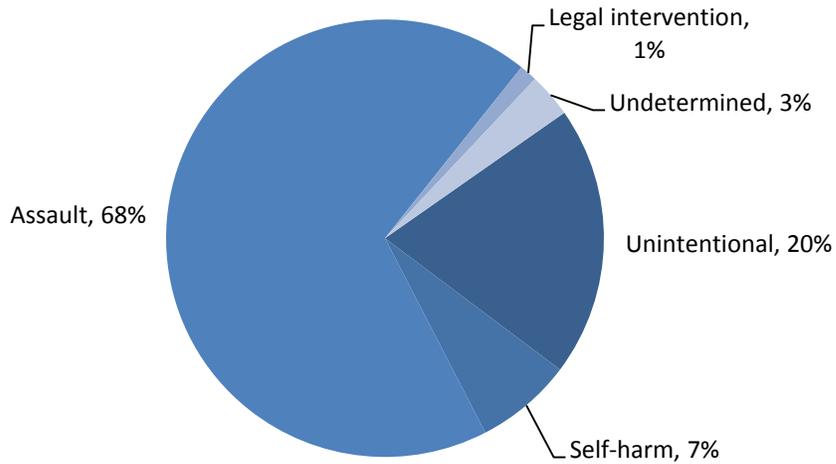
**Figure 13.5. Hospitalization rates for firearm related injuries by age, Ohio, 2010**



Source: Ohio Hospital Association

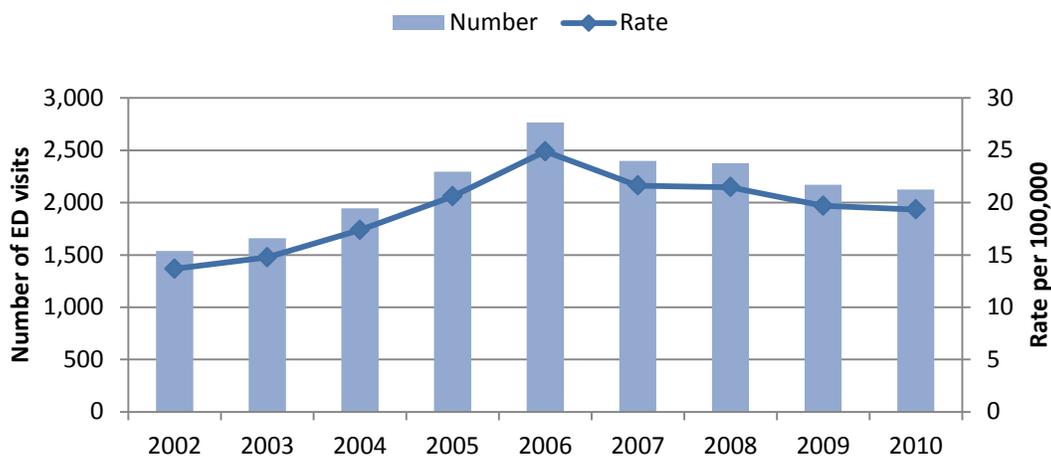
\*Rates suppressed due to less than 20 hospitalizations

**Figure 13.6. Percentage of hospitalizations resulting from assaults, by intent, Ohio, 2010**



Source: Ohio Hospital Association

**Figure 13.7. Number and age adjusted rate for firearm related ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

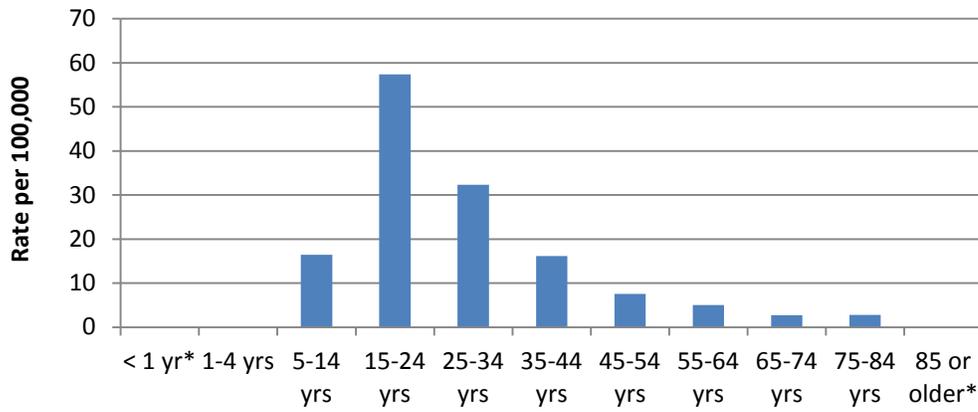
Approximately 2,100 ED visits were associated with firearms in 2010. The ED visit rate was 19.3 per 100,000 (Figure 13.7). Males were 7 times more likely than females to visit the ED for a firearm related injury. For both males and females, ED visits increased from birth through age 24 and then steadily decreased after age 25 (Figure 13.8). The highest rates occurred among ages 15-24. See Table 13.3 for a firearm ED visit risk profile. Over half of ED visits were associated with unintentional mechanisms (58 percent) and 31 percent resulted from assaults.

Table 13.3 Firearm ED Visit Risk Profile		
	2010 At Risk Groups	Annual trend since 2002
Overall		Increase then decrease
Sex	Males	Females (largest increase)
Age	15-24	Inconsistent trends

**TRENDS:**

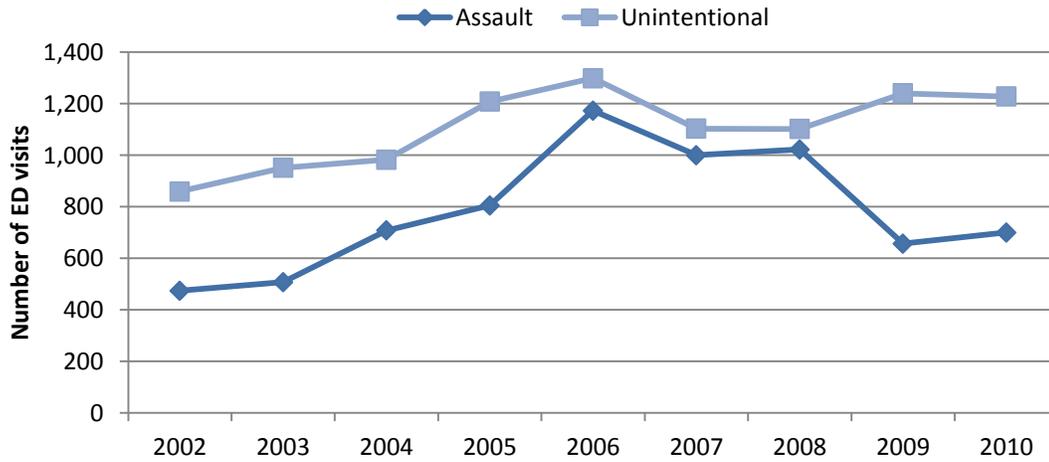
ED visit rates resulting from firearm related injuries increased between 2002 and 2006 then decreased from 2007 to 2010. Rates among females increased slightly (0.2 per 100,000 per year) while rates among males did not follow consistent trend. Rates did not follow a consistent trend among any age group. The number of ED visits associated unintentional mechanisms increased by an average of 41 per year while the number of ED visits resulting from assaults increased in 2002-2006 and then decreased in 2007-2010 (Figure 13.9). See Tables 50a-c located at the end of this section for more detailed information on self-harm related ED visits.

**Figure 13.8. ED visit rates resulting from firearm injuries by age and sex, Ohio, 2010**



Source: Ohio Hospital Association  
 \*Suppressed due to small cell sizes

**Figure 13.9. Number of ED visits resulting from firearm injuries, by intent and year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**FIREARMS AND STORAGE PRACTICES IN HOMES:**

According to the results from the Behavioral Risk Factor Surveillance System, an estimated 1.7 million or 37 percent of households in Ohio reported a firearm in their home. Males were more likely to report a firearm in their home than females (43 percent versus 31 percent). Respondents from households above the federal poverty level (39 percent) were more likely to report a firearm in their home than respondents below the poverty level (25 percent). Respondents from suburban (40 percent), rural (44 percent) or Appalachian (53 percent) counties were more likely to have a firearm in their home compared to respondents from households from metropolitan (28 percent) counties. The percentage of respondents with a firearm in their home was similar across all age groups (Table 13.4). See Tables 51a for more detailed information on the percentage of adults who reported a firearm in their home.

Table 13.4 Firearm Storage Risk Profile		
	Firearm in home	Unlocked firearm in home
Overall	1.7 million*	800,000*
Sex	Males	Males
Age	Similar for all ages	45 or older
Household income	Above poverty	Similar for all income levels
Economic development	Rural and Appalachian	Similar for all county groups
*Households in Ohio		

Among households with a firearm, nearly 800,000 or one-half (46 percent) reported their firearm was in an unlocked location. Males were more likely to report an unlocked firearm in their home than females (50 percent versus 40 percent). Adults ages 45 or older were more likely report unlocked firearms in their home than adults less than 45 years of age. No differences were found by poverty levels or county economic development level (Table 13.4). See Table 51b located at the end of this section for more detailed information on the percentage of adults who reported an unlocked firearm in their home.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 48a. Number of deaths resulting from firearms, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	888	1,026	1,053	974	1,033	1,118	1,107	1,085	1,114	1,129	1,131
<b>Sex</b>											
Males	763	894	922	868	885	983	957	959	989	971	983
Females	125	132	131	106	148	135	150	126	125	158	148
<b>Age</b>											
< 1 yr	0	0	0	<5	0	0	0	0	0	<5	0
1-4 yrs	0	<5	<5	<5	0	<5	<5	<5	<5	7	<5
5-14 yrs	19	11	11	6	8	17	16	10	7	13	7
15-24 yrs	155	193	203	208	206	224	229	226	226	211	212
25-34 yrs	164	188	199	211	204	209	242	222	227	219	242
35-44 yrs	166	195	188	153	167	176	168	183	188	170	180
45-54 yrs	140	165	159	152	191	198	193	194	181	206	187
55-64 yrs	74	98	98	95	98	124	109	109	127	149	128
65-74 yrs	69	76	89	65	79	65	58	63	84	73	86
75-84 yrs	75	74	79	62	65	75	68	58	55	54	60
85 or older	26	24	26	19	15	27	21	17	18	26	25
<b>Race and ethnicity</b>											
White‡	676	747	767	686	744	762	739	736	748	775	785
Black‡	201	260	256	269	260	326	341	326	332	328	320
Hispanic	5	12	15	13	24	23	20	14	26	23	17
Other‡	<5	7	6	<5	<5	<5	5	8	7	<5	8

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 48b. Death rates per 100,000 resulting from firearms, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	7.8	9.0	9.2	8.5	8.9	9.6	9.6	9.4	9.6	9.6	9.8	0.15
<b>Sex†</b>												
Males	14.3	16.5	17.0	15.7	16.0	17.6	17.1	17.1	17.6	17.1	17.6	0.22
Females	2.1	2.3	2.2	1.8	2.5	2.3	2.6	2.1	2.1	2.7	2.6	0.04 (NL)
<b>Age</b>												
< 1 yr	*	*	*	*	*	*	*	*	*	*	*	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*	*	*
5-14 yrs	*	*	*	*	*	*	*	*	*	*	*	*
15-24 yrs	10.0	12.3	12.8	13.1	13.0	14.1	14.5	14.4	14.4	13.5	13.4	0.28 (NL)
25-34 yrs	10.8	12.6	13.4	14.3	13.8	14.2	16.5	15.1	15.4	14.8	17.2	0.46
35-44 yrs	9.2	11.0	10.8	9.0	10.0	10.7	10.3	11.4	12.0	11.2	12.2	0.23
45-54 yrs	8.9	10.1	9.7	9.1	11.3	11.5	11.1	11.1	10.3	11.7	10.7	0.20 (NL)
55-64 yrs	7.3	9.6	9.0	8.4	8.4	10.2	8.6	8.4	9.5	10.8	8.8	0.13 (NL)
65-74 yrs	8.8	9.7	11.5	8.4	10.3	8.5	7.5	8.0	10.3	8.7	10.1	-0.04 (NL)
75-84 yrs	13.8	13.5	14.2	11.1	11.6	13.4	12.2	10.5	10.0	10.0	11.1	-0.37
85 or older	14.6	13.3	14.1	*	*	13.6	10.2	*	*	11.5	10.9	-0.5 (NL)
<b>Race and ethnicity†</b>												
White‡	2.1	2.8	2.7	2.9	2.8	3.6	3.8	3.6	3.7	3.6	3.7	0.15
Black‡	15.1	19.2	18.7	19.4	18.4	22.7	23.8	22.5	22.9	22.5	21.7	0.64
Hispanic	*	*	*	*	8.3	8.9	6.2	*	8.4	8.6	*	*
Other‡	*	*	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to fewer than 20 deaths.

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

**Table 48c. Number of deaths resulting from firearms, by intent and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Unintentional	33	25	19	18	19	26	23	17	12	13	8	1%	*
Suicide	587	670	666	601	656	668	625	647	684	677	718	63%	7 (NL)
Homicide	250	315	346	330	339	408	447	404	401	418	386	34%	14
Undetermined	11	8	12	11	10	5	5	9	9	9	10	1%	*
Legal intervention	7	8	10	14	9	11	7	8	8	12	9	1%	*

\*Trends suppressed due to fewer than 20 deaths.

Source: Ohio Department of Health, Office of Vital Statistics

NL: Interpret with caution because trend does not follow linear pattern

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 49a. Number of hospitalizations resulting from firearms by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	900	915	926	1,069	1,096	979	907	949	921
<b>Sex</b>									
Males	804	820	826	966	996	904	824	877	846
Females	96	95	100	103	100	75	83	72	75
<b>Age</b>									
< 1 yr	0	0	<5	0	0	0	0	<5	0
1-4 yrs	<5	<5	<5	<5	6	<5	<5	<5	<5
5-14 yrs	18	18	23	28	45	33	23	28	15
15-24 yrs	348	394	381	477	465	424	401	421	400
25-34 yrs	262	241	267	276	301	242	223	254	250
35-44 yrs	129	132	138	166	157	136	138	127	130
45-54 yrs	83	82	82	75	75	90	68	58	80
55-64 yrs	21	24	22	24	26	34	24	36	24
65-74 yrs	14	9	9	14	8	10	20	12	13
75-84 yrs	13	10	<5	7	10	5	5	8	<5
85 or older	9	<5	0	<5	<5	<5	<5	<5	<5

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 49b. Hospitalization rates per 100,000 resulting from firearms by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	8.0	8.1	8.3	9.6	9.9	8.8	8.2	8.6	8.4	0.03 (NL)
<b>Sex†</b>										
Males	14.5	14.6	15.1	17.3	17.9	16.2	14.9	15.8	15.5	0.1 (NL)
Females	1.69	1.67	1.75	1.84	1.77	1.35	1.49	1.27	1.37	-0.06
<b>Age</b>										
< 1 yr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	*
1-4 yrs	*	*	*	*	*	*	*	*	*	*
5-14 yrs	*	*	1.5	1.8	2.9	2.2	1.5	1.9	*	*
15-24 yrs	22.0	24.7	23.9	29.9	29.4	26.9	25.5	26.9	25.2	0.33 (NL)
25-34 yrs	17.8	16.4	18.3	18.9	20.7	16.6	15.2	17.2	17.7	-0.11 (NL)
35-44 yrs	7.4	7.7	8.2	10.1	9.7	8.5	8.9	8.4	8.8	0.12 (NL)
45-54 yrs	5.0	4.9	4.8	4.4	4.3	5.1	3.9	3.3	4.6	-0.13 (NL)
55-64 yrs	1.9	2.1	1.9	2.0	2.1	2.6	1.8	2.6	1.7	0.01 (NL)
65-74 yrs	*	*	*	*	*	*	2	*	*	*
75-84 yrs	*	*	*	*	*	*	*	*	*	*
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 hospitalizations

†Rates are age adjusted to 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear trend pattern

Source: Ohio Hospital Association

**Table 49c. Number of hospitalizations resulting from firearms by intent and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Unintentional	202	195	173	197	205	200	172	203	184	20%	-1 (NL)
Self-harm	86	76	74	61	69	72	63	71	66	7%	-2 (NL)
Assault	528	561	601	685	729	640	619	630	629	68%	10 (NL)
Legal intervention	9	16	13	18	8	13	16	9	12	*	*
Undetermined	75	67	65	108	85	55	37	36	30	3%	-6 (NL)

\*Suppressed due to less than 20 hospitalizations

NL: Interpret with caution because trend does not follow linear trend pattern

Source: Ohio Hospital Association

*Burden of Injury in Ohio, 2000-2010*

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 50a. Number of ED visits resulting from firearms by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	1,538	1,661	1,946	2,296	2,766	2,398	2,377	2,170	2,125
<b>Sex</b>									
Males	1,371	1,467	1,713	2,019	2,457	2,122	2,106	1,934	1,831
Females	167	194	233	277	309	276	271	236	294
<b>Age</b>									
< 1 yr	0	0	<5	<5	<5	<5	0	<5	0
1-4 yrs	12	8	13	11	9	7	22	11	16
5-14 yrs	217	246	264	281	341	239	285	274	250
15-24 yrs	589	666	781	996	1,238	1,037	1,041	898	911
25-34 yrs	313	336	430	474	594	528	483	493	456
35-44 yrs	206	201	240	294	300	297	252	244	239
45-54 yrs	103	107	135	150	153	172	181	126	132
55-64 yrs	35	60	49	48	64	63	61	68	73
65-74 yrs	26	24	20	27	36	24	30	24	23
75-84 yrs	23	10	10	9	20	20	13	22	15
85 or older	14	<5	<5	<5	10	10	9	9	10

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 50b. ED visit rates per 100,000 resulting from firearms by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	13.7	14.8	17.4	20.6	24.9	21.6	21.5	19.7	19.3	0.78 (NL)
<b>Sex†</b>										
Males	24.6	26.1	30.6	36.1	44.1	38.1	37.9	35.0	33.3	1.33 (NL)
Females	3.0	3.4	4.2	5.0	5.6	5.1	4.9	4.3	5.4	0.2
<b>Age</b>										
< 1 yr	0.0	0.0	*	*	*	*	0.0	*	0.0	*
1-4 yrs	*	*	*	*	*	*	3.7	*	*	*
5-14 yrs	13.4	15.4	16.7	18.1	22.2	15.8	19.0	18.3	16.4	0.39 (NL)
15-24 yrs	37.2	41.8	48.9	62.5	78.3	65.9	66.2	57.4	57.4	2.76 (NL)
25-34 yrs	21.2	22.9	29.4	32.5	40.8	36.1	33.0	33.4	32.3	1.44 (NL)
35-44 yrs	11.8	11.8	14.3	17.8	18.5	18.6	16.2	16.1	16.2	0.58 (NL)
45-54 yrs	6.3	6.4	8.0	8.7	8.8	9.8	10.3	7.2	7.6	0.22 (NL)
55-64 yrs	3.2	5.3	4.2	4.0	5.1	4.9	4.6	4.9	5.0	0.13 (NL)
65-74 yrs	3.4	3.1	2.6	3.5	4.7	3.1	3.7	2.9	2.7	-0.03 (NL)
75-84 yrs	4.2	*	*	*	3.6	3.7	*	4.1	2.8	*
85 or older	*	*	*	*	*	*	*	*	*	*

\*Rates suppressed due to less than 20 ED visits

†Rates are age adjusted to the 2000 U.S. standard population

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 50c. Number of ED visits resulting from firearms by intent and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Assault	474	507	708	805	1,173	1,000	1,022	657	700	31%	36 (NL)
Legal intervention	23	25	24	36	46	25	33	57	36	3%	3 (NL)
Suicide	73	56	74	68	73	83	54	69	80	3%	1 NL
Undetermined	112	122	157	179	176	187	167	147	81	7%	<-1 (NL)
Unintentional	859	951	983	1,208	1,299	1,103	1,102	1,240	1,228	58%	41

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Table 51a. Percentage of respondents who reported a firearm in their home, Ohio, 2010\***

	<b>N</b>	<b>Percent</b>	<b>95% CI</b>
Overall	1,838	36.6	(34.8-38.4)
<b>Sex</b>			
Male	903	43.2	(40.2-46.3)
Female	935	30.7	(28.6-32.8)
<b>Age</b>			
18-24 yrs	30	32.6	(21.3-44.0)
25-34 yrs	124	32.6	(27.1-38.0)
35-44 yrs	275	38.7	(34.5-43.0)
45-54 yrs	398	37.2	(33.8-40.7)
55-64 yrs	478	38.8	(35.6-42.1)
65 or older yrs	533	35.5	(32.6-38.3)
<b>Household Poverty Status</b>			
Below poverty	97	24.7	(18.9-30.4)
Above poverty < 200%	307	34.9	(30.8-39.0)
Above poverty ≥ 200%	1,239	39.9	(37.6-42.2)
Missing household income	194	32.5	(26.9-38.0)
<b>County Urbanality</b>			
Metropolitan	909	28.4	(26.2-30.7)
Suburban	344	39.8	(35.4-44.2)
Rural	228	43.7	(38.4-49.0)
Appalachian	340	52.5	(47.5-57.5)

\*Source: Behavioral Risk Factor Surveillance System (BRFSS)

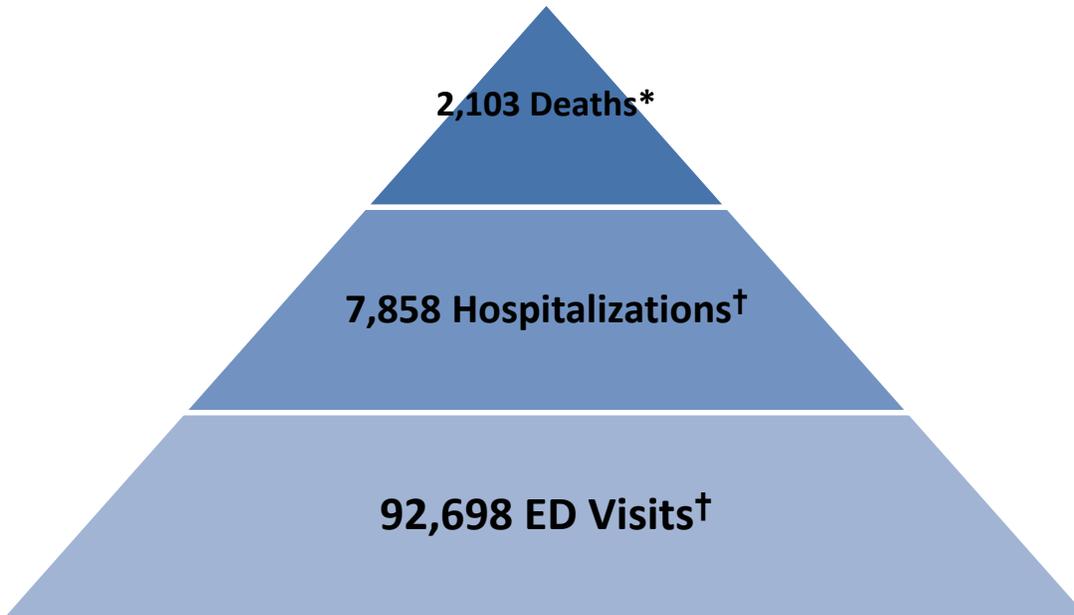
**Table 51b. Percentage of respondents who reported an unlocked firearm in their home among those who have a firearm, Ohio, 2010**

	<b>N</b>	<b>Percent</b>	<b>95% CI</b>
Overall	903	45.8	(42.6-48.9)
<b>Sex</b>			
Male	500	50.3	(45.7-55.0)
Female	403	39.9	(35.8-44.0)
<b>Age</b>			
18-24 yrs	10	+	(7.8-44.9)
25-34 yrs	52	43.6	(33.3-53.8)
35-44 yrs	98	37.0	(29.9-44.1)
45-54 yrs	197	50.9	(44.9-56.9)
55-64 yrs	249	51.6	(46.0-57.1)
65 or older yrs	297	55.7	(50.4-61.1)
<b>Household Poverty Status</b>			
Below poverty	38	38.9	(25.4-52.4)
Above poverty < 200%	143	43.5	(36.0-51.0)
Above poverty ≥ 200%	627	46.9	(43.1-50.7)
Missing household income	95	47.7	(36.7-58.7)
<b>County Urbanality</b>			
Metropolitan	438	45.2	(40.5-49.9)
Suburban	179	47.5	(40.3-54.7)
Rural	109	46.0	(37.6-54.5)
Appalachian	169	43.5	(37.0-49.9)

\*Source: Behavioral Risk Factor Surveillance System (BRFSS)

+Suppressed due to less than 20 respondents

## SECTION 5: TRAUMATIC BRAIN INJURIES (TBIs)



### CHAPTER HIGHLIGHTS:

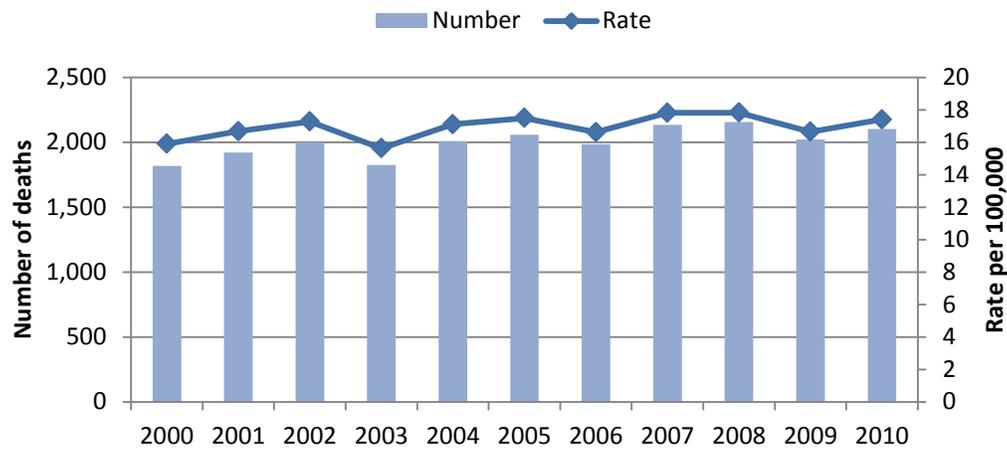
#### Patterns:

- Males were more likely to experience fatal and non-fatal TBI than females.
- Highest rates of fatal and non-fatal TBIs were found among ages 85 or older.
- Falls were the most common causes of fatal and non-fatal TBIs.

#### Trends:

- Rates of fatal TBIs did not change over time.
- TBI related hospitalizations increased from 2002-2007 then decreased from 2007-2010.
- ED visit rates increased 78 percent in 2002-2010.
- Largest increases in fatal and non-fatal TBI rates were found among adults ages 85 or older.
- Fatal and non-fatal fall related TBI rates have increased while motor vehicle traffic crash related TBI rates have decreased.

**Figure 14.1. Number and age adjusted death rate for traumatic brain injuries by year, Ohio, 2000-2010**



Source: Ohio Department of Health, Vital Statistics

**DEATHS:**

Approximately 2,100 Ohioans died from a traumatic brain injury (TBI) in 2010. The death rate was 17.4 per 100,000 (Figure 14.1). Rates were 3 times higher among males (27.4 per 100,000) than females (8.7 per 100,000). Among both males and females, the highest rates of deaths occurred among adults ages 75 or older (Figure 14.2). The highest rates of TBI deaths occurred among blacks (19.4 per 100,000) followed by whites (17.0 per 100,000), other races (12.1 per 100,000) and Hispanics (11.6 per 100,000). See Table 14.1 for TBI risk profile. The most common mechanisms associated with TBI deaths were falls (28 percent), suicides (27 percent), motor vehicle traffic crashes (21 percent), and homicides (10 percent).

Table 14.1 Traumatic Brain Injury Death Risk Profile		
	2010 At Risk Groups	Annual Trend since 2000
Overall		Inconsistent trend
Sex	Males	Inconsistent trend
Age	75 or older	85 or older (largest increase)
Race and ethnicity	Blacks	Inconsistent trends

**TRENDS:**

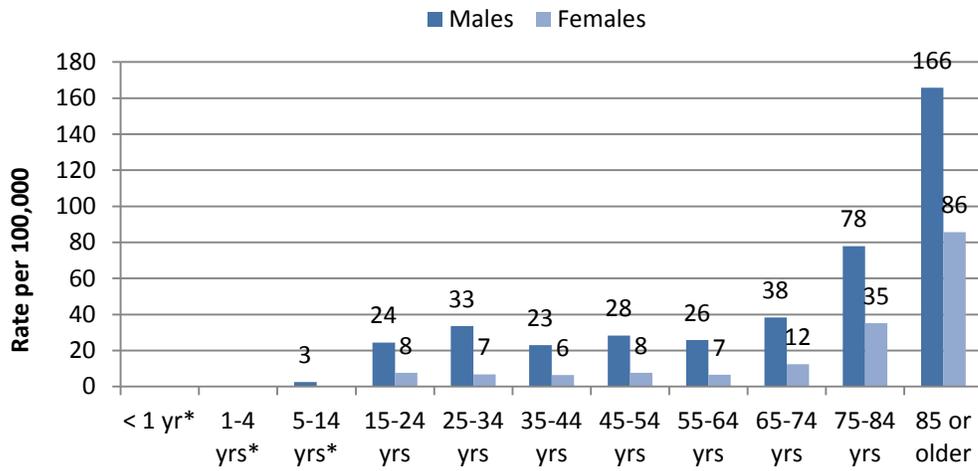
TBI death rates did not follow a consistent linear trend over the study period. Inconsistent trends were also found among males, females, all race and ethnic groups. Consistent trends were found among some age groups with the largest increases found among older adults. Rates increased on average by 5 deaths per 100,000 per year among adults ages 85 or older and 1 death per 100,000 per year among ages 75-84. The number of TBI deaths associated with falls (37 per year) and suicide (10 per year) increased while the number of deaths associated with motor vehicle traffic crashes decreased (-20 per year) (Figure 14.3). See Tables 52a-

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

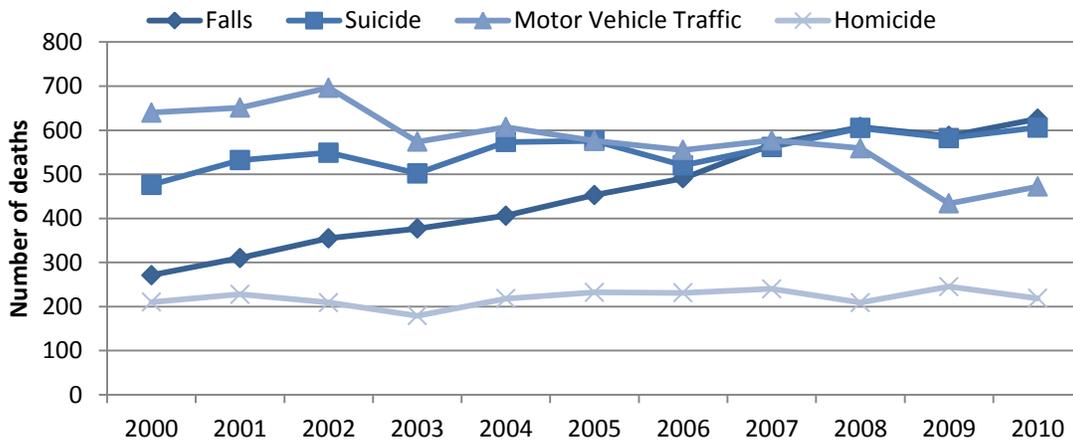
located at the end of this section for more detailed information on the number and rate of TBI deaths in Ohio.

**Figure 14.2. Traumatic brain injury fatality rates by age and sex, Ohio, 2010**



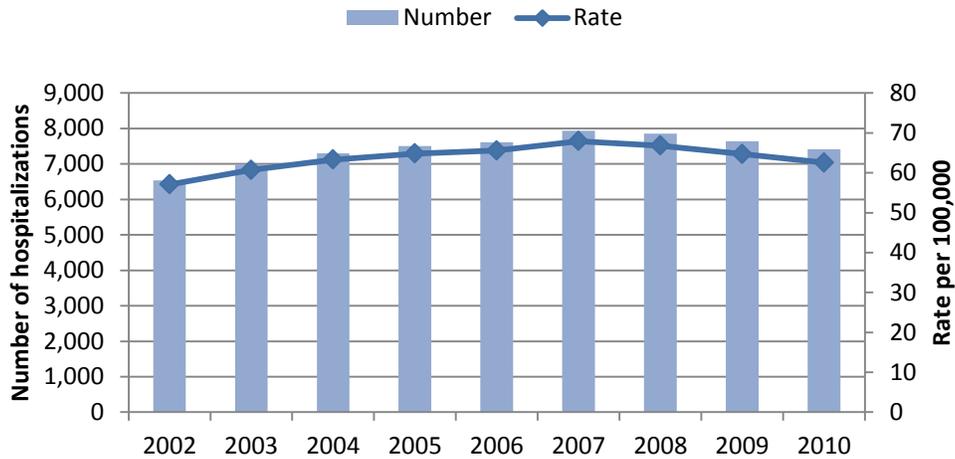
Source: Ohio Department of Health, Office of Vital Statistics  
 \*Data suppressed due to less than 20 deaths

**Figure 14.3. Number of traumatic brain injury deaths by mechanism and year, Ohio, 2000-2010**



Source: Ohio Department of Health, Office of Vital Statistics

**Figure 14.4. Number and age adjusted rate for traumatic brain injury related hospitalizations by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**HOSPITALIZATIONS:**

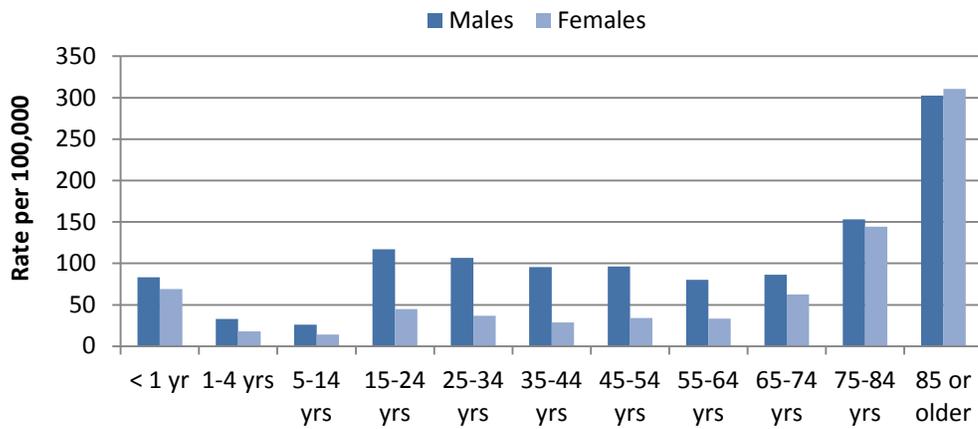
In 2010, approximately 7,900 hospitalizations were associated with traumatic brain injuries (TBI). The hospitalization rate was 62.5 per 100,000 (Figure 14.4). The rate was 2 times higher among males (90 per 100,000) than females (43 per 100,000). For both males and females, the highest hospitalization rates were found among ages 75 or older (Figure 14.5). See Table 14.2 for a TBI hospitalization risk profile. The most common mechanisms associated with TBI were falls (26 percent) and motor vehicle crashes (21 percent). In addition, 40 percent of hospitalizations did not have external cause of injury listed.

Table 14.2 TBI Hospitalization Risk Profile		
	2010 At Risk Groups	Annual Trend Since 2002
Overall		Increased then decreased
Sex	Males	Increased then decreased
Age	75 or older	85 or older (largest increase)

**TRENDS:**

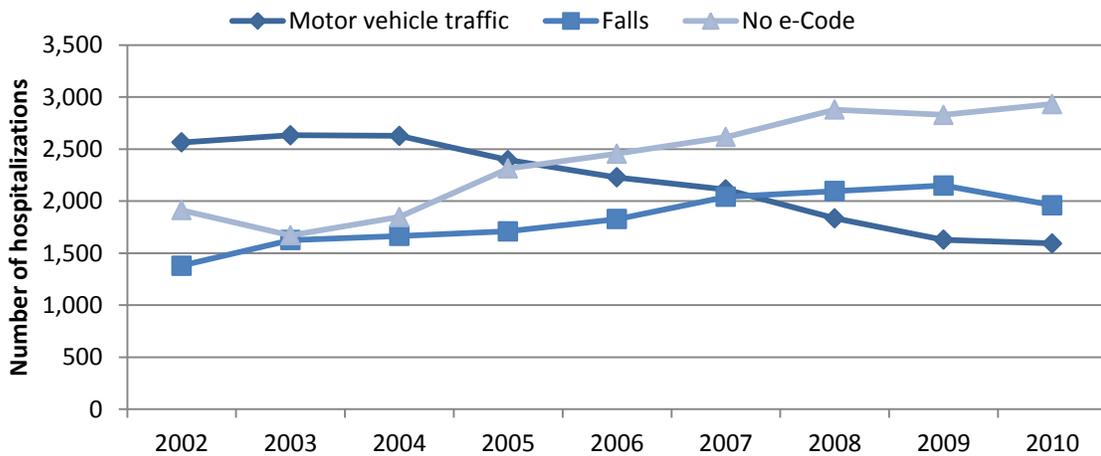
Hospitalization rates appeared to increase in 2002-2007 then decrease in 2007-2010. Rates among males followed the same pattern while rates among females increased in 2002-2008 then decreased in 2008-2010. Trend patterns varied by age group. A decrease in rates was found among ages 5-14 (1 per 100,000 per year) and ages 15-24 (2 per 100,000 per year) while an increase was found among ages 45 or older. The largest annual increase was found among adults ages 85 or older (14 per 100,000 per year). The mechanisms of TBI related hospitalizations shifted between 2002 and 2010. The number of hospitalizations associated with motor vehicle traffic crashes decreased by 146 per year while the number of hospitalizations associated with falls and without an external cause of injury code increased by 85 per year and 165 per year, respectively (Figure 14.6). See Tables 53a-c located at the end of this section for more detailed information about TBI related hospitalizations in Ohio.

**Figure 14.5. Hospitalization rates for traumatic brain injuries by sex and age, Ohio, 2010**



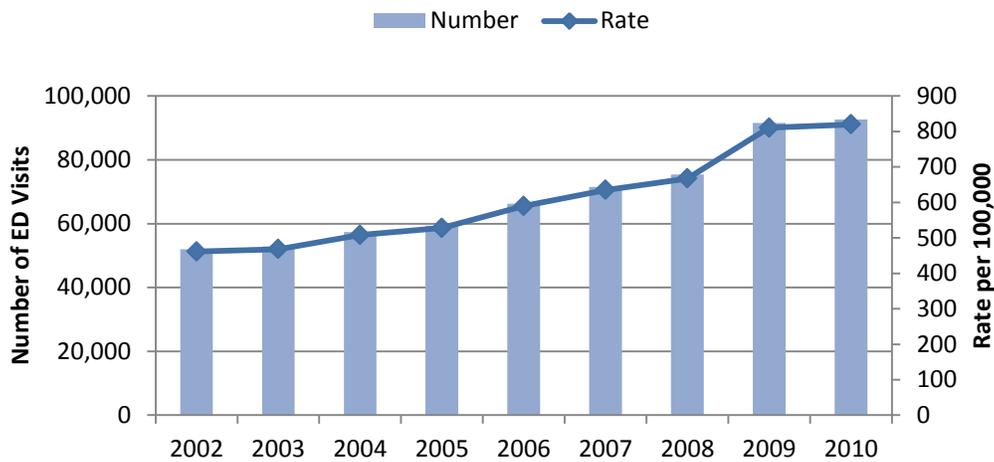
Source: Ohio Hospital Association

**Figure 14.6. Number of hospitalizations resulting from traumatic brain injuries, by mechanism and year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**Figure 14.7. Number and age adjusted rate for traumatic brain injury related ED visits by year, Ohio, 2002-2010**



Source: Ohio Hospital Association

**EMERGENCY DEPARTMENT VISITS:**

Nearly 93,000 emergency department (ED) visits were associated with traumatic brain injuries (TBI) in 2010. The ED visit rate was 820 per 100,000 (Figure 14.7). Overall, males were more likely to experience a TBI related ED visit than females (886 versus 747 per 100,000). However, this pattern changed by age group. Among ages 54 or younger, ED visit rates were higher among males compared to females while rates were higher among females compared to males among ages 55 or older. For both males and females, TBI related ED visits followed a bimodal age distribution with the highest rates of ED visits found among infants less than 1 year of age and adults ages 85 or older (Figure 14.8). See Table 14.3 for TBI ED visit risk profile. The most common mechanisms associated with ED visits were falls (36 percent), being struck by or against (14 percent), and motor vehicle traffic crashes (11 percent). In addition, 23 percent of TBI related ED visits did not have an external cause of injury code.

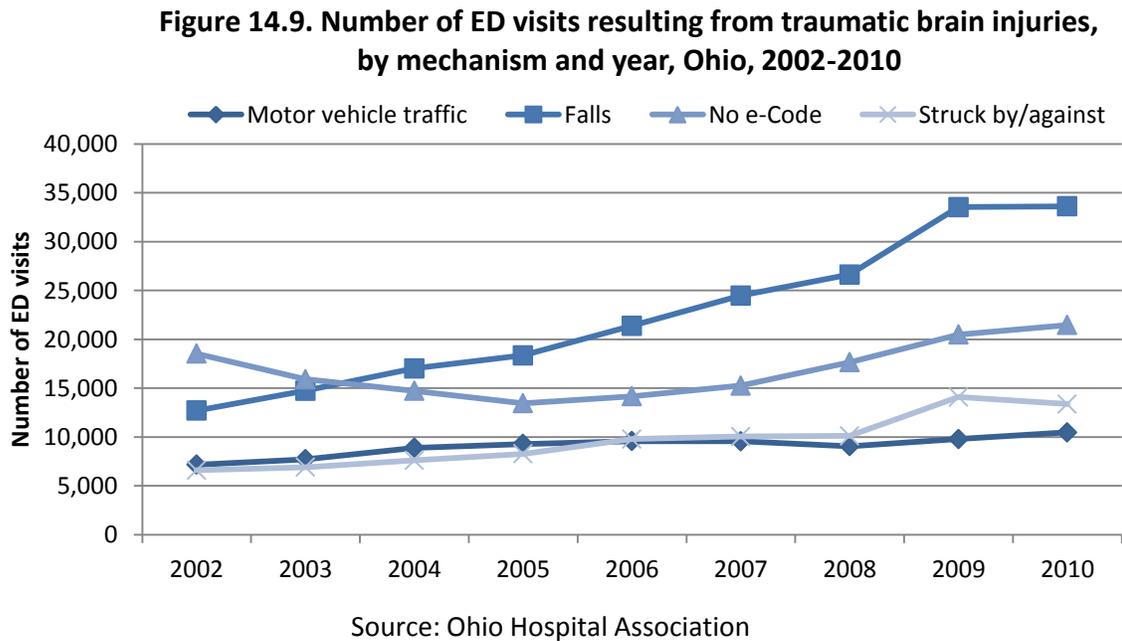
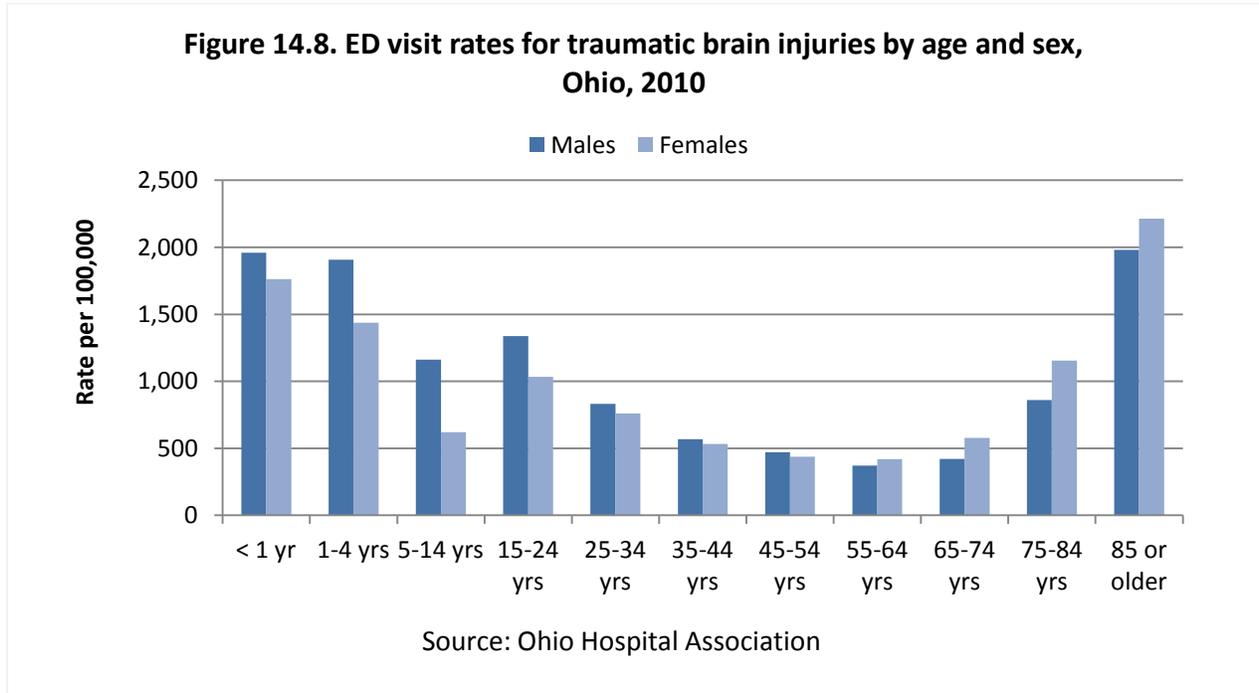
Table 14.3 TBI ED Visit Risk Profile		
	2010 At Risk Groups	Annual Trend Since 2002
Overall		+78%
Sex	Males	Similar for males and females
Age	85 or older	85 or older (largest increase)

**TRENDS:**

Rates of TBI related ED visits increased 78 percent from 461 per 100,000 in 2002 to 820 per 100,000 in 2010. The average annual increase was 53 per 100,000 per year. The increase in rates was similar for both males and females. Rates increased among all age groups with the largest increase found among adults ages 85 or older (180 per 100,000 per year). The distribution of ED visits by mechanism shifted during the study period. Increases in the number of ED visits were found among falls (2,755 per year), being struck by or against (927 per year), sports or recreation activities (360 per year) and motor vehicle traffic crashes (334 per year) (Figure

Ohio Violence and Injury Prevention Program, Ohio Department of Health

14.9). The number of ED visits without an external cause code appeared to decrease in 2002-2005 then increase in 2005-2010. See Tables 54a-c located at the end of this section for more detailed information on the number and rate of TBI related ED visits.



**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 52a. Number of deaths resulting from traumatic brain injuries, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Overall	1,818	1,921	1,999	1,825	2,009	2,060	1,986	2,136	2,156	2,022
<b>Sex</b>										
Males	1,331	1,420	1,471	1,309	1,488	1,512	1,420	1,569	1,581	1,491
Females	487	501	528	516	521	548	566	567	575	531
<b>Age</b>										
< 1 yr	6.0	8.5	6.8	6.8	6.7	6.8	6.1	7.3	10.1	10.1
1-4 yrs	4.3	4.7	3.5	4.5	2.8	3.9	2.2	4.4	4.1	4.7
5-14 yrs	4.5	3.1	3.5	2.1	2.7	3.2	3.0	1.7	2.1	2.1
15-24 yrs	21.8	20.8	20.3	19.0	22.3	17.9	19.3	20.9	17.1	15.4
25-34 yrs	16.5	17.1	18.5	16.1	17.2	18.3	17.4	17.4	18.1	15.4
35-44 yrs	16.4	16.6	16.8	13.7	14.8	17.1	11.8	15.5	15.3	15.5
45-54 yrs	12.9	16.7	17.4	14.4	18.1	17.9	17.7	17.5	18.1	17.5
55-64 yrs	13.8	16.4	15.2	15.4	17.1	17.8	16.3	17.4	18.3	17.7
65-74 yrs	19.0	19.5	22.9	20.2	21.8	22.8	22.2	23.9	23.9	21.4
75-84 yrs	38.0	43.7	40.7	40.9	47.1	48.3	48.4	49.8	52.9	48.4
85 or older	70.9	65.7	91.5	95.2	74.3	86.9	102.5	113.4	119.4	110.6
<b>Race and ethnicity</b>										
White‡	270	253	250	234	270	206	215	244	188	180
Black‡	6	9	7	5	5	8	5	8	12	9
Hispanic	14	20	12	19	15	14	8	18	17	17
Other‡	63	36	41	24	33	42	36	20	24	22

‡Non-Hispanic

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 52b. Death rates per 100,000 resulting from traumatic brain injuries, by year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	15.9	16.7	17.3	15.6	17.1	17.5	16.6	17.8	17.8	16.6	17.4	0.12 (NL)
<b>Sex†</b>												
Males	25.2	26.7	27.8	24.6	27.3	27.8	25.9	28.6	28.8	26.9	27.1	0.18 (NL)
Females	7.8	8.0	8.4	8.0	8.1	8.4	8.4	8.4	8.4	7.8	8.7	0.04 (NL)
<b>Age</b>												
< 1 yr	6.0	8.5	6.8	6.8	6.7	6.8	6.1	7.3	10.1	10.1	12.2	0.44
1-4 yrs	4.3	4.7	3.5	4.5	2.8	3.9	2.2	4.4	4.1	4.7	4.3	0.01 (NL)
5-14 yrs	4.5	3.1	3.5	2.1	2.7	3.2	3.0	1.7	2.1	2.1	1.4	-0.22
15-24 yrs	21.8	20.8	20.3	19.0	22.3	17.9	19.3	20.9	17.1	15.4	16.1	-0.54
25-34 yrs	16.5	17.1	18.5	16.1	17.2	18.3	17.4	17.4	18.1	15.4	20.0	0.12 (NL)
35-44 yrs	16.4	16.6	16.8	13.7	14.8	17.1	11.8	15.5	15.3	15.5	14.6	-0.16 (NL)
45-54 yrs	12.9	16.7	17.4	14.4	18.1	17.9	17.7	17.5	18.1	17.5	17.8	0.32 (NL)
55-64 yrs	13.8	16.4	15.2	15.4	17.1	17.8	16.3	17.4	18.3	17.7	15.9	0.25 (NL)
65-74 yrs	19.0	19.5	22.9	20.2	21.8	22.8	22.2	23.9	23.9	21.4	24.4	0.41
75-84 yrs	38.0	43.7	40.7	40.9	47.1	48.3	48.4	49.8	52.9	48.4	52.7	1.34
85 or older	70.9	65.7	91.5	95.2	74.3	86.9	102.5	113.4	119.4	110.6	110.8	4.80
<b>Race and ethnicity†</b>												
White‡	15.4	16.2	17.1	15.3	16.8	16.9	16.0	17.4	17.6	16.4	17.0	0.13 (NL)
Black‡	20.1	21.4	18.1	18.7	19.3	21.1	21.7	20.6	19.5	19.4	19.8	0.01 (NL)
Hispanic	16.9	13.8	18.0	19.7	13.1	16.2	12.7	16.3	17.9	9.7	11.6	-0.46 (NL)
Other‡	*	*	*	*	*	*	*	*	*	*	12.1	*

†Rates age-adjusted to 2000 U.S. standard population

\*Suppressed due to less than 20 deaths

‡Non-Hispanic

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Department of Health, Office of Vital Statistics

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 52c. Number of deaths resulting from traumatic brain injuries, by mechanism and year, Ohio, 2000-2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
MV traffic	640	651	696	574	607	576	555	577	559	434	472	21.3%	-20
Falls	271	310	355	377	406	453	491	568	607	587	626	28.3%	37
Pedestrian	83	78	62	73	66	76	74	83	73	70	68	3.1%	-<1 (NL)
Pedal cycle	17	13	15	7	14	11	12	11	10	12	8	0.4%	*
Homicide	210	228	209	179	218	232	231	240	209	245	219	9.9%	2
Suicide	476	532	549	502	573	576	520	562	605	582	606	27.4%	10

Source: Ohio Department of Health, Office of Vital Statistics

NL: Interpret with caution because trend does not follow linear pattern

\*Suppressed due to less than 20 deaths

**Table 53a. Number of hospitalizations resulting from traumatic brain injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Overall	7,200	7,439	7,669	7,897	8,095	8,422	8,293	8,097	7,858
<b>Sex</b>									
Males	4,702	4,804	4,956	5,158	5,305	5,545	5,325	5,171	5,039
Females	2,498	2,635	2,713	2,739	2,790	2,877	2,968	2,926	2,819
<b>Age</b>									
< 1 yr	126	147	126	144	125	133	143	130	106
1-4 yrs	202	168	191	193	170	165	166	184	149
5-14 yrs	524	531	501	441	477	427	419	372	308
15-24 yrs	1,581	1,528	1,533	1,599	1,637	1,536	1,360	1,376	1,292
25-34 yrs	984	997	1,054	1,023	1,071	1,152	1,046	1,018	1,010
35-44 yrs	1,045	1,096	1,130	1,117	1,118	1,093	1,058	1,021	917
45-54 yrs	845	902	953	1,009	1,056	1,210	1,194	1,138	1,128
55-64 yrs	504	561	576	646	705	714	788	753	812
65-74 yrs	437	471	471	520	494	582	584	606	625
75-84 yrs	558	608	678	703	714	791	869	810	801
85 or older	394	430	456	502	528	619	666	689	710

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 53b. Hospitalization rates per 100,000 resulting from traumatic brain injuries by year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	Trend (per yr)
Overall†	62.9	64.7	66.6	68.2	69.8	72.1	70.6	68.7	66.4	0.6 (NL)
<b>Sex†</b>										
Males	85.9	87.5	89.9	93.6	95.5	100.0	95.7	92.8	90.3	0.86 (NL)
Females	40.7	42.4	43.5	43.8	44.1	45.1	45.9	44.7	42.8	0.35 (NL)
<b>Age</b>										
< 1 yr	85.6	99.7	84.4	98.3	84.4	87.7	93.7	88.0	76.2	-1.08 (NL)
1-4 yrs	33.6	28.1	32.1	32.5	29.0	28.1	28.1	31.1	25.6	-0.59 (NL)
5-14 yrs	32.4	33.2	31.7	28.4	31.1	28.2	28.0	24.9	20.2	-1.36
15-24 yrs	99.9	95.8	96.1	100.4	103.5	97.6	86.5	87.9	81.4	-1.99
25-34 yrs	66.7	68.0	72.1	70.2	73.5	78.8	71.5	68.9	71.6	0.50 (NL)
35-44 yrs	59.9	64.2	67.4	67.8	68.9	68.6	68.0	67.2	62.0	0.32 (NL)
45-54 yrs	51.3	53.9	56.2	58.7	60.8	69.2	68.2	64.9	64.7	2.02
55-64 yrs	46.5	49.8	49.3	53.2	56.1	55.0	59.1	54.3	55.9	1.21
65-74 yrs	56.6	61.3	61.4	67.9	64.2	74.4	72.3	72.5	73.5	2.16
75-84 yrs	100.9	109.4	122.0	126.8	129.9	145.7	162.4	149.4	148.0	6.80
85 or older	208.6	219.4	227.5	242.5	245.8	278.2	291.3	303.0	308.1	13.53

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

NL: Interpret with caution because trend does not follow linear pattern

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 53c. Number of hospitalizations resulting from traumatic brain injuries by mechanism and year, Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
Motor vehicle traffic	2564	2,633	2,626	2,395	2,228	2,112	1,835	1,628	1,593	21%	-146
Motor vehicle non traffic	341	369	375	361	366	411	341	365	278	4%	-5 (NL)
Pedal cycle	128	148	161	162	168	190	184	172	141	2%	3 (NL)
Pedestrian	200	220	206	216	224	166	180	160	158	2%	-8
Falls	1379	1,626	1,665	1,709	1,827	2,042	2,097	2,150	1,960	26%	85
Assaults	573	657	696	662	734	763	722	723	627	8%	11 (NL)
Struck by/against	188	192	156	165	219	189	168	167	159	2%	-2 (NL)
Sports and recreation	99	109	90	77	102	92	92	89	84	1%	1 (NL)
Suicide	60	62	75	61	64	78	68	69	66	1%	-2 (NL)
No e-Code	1,913	1,672	1,847	2,313	2,456	2,616	2,879	2,829	2,933	40%	165

\*Mechanisms not mutually exclusive

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 54a. Number of ED visits resulting from traumatic brain injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Overall	51,953	52,878	57,329	59,416	66,250	71,562	75,400	91,576	92,698
<b>Sex</b>									
Males	29,991	30,036	32,812	33,364	37,326	39,839	40,872	48,493	48,515
Females	21,962	22,842	24,517	26,052	28,924	31,723	34,528	43,083	44,183
<b>Age</b>									
< 1 yr	1,830	1,698	1,831	1,858	2,162	2,187	2,329	2,858	2,591
1-4 yrs	6,614	6,114	6,277	6,302	7,535	7,562	7,937	10,607	9,758
5-14 yrs	9,611	8,923	9,254	9,258	10,315	10,832	10,544	14,191	13,659
15-24 yrs	12,009	12,241	13,337	13,871	15,185	15,927	15,752	19,097	18,847
25-34 yrs	6,082	6,287	7,150	7,730	8,060	8,808	9,363	10,649	11,224
35-44 yrs	5,269	5,466	6,066	6,103	6,479	6,902	7,426	7,946	8,144
45-54 yrs	3,434	4,009	4,502	4,907	5,379	6,057	6,912	7,631	7,910
55-64 yrs	1,966	2,318	2,570	2,783	3,174	3,826	4,345	5,260	5,740
65-74 yrs	1,564	1,851	1,951	1,977	2,351	2,719	3,193	3,997	4,304
75-84 yrs	2,148	2,360	2,664	2,713	3,245	3,813	4,216	5,094	5,592
85 or older	1,426	1,611	1,727	1,914	2,365	2,929	3,383	4,246	4,929

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 54b. ED visit rates per 100,000 resulting from traumatic brain injuries by year, Ohio, 2002-2010**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Trend (per yr)</b>
Overall†	461.2	468.3	508.3	527.6	589.6	634.9	667.3	810.4	819.8	52.6
<b>Sex†</b>										
Males	540.3	540.9	591.8	603.3	677.4	723.9	743.3	883.8	885.5	53.0
Females	378.8	391.4	420.6	447.7	496.1	540.5	585.6	729.3	746.7	51.8
<b>Age</b>										
< 1 yr	1,243.4	1,152.0	1,226.8	1,268.2	1,459.1	1,442.5	1,526.4	1,934.7	1,863.5	99.3
1-4 yrs	1,099.1	1,022.3	1,054.0	1,060.4	1,283.5	1,286.3	1,342.6	1,792.3	1,677.2	96.2
5-14 yrs	595.0	558.2	586.0	595.8	672.0	715.0	704.5	949.6	897.1	49.1
15-24 yrs	758.9	767.5	835.8	870.8	959.9	1,011.6	1,002.2	1,220.3	1,187.7	66.7
25-34 yrs	412.2	428.8	489.4	530.4	553.4	602.8	639.8	720.4	796.1	51.8
35-44 yrs	301.8	320.3	362.0	370.4	399.4	433.1	477.3	522.8	550.3	36.0
45-54 yrs	208.6	239.7	265.4	285.7	309.7	346.6	394.7	435.0	454.0	34.5
55-64 yrs	181.5	206.0	219.9	229.3	252.5	294.6	326.0	379.5	395.2	30.1
65-74 yrs	202.7	240.8	254.2	258.1	305.6	347.6	395.6	478.2	506.2	41.0
75-84 yrs	388.3	424.5	479.3	489.5	590.5	702.4	788.0	939.7	1,033.0	86.6
85 or older	754.9	822.1	861.5	924.8	1,100.9	1,316.3	1,479.6	1,867.0	2,139.1	179.9

†Rates are age adjusted to 2000 U.S. standard population

Source: Ohio Hospital Association

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 54c. Number of ED visits resulting from traumatic brain injuries by mechanism\* and year, Ohio, 2002-2010**

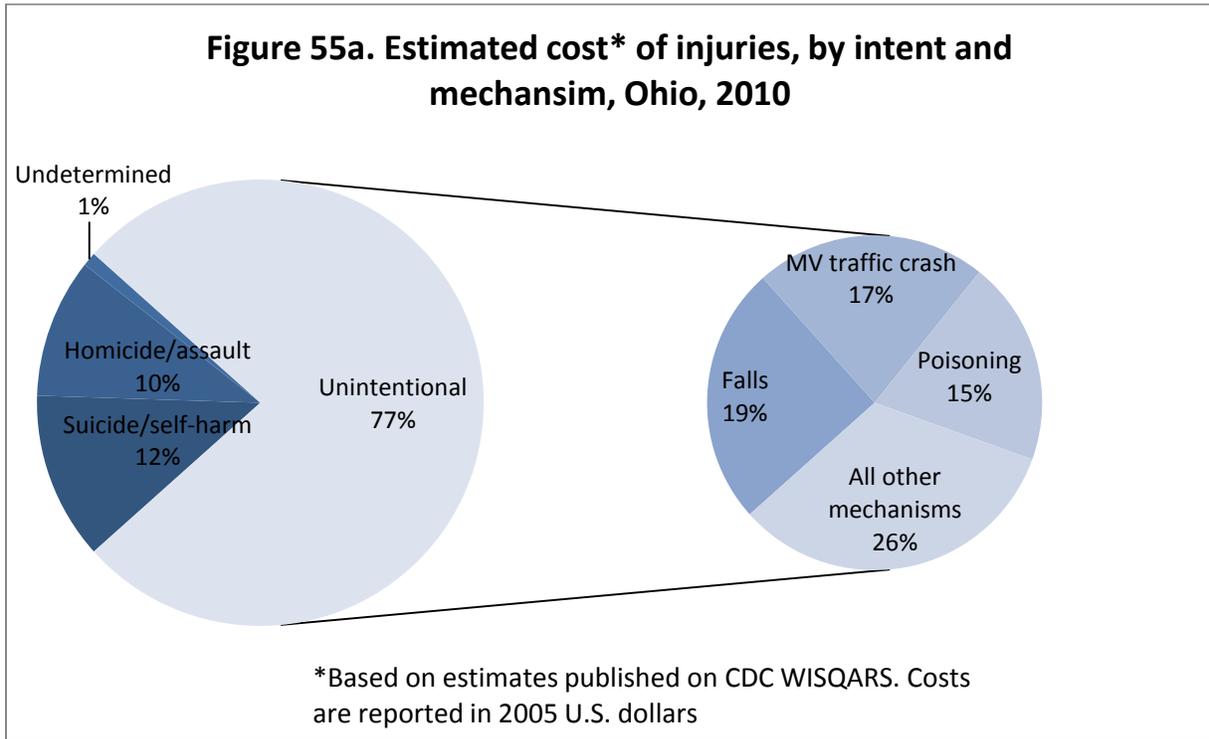
	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Trend (per yr)
<b>Mechanism of TBI</b>											
Motor vehicle traffic	7,169	7,714	8,899	9,277	9,575	9,567	9,059	9,788	10,467	11%	334
Motor vehicle non-traffic	1,829	1,980	2,335	2,367	2,438	2,672	2,475	2,987	2,786	3%	124
Pedal cycle	1,097	1,116	1,274	1,271	1,367	1,574	1,414	1,746	1,553	2%	72
Pedestrian	335	347	357	379	334	429	401	370	404	0%	8 (NL)
Falls	12,707	14,742	17,015	18,346	21,375	24,480	26,624	33,523	33,605	36%	2755
Assaults	3,862	4,356	5,363	6,036	7,083	7,475	7,455	8,230	8,427	9%	592
Struck by/against	6,602	6,911	7,603	8,279	9,789	10,048	10,105	14,086	13,369	14%	927
Sports and recreation	2,596	2,686	2,955	3,138	5,242	4,123	4,024	5,715	4,944	5%	360
No e-Code	18,535	15,918	14,724	13,448	14,168	15,262	17,650	20,482	21,470	23%	552 (NL)

\*Mechanisms not mutually exclusive

NL: Interpret with caution because trend does not follow linear pattern

Source: Ohio Hospital Association

## SECTION 6: ECONOMIC BURDEN OF INJURIES



### ECONOMIC BURDEN:

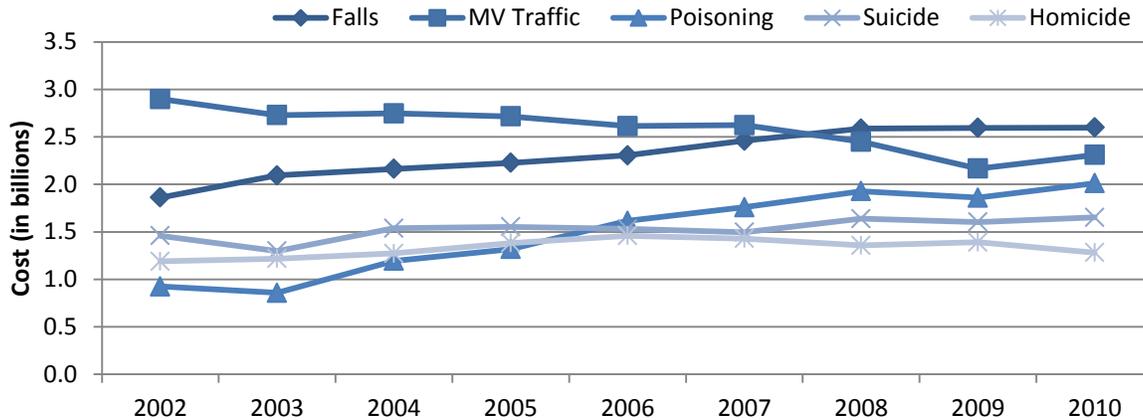
Injuries cost Ohio an estimated \$13.4 billion or \$1,163 per resident in 2010. Fatal injuries cost \$6.7 billion which includes \$76 million associated with medical care and \$6.6 billion related to work loss. Hospitalizations resulting from injuries cost \$3.0 billion which includes \$900 million in medical care and \$2.1 billion associated with work loss. ED visits associated with injuries cost \$3.7 billion which includes \$800 million in medical care and \$2.9 billion in work loss.

Unintentional injuries were associated with the largest share of injury cost at \$10.3 billion or 77 percent. Other injuries making a significant contribution to the cost of injuries were suicide and self-harm behaviors (\$1.7 billion or 12 percent) and homicides and assaults (\$1.3 billion or 10 percent). Approximately \$135 million was associated with undetermined intents and 29 million (less than 1 percent) resulted from legal interventions (see Figure 55a).

Among unintentional injuries, mechanisms associated with highest costs were falls (\$2.6 billion or 19 percent), motor vehicle traffic crashes (\$2.3 billion or 17 percent), and poisoning (\$2.0 billion or 15 percent). Other mechanisms making significant contributions to the cost of injuries were burns (\$212 million), pedestrian (\$183 million), suffocation (\$152 million), pedal cycling (\$138 million), and drowning (\$117 million) (see Figure 55a). Of note, the cost for a substantial percentage of hospitalizations (38 percent) and ED visits (25 percent) is unknown because the injuries do not have an external cause code. This limitation leads to an underestimate in the true cost of injuries by mechanism in Ohio.

In addition to unintentional mechanisms, significant costs were associated with traumatic brain injuries and firearms. Traumatic brain injuries were associated with \$3.2 billion and firearms were associated with \$1.4 billion in 2010.

**Figure 55b. Costs (in billions)\* associated with injury deaths, hospitalizations, and ED visits, by mechanism and year, Ohio, 2002-2010**



\*Based on estimates published on CDC WISQARS. Costs are reported in 2005 U.S. dollars

**TRENDS:**

The cost of injuries has increased 21 percent from \$11 billion in 2002 to \$13.4 in 2010. The increase in the cost of injuries has largely been driven by costs associated with deaths and emergency department visits. Costs associated with deaths increased 20 percent from \$5.6 billion in 2002 to \$6.7 billion in 2010. ED visits increased 43 percent from \$2.6 billion in 2002 to \$3.7 billion in 2010. Costs associated with hospitalizations remained similar (see Figure 55b).

Costs associated with unintentional injuries increased 25 percent from 8.2 billion in 2002 to \$10.3 billion in 2010. Costs associated with intentional injuries increased 11 percent from \$2.6 billion in 2002 to \$2.9 billion in 2010 while costs associated with undetermined intents and legal interventions increased 31 percent and 33 percent respectively.

Among the leading causes of injuries, increases in costs were found among unintentional poisonings (117 percent), falls (40 percent), suicide/self-harm (12 percent), and homicides/assaults (10 percent). In contrast, decreases in costs were found among motor vehicle traffic crashes (20 percent), drowning (9 percent), pedestrian injuries (7 percent), burns (5 percent), and pedal cycle injuries (1 percent).

Costs associated with traumatic brain injuries increased 22 percent from \$2.6 billion in 2002 to \$3.2 billion in 2010 while costs associated with firearms increased 7 percent from \$1.3 billion in 2002 to \$1.4 in 2010. See table 55a for more detailed information on costs associated with injuries in Ohio.

**Burden of Injury in Ohio, 2000-2010**

Ohio Violence and Injury Prevention Program, Ohio Department of Health

**Table 55a. Total costs\* (in millions) associated with injury deaths, hospitalizations, and ED visits in Ohio, 2002-2010**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	% in 2010	Change 02-10
<b>Total costs</b>	11,002	11,054	11,843	12,173	12,729	12,842	13,165	12,793	13,358		21%
<b>Unintentional</b>											
All unintentional	8,228	8,432	8,903	9,132	9,610	9,821	10,028	9,614	10,261	77%	25%
Falls	1,861	2,094	2,163	2,226	2,306	2,460	2,586	2,595	2,598	25%	40%
Motor Vehicle Traffic	2,898	2,729	2,748	2,716	2,614	2,623	2,449	2,166	2,310	23%	-20%
Poisoning	925	859	1,194	1,318	1,615	1,760	1,929	1,854	2,012	20%	117%
Burns	193	193	175	184	204	197	200	181	183	2%	-5%
Pedestrian	229	223	247	236	240	247	226	215	212	2%	-7%
Pedal Cycle	140	133	137	141	154	164	172	165	138	1%	-1%
Suffocation	133	151	179	146	171	147	183	183	153	1%	15%
Drowning	128	116	112	122	115	129	139	105	117	1%	-9%
<b>Intentional</b>											
All intentional	2,649	2,516	2,811	2,935	2,991	2,926	2,997	2,995	2,934	22%	11%
Self-harm and suicide	1,459	1,298	1,538	1,553	1,531	1,496	1,639	1,604	1,652	12%	13%
Assaults and homicide	1,190	1,218	1,273	1,382	1,460	1,430	1,358	1,391	1,282	10%	8%
<b>Other Intent</b>											
Undetermined	103	79	100	80	104	78	119	153	135	1%	31%
Legal Intervention	22	28	29	27	23	17	22	30	29	0.2%	33%
<b>All Intents†</b>											
Traumatic brain injury	2,634	2,600	2,770	2,852	2,919	3,097	3,125	3,196	3,207		22%
Firearm	1,317	1,226	1,297	1,411	1,402	1,364	1,391	1,412	1,412		7%
Missing e-Code (discharges only)	702	710	826	990	1,176	1,325	1,563	1,697	1,376		96%

\*Costs based on estimates from the Centers for Disease Control and Prevention and reported in 2005 dollars

†Includes both intentional and unintentional mechanisms

## **SECTION 7: APPENDICES**

## **APPENDIX 1: DATA SOURCES**

This report uses data from behavioral risk factor surveys, hospital discharge records and death certificates to study patterns and trends in injuries among Ohio residents. The following is brief summary of each data source referenced in this report.

### ***Cost of Injuries***

The medical and work loss cost of injuries was estimated by the Centers for Disease Control and Prevention (CDC). Cost estimates for fatal and non-fatal injuries can be queried on the CDC's Web-based Injury Statistics Query and Reporting System Web (WISQARS).

[http://www.cdc.gov/injury/wisqars/pdf/WISQARS\\_Cost\\_Methods-a.pdf](http://www.cdc.gov/injury/wisqars/pdf/WISQARS_Cost_Methods-a.pdf)

### ***Death Records***

Death records are maintained by ODH's Office of Vital Statistics. Death certificates provide limited information about circumstances of injury circumstances or contributing factors. Both injuries and their external causes were classified according to the 10th Revision of the International Classification of Diseases (ICD-10). See Appendix 3 for a complete list of external cause of injury codes by mechanism and intent.

<http://dwhouse.odh.ohio.gov/datawarehousev2.htm>

### ***Hospital Discharge Records***

Hospital discharge records are collected and maintained by the Ohio Hospital Association (OHA) from information provided by member hospitals. Both injuries and their external causes were classified according to the 9th Revision of the International Classification of Diseases, Clinical Modification (ICD-9-CM). For hospitalizations, a case was defined as an Ohio resident with an injury listed in the primary diagnosis field. For ED visits, a case was defined as an Ohio resident with an injury listed in the primary diagnosis field or a valid external cause of injury code any of the 15 diagnosis fields. Injury mechanisms for both hospitalizations and ED visits were based on the first listed external cause of injury. See Appendix 2 for a complete list external cause of injury codes by mechanism and intent.

<http://www.ohanet.org/>

### ***Leading Causes of Death***

The data source for WISQARS Fatal Injury Data is the National Vital Statistics System (NVSS) operated by the National Center for Health Statistics. WISQARS provides death counts and death rates for the United States and by state, county, age, race, Hispanic ethnicity, sex, and leading cause of death, injury intent, and injury mechanism categories. WISQARS can be used to query death data for the years 1999 - 2009, of which the underlying cause of death is specified using ICD-10 codes.

[http://www.cdc.gov/injury/wisqars/leading\\_causes\\_death.html](http://www.cdc.gov/injury/wisqars/leading_causes_death.html)

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***Ohio Behavioral Risk Factor Surveillance System (BRFSS)***

The Ohio Behavioral Risk Factor Surveillance System (BRFSS) is a random digit dial telephone survey of non-institutionalized adults aged 18 years of older. The BRFSS has been conducted annually by the Ohio Department of Health since 1984. The survey collects information on the prevalence of health behaviors, health care usage, and disease diagnosis associated with the leading cause of disease, injury and death in the United States. Results from the survey are weighted to represent the age, sex, race, and ethnic composition of Ohio.

<http://www.odh.ohio.gov/healthstats/brfss/behrisk1.aspx>

***Ohio Population Estimates***

The National Center for Health Statistics releases bridged-race population estimates of the resident population of the United States for use in calculating vital rates. These estimates result from bridging the 31 race categories used in Census 2000 and Census 2010. The bridged-race population estimates are produced under a collaborative arrangement with the U. S. Census Bureau.

[http://www.cdc.gov/nchs/nvss/bridged\\_race.htm](http://www.cdc.gov/nchs/nvss/bridged_race.htm)

***Ohio Pregnancy Risk Assessment Monitoring System (PRAMS)***

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a population-based survey designed to examine maternal behaviors and experiences before, during and after a woman's pregnancy, and during the early infancy of her child. The Centers for Disease Control and Prevention initiated PRAMS in 1987 in an effort to reduce infant mortality and the incidence of low birth weight. PRAMS were implemented in Ohio in 1999.

<http://www.odh.ohio.gov/healthstats/pramshs/prams1.aspx>

***Ohio Traffic Crash Reports***

The Ohio Department of Public Safety compiles statistical data on crashes that occur on Ohio's roads and highways. Crash data is available in the form of annual reports. Users can also develop customized queries of the data online.

[http://ohiohighwaysafetyoffice.ohio.gov/otso\\_annual\\_crash\\_facts.stm](http://ohiohighwaysafetyoffice.ohio.gov/otso_annual_crash_facts.stm)

***Ohio Youth Risk Behavior Survey (YRBS)***

The Ohio Youth Risk Factor Survey (YRBS) is an anonymous paper and pencil survey of high school students enrolled in public and non-public schools. The YRBS has been conducted in Ohio since 1993 and is collaborative project between the Ohio Departments of Education and Health. The survey collects information on the prevalence of health behaviors, health care usage, and disease diagnosis associated with the leading cause of disease, injury and death in the United States. Results from the survey are weighted to represent the age, sex, race, and ethnic composition of Ohio.

[http://www.odh.ohio.gov/odhprograms/chss/ad\\_hlth/youthrsk/youthrsk1.aspx](http://www.odh.ohio.gov/odhprograms/chss/ad_hlth/youthrsk/youthrsk1.aspx)

## **APPENDIX 2: ANALYTIC METHODS**

This analysis was limited to descriptive statistics, which were generated through the use of Statistical Analysis System (SAS) Version 9.1, Cary, N.C. The data were analyzed using injury surveillance guidelines from the Centers for Disease Control and Prevention (CDC).

### **Deaths:**

- Injury deaths were defined as a death with the underlying cause of death listed as an injury. Traumatic brain injury deaths were defined as deaths with an injury as underlying cause of death and a traumatic brain injury listed in one of the multiple cause of death fields. See Appendix 4 for a list of ICD-10 codes for injury mechanisms and Appendix 6 for a list of mechanism subcategories.
- Deaths included in this report were restricted to Ohio residents.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

### **Hospitalizations:**

- Discharge dataset includes nonfederal, acute care, or inpatient facilities. The dataset does not include Veterans' Affairs and other federal hospitals, rehabilitation centers, or psychiatric hospitals.
- Injury hospitalizations were defined as an inpatient visit with an injury listed in the primary discharge diagnosis field. See Appendix 5 for a list of ICD-9-CM codes for injury mechanisms and Appendix 7 for a list of mechanism subcategories.
- Datasets include readmissions, transfers, and deaths occurring in the hospital.
- Hospitalizations included in this report were restricted to Ohio residents.
- The external cause of injury code used in the analysis was the first listed cause of the discharge diagnosis fields. If the codes E000-E030, E849, E967, E869.4, E870-E879, or E930-E949 were the first listed codes then the next valid external cause code was used.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

### **Emergency Department Visits:**

- Discharge dataset includes nonfederal, acute care, or inpatient facilities. The dataset does not include Veterans' Affairs and other federal hospitals, rehabilitation centers, or psychiatric hospitals.

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- Injury ED visits were defined as an ED visit with an injury listed in the primary discharge diagnosis field or a valid external cause of injury code in any of the discharge diagnosis fields. See Appendix 5 for a complete list of ICD-9-CM codes.
- ED visits included in this report were restricted to Ohio residents.
- Persons who are treated at an ED and later admitted to a hospital are removed from the ED dataset, and therefore are not included in any analysis of ED data.
- The external cause of injury code used in the analysis was the first listed cause of the discharge diagnosis fields. If the codes E000-E030, E849, E967, E869.4, E870-E879, or E930-E949 were the first listed codes then the next valid external cause code was used.
- Rates were calculated by dividing the number of injuries by the number of Ohio residents. Population estimates were based on estimates from the National Center for Health Statistics. Rates were age adjusted to the 2000 U.S. standard population.

**Trend Analysis for Deaths, Hospitalizations and Emergency Department Visits:**

- Trend analysis for annual injury death, hospitalization, and ED visit rates was conducted in Microsoft Excel. Annual injury rates were plotted and a linear trend line was drawn to minimize the distance between the trend line and data point. The goodness of fit for the linear trend line was determined by the R-squared value. Linear trends were defined as a trend line with an R-squared value of 0.5 or higher. Non-linear trends were defined as a trend line with an R-squared value of less than 0.5. The slope and goodness of fit of the trend line were reported in the data tables. Non-linear trends were labeled with (NL) next to the slope.

**Poverty Status and County Urbanity Classifications:**

- County urbanity was derived from county of residence reported by Ohio Behavioral Risk Factor Surveillance System respondents. County urbanity classifications were based on a combination of proximity and connectedness to urban core economic development area and definitions of Appalachian counties established by the Appalachian Development Commission. See Appendix 11 for a map with county classifications.
- Poverty status was derived from household income and household composition reported by Ohio Behavioral Risk Factor Surveillance System respondents. Respondents were grouped into categories based on the 2010 Federal Poverty Guidelines. See Appendix 12 for household income and composition thresholds.

**Cost of Injuries:**

- Fatal Injury costs were calculated by multiplying the number of injury deaths in Ohio by the average cost associated the death for Ohio published on the CDC's

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WISQARS website. See Appendix 8 for average cost estimates by mechanism and intent.

- Non-fatal injury costs for hospitalizations were calculated by multiplying the number of hospitalizations by the average cost associated with hospitalizations for the United States published on the CDC's WISQARS website. See Appendix 9 for average cost estimates by mechanism and intent.
- Non-fatal injury costs for ED visits were calculated by multiplying the number of ED visits by the average cost associated with ED visits for the United States published on the CDC's WISQARS website. See Appendix 10 for average cost estimates by mechanism and intent.
- Total injury costs were calculated by adding the estimated costs for injury deaths, hospitalizations and ED visits.

### **APPENDIX 3: LIMITATIONS OF INJURY SURVEILLANCE DATA**

#### **Death Certificate Data:**

- The cause of death reported on the death certificate is based on the underlying cause of death determined by a physician or coroner. While physicians and coroners are well trained to investigate and determine causes of death, a standardized process for investigating and determining causes of death does not exist in Ohio. This lack of uniformity may lead to differences in how underlying causes of death are classified and pose limitations for comparing rates across local jurisdictions.

#### **Hospital Discharge Data:**

- In each year of the study period, approximately 30 percent of injuries treated in the as inpatients and emergency departments were not assigned an external cause code (E-code). This most likely resulted in an underestimate of total costs and incidence rates, because not all mechanism and intents for injuries could be identified and included in the analysis by mechanism.
- Of the non-fatally injured, only those who sought medical care were captured for this analysis.
- Discharges, not individuals, were the unit of measurement, thereby resulting in duplication when readmissions for the same initial event occurred. The inclusion of readmissions would lead to an overestimate of incidence rates.
- Race and ethnicity are largely incomplete in the hospital discharge data and were not included in the analysis.
- Ohio residents treated in out-of-state hospitals are not consistently included, thereby affecting rates, particularly of border counties.
- Severity of injury is assumed based on type of medical treatment received (i.e., inpatient treatment is for more severe injuries than ED visits).

#### **Behavioral Risk Factor Data:**

- Data from the Pregnancy Risk Assessment Monitoring System (PRAMS), Ohio Youth Risk Behavior Survey (YRBS) and Behavioral Risk Factor Surveillance System (BRFSS) are based on self-reported behaviors by respondents. The accuracy of self-reported data depends on the respondents' ability to recall and willing to report the information. Self-reported data can lead to overestimates or underestimates of the true prevalence in the population depending on the topic being asked.
- Results from Ohio YRBS represent a random sample of students enrolled in high schools in Ohio. The results do not represent high school age youth who have dropped out of school.
- Results from the Ohio BRFSS represent a random sample of non-institutionalized adults ages 18 or older in Ohio with a landline in their home. The BRFSS excludes institutionalized adults and adults living in cell phone only households.

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**APPENDIX 4: EXTERNAL CAUSE OF INJURY CODING FOR ICD-10-CM**

Mechanism	Intent				
	Unintentional	Suicide	Homicide	Undetermined	Legal intervention
All injury	V01–X59, Y85–Y86	*U03, X60–X84, Y87.0	*U01–*U02, X85–Y09, Y87.1	Y10–Y34, Y87.2, Y89.9	Y35–Y36, Y89(.0,.1)
Cut or pierce	W25–W29, W45, W46	X78	X99	Y28	Y35.4
Drowning	W65–W74	X71	X92	Y21	...
Fall	W00–W19	X80	Y01	Y30	...
Fire or hot object or substance	X00–X19	X76–X77	*U01.3, X97–X98	Y26–Y27	Y36.3
Fire or flame	X00–X09	X76	X97	Y26	...
Hot object or substance	X10–X19	X77	X98	Y27	...
Firearm	W32–W34	X72–X74	*U01.4, X93–X95	Y22–Y24	Y35.0
Machinery	W24, W30–W31	...	...	...	...
All transport	V01–V99	X82	*U01.1, Y03	Y32	Y36.1
Motor vehicle traffic	[V02–V04](.1,.9), V09.2, [V12–V14](.3–.9), V19(.4–.6), [V20–V28](.3–.9), [V29–V79](.4–.9), V80(.3–.5), V81.1, V82.1, [V83–V86](.0–.3), V87(.0–.8), V89.2	...	...	...	...
Occupant	[V30–V79](.4–.9), [V83–V86](.0–.3)	...	...	...	...
Motorcyclist	[V20–V28](.3–.9), V29(.4–.9)	...	...	...	...
Pedal cyclist	[V12–V14](.3–.9), V19(.4–.6)	...	...	...	...
Pedestrian	[V02–V04](.1,.9), V09.2	...	...	...	...
Other	V80(.3–.5), V81.1, V82.1	...	...	...	...
Unspecified	V87(.0–.8), V89.2	...	...	...	...
Pedal cyclist, other	V10–V11, [V12–V14](.0–.2), V15–V18, V19(.0–.3,.8,.9)	...	...	...	...
Pedestrian, other	V01, [V02–V04](.0), V05, V06, V09(.0–.1,.3,.9)	...	...	...	...
Other land transport	[V20–V28](.0–.2), [V29–V79](.0–.3), V80(.0–.2,.6–.9), [V81–V82](.0,.2–.9), [V83–V86](.4–.9), V87.9, V88(.0–.9), V89(.0,.1,.3,.9)	X82	Y03	Y32	...
Other transport	V90–V99	...	*U01.1	...	Y36.1
Natural or environmental	W42–W43, W53–W64, W92–W99, X20–X39, X51–X57	...	...	...	...
Overexertion	X50	...	...	...	...
Poisoning	X40–X49	X60–X69	*U01(.6–.7), X85–X90	Y10–Y19	Y35.2
Struck by or against	W20–W22, W50–W52	X79	Y00, Y04	Y29	Y35.3
Suffocation	W75–W84	X70	X91	Y20	...
Other specified, classifiable	W23, W35–W41, W44, W49, W85–W91, Y85	*U03.0, X75, X81	*U01(.0,.2,.5), X96, Y02, Y05–Y07	Y25, Y31	Y35(.1,.5), Y36(.0,.2,.4–.8)
Other specified, NEC	X58, Y86	X83, Y87.0	*U01.8, *U02, Y08, Y87.1	Y33, Y87.2	Y35.6, Y89(.0–.1)
Unspecified	X59	*U03.9, X84	*U01.9, Y09	Y34, Y89.9	Y35.7, Y36.9

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### APPENDIX 5: EXTERNAL CAUSE OF INJURY CODING FOR ICD-9-CM

Mechanism or cause	Manner or intent				
	Unintentional	Suicide	Homicide	Undetermined	Other
Cut or pierce	E920(.0-.9)	E956	E966	E986	E974
Drowning or submersion	E830(.0-.9), E832(.0-.9), E910(.0-.9)	E954	E964	E984	...
Fall	E880.0-E886.9, E888	E957(.0-.9)	E968.1	E987(.0-.9)	...
Fire or burn	E890.0-E899, E924(.0-.9)	E958(.1-.2, .7)	E961, E968(.0, .3)	E988(.1-.2, .7)	...
<i>Fire or flame</i>	E890.0-E899	E958.1	E968.0	E988.1	...
<i>Hot object or substance</i>	E924(.0-.9)	E958(.2, .7)	E961, E968.3	E988(.2, .7)	...
Firearm	E922(.0-.9)	E955(.0-.4)	E965(.0-.4)	E985(.0-.4)	E970
Machinery	E919(.0-.9)	...	...	...	...
MV traffic	E810-E819 (.0-.9)	E958.5	...	E988.5	...
<i>Occupant</i>	[E810-E819] (.0-.1)	...	...	...	...
<i>Motorcyclist</i>	[E810-E819] (.2-.3)	...	...	...	...
<i>Pedal cyclist</i>	E810-E819 (.6)	...	...	...	...
<i>Pedestrian</i>	E810-E819 (.7)	...	...	...	...
<i>Unspecified</i>	E810-E819 (.9)	...	...	...	...
Pedal cyclist, other	[E800-E807](.3), [E820-E825] (.6); E826(.1, .9); [E827-E829] (.1)	...	...	...	...
Pedestrian, other	[E800-E807](.2), [E820-E825] (.7), [E826-E829](.0)	...	...	...	...
Transport, other	[E800-E807](.0,.1,.8-.9), [E820-E825](.0-.5,.8-.9), E826(.2-.8), [E827-E829](.2-.9), E831(.0-.9), E833.0-E845.9	E958.6	...	E988.6	...
Natural or environmental	E900.0-E909, E928(.0-.2)	E958.3	...	E988.3	...
<i>Bites and stings</i>	E905(.0-.6,.9); E906(.0-.4,.9)	...	...	...	...
Overexertion	E927	...	...	...	...
Poisoning	E850.0-E869.9	E950.0-E952.9	E962(.0-.9)	E980.0-E982.9	E972
Struck by or against	E916-E917.9	...	E960.0, E968.2	...	E973, E975
Suffocation	E911-E913.9	E953(.0-.9)	E963	E983(.0-.9)	...
Other specified, classifiable	E846-E848, E914-E915, E918, E921(.0-.9), E923(.0-.9), E925.0-E926.9, E929(.0-.5)	E955(.5,.9), E958(.0,.4)	E960.1, E965(.5-.9), E967(.0-.9), E968.4	E985.5, E988(.0,.4)	E971, E978, E990-E994, E996, E997(.0-.2)
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E977, E995, E997.8, E998, E999
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury	E800-E869, E880-E929	E950-E959	E960-E969	E980-E989	E970-E978, E990-E999

## Appendix 6: Fatal Injury Mechanism Subcategories

Mechanism:	ICD-10 Codes:
<b>Drug Poisoning</b>	
<b>Drug Types</b>	
Heroin	T40.1
Methadone	T40.3
Cocaine	T40.5
All opioids	T40.0-T40.4, T40.6
Prescription opioids	T40.2-T40.4, T40.6
Barbituates	T42.3
Benzodiazepine	T42.4
Other and unspecified	T50.9
<b>Motor Vehicle Traffic Crashes:</b>	
<b>Occupant injured</b>	
Pedestrian	V02-V04 (0.1), V09.2, V09.3
Pedal cycle	V10-18 (0.4, 0.5, and 0.9), V19 (0.4-0.9)
Motorcycle	V20-28 (0.4, 0.5, and 0.9), V29 (0.4-0.9)
Three wheeled vehicle	V30-38 (0.5-0.9), V39 (0.4-0.9)
Car	V40-48 (0.5-0.9), V49 (0.4-0.6)
Pickup truck or van	V50-58 (0.5-0.9), V59 (0.4-0.6)
Heavy transport vehicle	V60-68 (0.5-0.9), V69 (0.4-0.6)
Bus	V70-78 (0.5-0.9), V79 (0.4-0.6)
Other or unspecified	V80-88 (0.0-0.3), V89 (0.2-0.3)
<b>Falls:</b>	
Same level	W01 and W03
Carried by other persons	W04
Wheelchair	W05
Bed	W06
Chair	W07
Other furniture	W08
Playground	W09
Stairs or steps	W10
Ladder or scaffolding	W11 and W12
From/out of building	W13
Tree	W14
Cliff	W15
Jumping or diving in water (not drowning)	W16
Other fall from different level	W17
Other fall from same level	W18
Unspecified	W19
<b>Pedestrian:</b>	
Motor vehicle traffic	V00-V05 (0.1), V09.2, V09.3
Non-motor vehicle traffic	V00-V05 (0.0), V09.0, V09.1
Unspecified	V00-V05 (0.9), V09.9
<b>Pedal Cycle:</b>	
Motor vehicle traffic	V10-V19 (0.4, 0.5, and 0.9)

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Non-motor vehicle traffic	V10-V19 (0.0-0.2)
<b>Suffocation:</b>	
In bed	W75
Other suffocation	W76
Cave-in, falling earth	W77
Inhalation of gastric contents	W78
Ingestion of food	W79
Ingestion of other objects	W80
Low oxygen environment	W81
Other specified	W83
Unspecified	W84
<b>Drowning:</b>	
Bath tub	W65 and W66
Swimming pool	W67 and W68
Natural body of water	W69 and W70
Other	W73
Unspecified	W74
<b>Fire and burns:</b>	
Uncontrolled fire	X00 and X01
Controlled fire	X02 and X03
Flammable material	X04
Nightwear	X05
Other clothing	X06
Other fire	X07
Unspecified fire	X08
Hot water	X09
Other hot fluids	X11
Household appliances	X12
Hot heating appliances	X15
Other hot metals	X16
Unspecified substance	X19
<b>Suicide</b>	
Poisoning	X60-69
Hanging	X70
Drowning	X71
Firearm	X72-74
Explosive material	X75
Smoke, fire, or flames	X76
Steam or hot vapors	X77
Sharp or blunt object	X78-79
Jumping	X80-81
Motor vehicle crash	X82
Other means	X83
Unspecified means	X84
Sequelae of suicide	Y87.0

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<b>Homicide</b>	
Drugs or biologic substances	X85
Gases or vapors	X88
Unspecified chemicals	X89
Hanging	X91
Drowning	X92
Firearm	X93-95
Explosive material	X96
Smoke, fire, or flames	X97
Sharp object	X98
Blunt object	X99
Pushing	Y01-02
Motor vehicle crash	Y03
Bodily force	Y04
Neglect or abandonment	Y06
Other maltreatment	Y07
Other specified means	Y08
Unspecified means	Y09
Sequelae of assault	Y87.1
<b>Traumatic Brain Injury:</b>	
Motor vehicle traffic crash	V30-79 (0.4-0.9), V81-82 (0.1), V83-86 (0.0-0.3), V20-28 (0.0-0.3), V29 (0.4-0.9), V12-14 (0.3-0.9), V19 (0.4-0.6), V02.1, V02.9, V04.1, V04.9, V09.2, V80 (0.3-0.5), V87(0.0-0.8), V89.2
Falls	W00-19
Pedestrian	V01-09
Pedal cycle	V10-19
Homicide	X85-Y09
Suicide	X60-84

## Appendix 7: Hospitalization and ED Visit Injury Mechanism Subcategories

Mechanism:	ICD-9 Codes:
<b>Drug Poisoning</b>	
<b>Drug Types</b>	
Tranquilizers	967x, 969.1-969.3, 969.5, E852.0-E9852.5, E852.8, E852.9, E853.0, E853.1, E853.8, E853.9, E937, E937.1, E937.2, E937.4-E937.6, E937.8, E937.9, E939.1-E939.3, E939.5, E950.2, E950.3, E980.2, and E980.3
Barbituates	304.1, 304.10, 304.11, 304.4, 304.40-304.42, 967.0, E851, E937.0, E950.1, E980.1
Methadone	965.02, E850.1, E935.1
Benzodiazepines	969.4, E853.2, E939.4
Alcohol	291.81, 303.0, 303.00-303.02, 303.9, 303.90-303.93, 305.0, 305.00-305.02, 790.3, 980, 980.0, 980.9, E860, E860.0, E860.1, E860.9, V79.1
Cocaine	304.2, 304.20-304.22, 305.6, 305.60-305.62, 968.5, E855.2, E938.5
All Opioids	304.0, 304.00-304.02, 304.7, 304.70-304.72, 305.5, 305.50, 965.0, 965.00-965.02, 965.09, 965.8, E850.0-E850.2, E850.8, E935.0-E935.2, E935.8
Prescription Opioids	304.0, 304.00-304.02, 304.7, 304.70-304.72, 305.5, 305.50, 965.0, 965.02, 965.09, 965.8, E850.0-E850.2, E850.8, E935.0-E935.2, E935.8
<b>Motor Vehicle Traffic Crashes by nature of accident</b>	
Collision with train	E810
Re-entrant collision with other MV	E811
Collision with other MV	E812
Collision with other non-motor Vehicle	E813
Collision with pedestrian	E814
Collision on highway	E815
Loss of control, not on highway	E816
Noncollision while boarding or Alighting	E817
Other noncollision	E818
Unspecified	E819

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<b>Motor Vehicle Traffic Crashes by occupant injured</b>	
Driver	
Passenger	E810-E819 (.0)
Motorcyclist	E810-E819 (.1)
Motorcycle passenger	E810-E819 (.2)
Street car occupant	E810-E819 (.3)
Occupant of animal drawn vehicle	E810-E819 (.4)
Pedal cyclist	E810-E819 (.5)
Pedestrian	E810-E819 (.6)
Other specified person	E810-E819 (.7)
Unspecified person	E810-E819 (.8)
<b>Falls:</b>	
Steps or stairs	E880
Ladders or scaffolding	E881
Building or other structure	E882
Hole or other opening	E883
From one level to another	E884
Fall from same level	E885
Other or unspecified	E886
<b>Hip Fracture:</b>	820 in any discharge diagnosis field
<b>Pedestrian and Pedal Cycle:</b>	
Motor vehicle traffic	E810-819
Non-motor vehicle traffic	E820-825
Railway	E800-809
Other road vehicle	E826-829
<b>Sports and Recreation:</b>	
Sports, no mention of wheels	E886.0, E917.0, E917.5
Recreation, no mention of wheels	E849.4, E883.0, E884.0, E885.3, E885.4, E902.2, E910.0-E910.2, E922.2, E922.4, E922.5, E987.2
Recreation, wheels	E885.0-E885.2
<b>Suffocation:</b>	
Food objects	E911
Non-food objects	E912
Mechanical suffocation	E913
<b>Drowning:</b>	
Accidental drowning	E910
Watercraft causing submersion	E830
Other water transport	E832

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<b>Fire or burn:</b>	
Conflagration	E890-892
Ignition of objects	E893-894
Controlled fire	E895-897
Other fire	E898
Unspecified fire	E899
Hot object	E924
<b>Self-harm:</b>	
Poisoning	E950-952
Hanging	E953
Drowning	E954
Firearms	E955
Cutting or piercing	E956
Jumping	E957
Other and unspecified	E958
Late affects	E959
<b>Assaults:</b>	
Fight or brawl	E960.0
Rape	E960.1
Corrosive substance	E961
Poisoning	E962
Hanging	E963
Drowning	E964
Firearms	E965
Cutting or piercing	E966
Perpetrator of abuse	E967
Other and unspecified	E968
Late affects of assault	E969
<b>Traumatic Brain Injury:</b>	
Falls	E880-888
Motor vehicle traffic crashes	E810-819
Motor vehicle non-traffic crashes	E820-829
Pedal cycle	E800-809(0.3), E810-825(0.6), E826.1, E829.1, E827.1, E828.1, E829.1
Pedestrian	E800-809(0.2), E810-825(0.7), E826.0, E827.0, E828.0, E829.0
Assaults	E960-969
Self-harm	E950-959
Sports and recreation	E886.0, E917.0, E917.5
Struck by/against	E849.4, E883.0, E884.0, E885.3, E885.4, E902.2, E910.0-E910.2, E922.2, E922.4, E922.5, E987.2
	E885.0-E885.2
	E916, E917

## Appendix 8: Fatal Injury Costs

**Average costs associated with fatal injuries by intent and mechanism, Ohio, 2005 U.S. dollars**

<b>Intent</b>	<b>Medical Care</b>	<b>Work Loss</b>
Unintentional	11,634	837,333
Suicide	2,926	1,064,570
Homicide	6,901	1,362,975
Undetermined	6,804	989,746
Legal Intervention	4,755	1,321,443
<b>Unintentional mechanisms</b>		
Falls	20,728	251,529
MV traffic	9,547	1,095,338
Drowning	3,905	1,127,124
Fire/burn	19,095	780,015
Poisoning	3,957	1,191,574
Pedal	17,645	1,118,621
Pedestrian	11,972	987,488
Suffocation	14,259	540,573
<b>All intents</b>		
Traumatic brain injuries	6,433	465,960
Firearms	3,769	1,160,514

## Appendix 9: Injury Hospitalization Costs

**Average costs associated with injury hospitalizations by intent and mechanism, United States, 2005**

<b>Intent</b>	<b>Medical Care</b>	<b>Work Loss</b>
Unintentional	21,996	47,781
Suicide	8,183	17,012
Homicide	20,154	119,478
Undetermined		
Legal Intervention	16,807	72,992
<b>Unintentional mechanisms</b>		
Falls	19,672	35,628
MV traffic	40,825	79,625
Drowning	35,106	283,010
Fire/burn	18,247	51,981
Poisoning	9,621	3,024
Pedal	39,672	96,557
Pedestrian	42,814	87,372
Suffocation	37,898	25,925
<b>All intents</b>		
Traumatic brain injuries	61,017	99,667
Firearms	14,716	79,615

## Appendix 10: Injury Emergency Department Visit Costs

**Average costs associated with injury ED visits by intent and mechanism, United States, 2005**

<b>Intent</b>	<b>Medical Care</b>	<b>Work Loss</b>
Unintentional	786	2,877
Suicide	959	3,086
Homicide	1,187	868
Legal Intervention	946	2,634
<b>Unintentional mechanisms</b>		
Falls	954	456
MV traffic	661	2,922
Drowning	676	556
Fire/burn	517	1,108
Poisoning	1,186	3,255
Pedal	1,035	3,496
Pedestrian	1,087	2,597
Suffocation	931	2,775
<b>All intents</b>		
Traumatic brain injuries	1,650	8,610
Firearms	849	3,200

## Appendix 11: County Urbanity Classifications

The map describes county urbanity classification used in this report. Counties were classified as urban if they had an urban core that served as a center of economic activity for surrounding counties. Counties were considered suburban if they were located adjacent to an urban county and strongly connected with economic activity in the urban county. Rural counties do not have an urban core and not strongly connected to an adjacent urban county. The Appalachian classification was based on the Appalachian Development Commission with the exception of Mahoning and Trumbull counties. Mahoning County was classified as an urban county and Trumbull was considered to be a suburban county in the report.



## Appendix 12: 2010 Federal Poverty Guidelines

Family Size:	Annual Household Income Threshold		
	Below Poverty	Less than 200% above poverty	200% or more above poverty
1	\$10,830	\$10,831-21,659	\$21,660+
2	\$14,570	\$14,571-29,139	\$29,140+
3	\$18,310	\$18,131-36,259	\$36,260+
4	\$22,050	\$22,051-44,009	\$44,100+
5	\$25,790	\$25,791-51,579	\$51,580+
6	\$29,530	\$29,531-59,059	\$59,060+
7	\$33,270	\$33,271-66,539	\$66,540+
8	\$37,010	\$37,011-74,019	\$74,020+