



Central Ohio Trauma System (COTS) 2006 Report
Motor Vehicle Traffic Crash and Assault Injuries in Central Ohio
A Public Health Assessment



06

Prepared By:

Ben DeJesus, MS,
Assessment and Surveillance

Mike Smeltzer, MPH,
Injury Prevention Team Leader



Columbus Public Health
Division of Planning and Preparedness
240 Parsons Avenue
Columbus, OH 43215

www.publichealth.columbus.gov

In Conjunction With:

Nancie Bechtel, RN, BSN, MPH, CEN, EMTB,
Executive Director

Roxanna L. Giambri, BS, RHIA,
Trauma Registry Coordinator



Central Ohio
Trauma System

Central Ohio Trauma System
431 E. Broad Street
Columbus, OH 43215

www.goodhealthcolumbus.org

Partially funded by a grant from the Ohio
Department of Public Safety and The National
Highway Traffic Safety Administration

The Central Ohio Trauma System is an affiliate
of the Columbus Medical Association

06



Central Ohio Trauma System (COTS) 2005-06 Injury Report Contents

ii	v	vi	1	9	21	27	33	39
Central Ohio Trauma System	Columbus Public Health	Executive Summary	Section I 2002-2005 Franklin County (All Injury Hospitalizations)	Section II 2002-2005 Franklin County (Unintentional Injury, Hospitalizations) A. Falls B. MVT	Section III 2002-2005 Franklin County (Assault Injury Hospitalizations)	Section IV 2002-2005 Regional (All Injury Hospitalizations)	Section V 2003 Franklin County Mortality	Appendices

Central Ohio Trauma System

The Central Ohio Trauma System (COTS) is a 501(c)(3) organization with charitable, educational and scientific intent. COTS mission is to save and improve lives through the coordination of trauma and emergency healthcare resources. COTS supports prevention, education, data collection and research initiatives. COTS' purpose is to serve as the forum for addressing issues affecting the delivery of trauma/emergency healthcare services and injury prevention in central Ohio. COTS' goals are to improve patient outcomes; enhance practice efficiency; save costs to patients, caregivers, institutions and the community overall from healthcare associated with medical emergencies and trauma; and to serve as a community resource/expert on trauma and emergency service issues.

COTS' objectives include:

- The establishment of an inclusive system where community partners work together to resolve issues associated with trauma and emergency care
- Reliable data analysis on the region's trauma patients to improve patient care; to provide a basis for focusing initiatives on areas of highest need; and to provide benchmarks for measuring progress
- Stakeholder participation in a trusted COTS-facilitated process that accomplishes:
 - Central Ohio resources working together for a reduction in deaths and permanent disabilities from trauma and emergency health issues

- Enhanced emergency care
- Improved collaboration among healthcare and community services
- Expanded public education with regards to injury prevention
- Comprehensive preparedness and response by local healthcare partners in large scale disasters
- To be the recognized leader addressing trauma-related and emergency services issues in central Ohio

Many emergency health care stakeholders in the central Ohio community are the "life blood" of COTS, including physicians, nurses, emergency medical technicians, paramedics, fire departments, hospitals, researchers, and public health professionals. COTS is an affiliate organization of the Columbus Medical Association. The following individuals currently serve on the COTS Board of Trustees.

Kathryn J. Haley, RN, BSN, Trauma Program Director, Children's Hospital, *Columbus, Ohio*; COTS President

Clifford L. Mason, EMTP, Fire Chief, Madison Township Fire Department, *Groveport, Ohio*; representing the Fire Chiefs Association of Central Ohio; COTS Vice-President

Thomas J. Gavin, MD, FACEP, Assistant Professor, Emergency Medicine Education Director, Center for EMS, The Ohio State University Hospitals, *Columbus, Ohio*, representing The Ohio State University Hospital East; COTS Secretary-Treasurer

Jonathan I. Groner, MD, Trauma Medical Director, Children's Hospital & Associate Professor of Surgery, The Ohio State University College of Medicine and Public Health, *Columbus, Ohio*; representing the Columbus Medical Association; COTS Immediate Past-President

Robert E. Falcone, MD, FACS, Health Care Consultant, Past President Grant Medical Center, Columbus, Ohio; Trustee Emeritus

Jennifer A. Bogner, PhD, Director of Research, the Ohio Regional TBI Model System, Department of Physical Medicine and Rehabilitation, The Ohio State University Medical Center, *Columbus, Ohio*

Marco J. Bonta, MD, FACS, Medical Director, Trauma & Surgical Services, Riverside Methodist Hospital, *Columbus, Ohio*

Mary Jean Botos, BS, RN, Risk Management/Quality Director, New Albany Surgical Hospital, *New Albany, Ohio*

Edward Boudreau, DO, Chief Medical Officer, Mount Carmel St. Ann's, *Westerville, Ohio*

Scott R. Bryant, RN, BBA, Administrative Director, Emergency Department, Adena Regional Medical Center, *Chillicothe, Ohio*

Philip H. Cass, PhD, CEO Columbus Medical Association/Columbus Medical Association Foundation/Physicians Free Clinic/COTS

Robert Coles, Deputy Chief, Department of Public Safety, Division of Fire, *Columbus, Ohio*



Central Ohio Trauma System

Susan G. Cook, RN, BSN, Manager
Emergency Services, Fairfield Medical Center,
Lancaster, Ohio

Rebecca K. Dillon, RN, Manager Emergency
Services, Memorial Hospital of Union County,
Marysville, Ohio

John Drstvensek, MD, FACEP, Chairman &
Medical Director, Emergency Services, Grant
Medical Center and Riverside Methodist
Hospital, *Columbus, Ohio*

Carol J. Elliott, MSN, RN, Director,
Emergency Services, Mount Carmel East,
Columbus, Ohio

Charles Feicht, DO, FACEP, Medical Director,
Genesis Health Care System, *Zanesville, Ohio*

Elaine L. Flowers, RN, Department Director,
Emergency Services, Knox Community
Hospital, *Mt. Vernon, Ohio*

Lucinda F. Hill, RN, BSN, EMTP, Trauma
Nurse Coordinator, Southeastern Ohio Regional
Medical Center, *Cambridge, Ohio*

Joseph T. Hooper, Vice President of
Operations, Marion General Hospital,
Marion, Ohio

Robert Kaufman, EMTP, Assistant Fire Chief,
Norwich Township Fire Department, *Hilliard,
Ohio*; representing the Franklin County Fire
Chiefs Association

Connie Kelly, RN, Vice President, Patient
Care Services, Berger Health System,
Circleville, Ohio

David P. Keseg, MD, FACEP, Medical Director,
Columbus Division of Fire/EMS, Ohio and Chief
Development Officer for Premier Health Care
Services, *Dayton, Ohio*; Special Advisor
to the Board

Bradley Lewis, MD, County Coroner, Franklin
County Coroner's Office, *Columbus, Ohio*

Robert A. Lowe, MD, FACEP, Director
Emergency Medical Services, Doctors Hospital,
Columbus, Ohio

Medard R. Lutmerding, MD, FACEP,
Chairman of the Department of Emergency
Medicine, Mount Carmel West, Columbus,
Ohio; representing the Columbus
Medical Association

Larry Martin, MD, Director, Division of
Trauma, The Ohio State University Hospitals,
Columbus, Ohio

Richard N. Nelson, MD, FACEP, Vice Chair &
Medical Director, Emergency Department, The
Ohio State University Hospitals, Columbus,
Ohio; representing the Columbus
Medical Association

Tina Perko, MHA, Senior Administrative
Officer, Pike Community Hospital, *Waverly, Ohio*

Jennifer A. Piccione, RN, BSN, Emergency
Services Department Manager, Madison
County Hospital, *London, Ohio*

Tracy E. Richmond, RN, BSN, Associate
Director of Nursing, Coshocton County
Memorial Hospital, *Coshocton, Ohio*

Steven A. Santanello, DO, FACEP, Medical
Director, Trauma Services, Grant Medical
Center, *Columbus, Ohio*

James M. Sinard, MD, Trauma Medical
Director, Mount Carmel West, *Columbus, Ohio*

Mike Smeltzer, MPH, Director, Office of Public
Health Standards and Violence Prevention,
Columbus Health Department, *Columbus, Ohio*

Kimberly S. Thompson, RN, BSN, Director,
Critical Care Services, Grady Memorial
Hospital, *Delaware, Ohio*

Susan A. Tilgner, MS, RD, LD, RS, Health
Commissioner, Franklin County Board of
Health, *Columbus, Ohio*

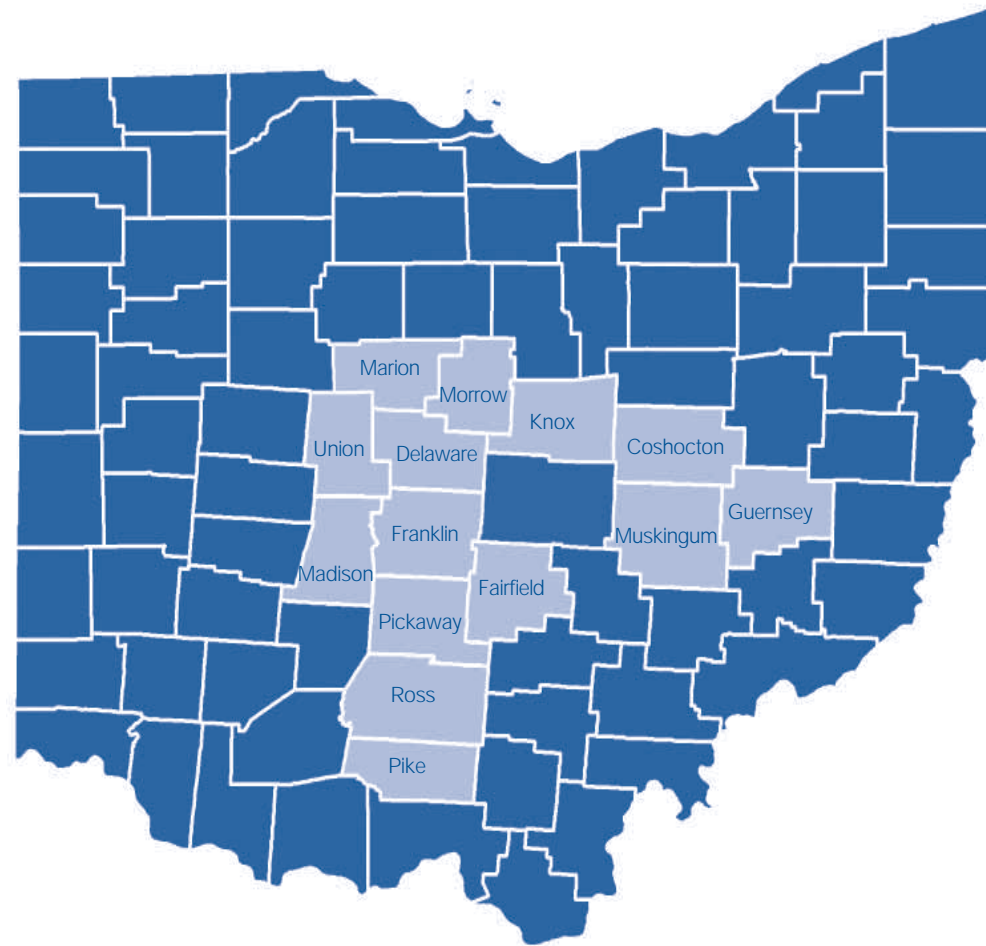


Central Ohio Trauma System

The COTS Regional Trauma Registry was founded in 1999. This Registry is the source for much of the data used in this report. Ohio law mandates that hospitals report trauma data to the Ohio Trauma Registry (OTR), and COTS serves as the regional repository for hospitals' trauma data to the OTR. COTS uses the data regionally as a baseline to improve trauma/emergency healthcare services in central Ohio. The COTS Trauma Registry has collected data on over 55,000 trauma admissions in central Ohio since its inception. This trauma data is used by:

- COTS to ascertain that the best possible care is being provided to local citizens
- COTS to achieve system-wide improvements
- The Columbus Public Health Department in planning community prevention initiatives
- Other local injury prevention groups
- Local hospitals and EMS agencies to improve patient care
- Community researchers
- The public at large to be more aware of trauma and injury prevention

To learn more about COTS work in central Ohio, or for extra copies of this report or additional data from the COTS Registry, contact (614) 240-7419, extension 6.



Lightened counties are those actively participating along with COTS in the Central Ohio Regional Trauma Registry.



Columbus Public Health

Columbus Public Health is the local health agency for the City of Columbus. Established in 1904, the department is charged with assuring conditions in which people can be healthy. Columbus Public Health is made up of a range of programs providing clinical, environmental, health promotion, and population-based services. The department has an annual budget of \$35 million and is staffed by nearly 500 full-and part-time employees.

Mission

Columbus Public Health is a leader in improving the health and safety of Columbus by monitoring community health status, identifying and addressing public health threats, enforcing laws that protect the public's health, and providing services to prevent and control disease.

Our Vision

All people who live and work in Columbus are protected from disease and other public health threats and empowered to utilize health services, health information, and other resources to achieve their optimum health. Columbus Public Health is valued as a leader for identifying public health priorities and mobilizing resources and community partnerships to address them. We have resources to be effective and to support flexible, committed, and high-performing employees in accomplishing our work.

Public Health Goals Established for the Department are to:

- Provide visible leadership to effectively identify and respond to public health threats and priorities
- Develop sustainable community systems for addressing public health threats and priorities
- Establish greater visibility and support for Columbus Public Health among community leaders, other organizations, and the general public
- Provide tools and information to empower people and neighborhoods to gain greater control of the factors that influence their health
- Develop organizational capacity and resources to support department-wide efficiency and effectiveness



2006 Executive Summary

This is the fifth annual report that the Central Ohio Trauma System (COTS) and Columbus Public Health have jointly produced. It reflects **distressing trends of increasing numbers and rates of major injuries** in the central Ohio region---since our last report in 2004, Franklin County has seen 27% increase in the number of residents requiring at least 48 hours of hospitalization as a result of physical trauma. The past three years have endured **consistent increases in motor vehicle crash, fall, and assault injuries** in our community. **Nine people a day on average are hospitalized here due to a serious, usually preventable injury.** Trauma injuries from motor vehicle crashes involving Franklin County residents cost our community over \$150,000,000 in 2005 alone.

Three sources of data are used in this report. The first source is the COTS regional trauma registry which provides the injury morbidity (nonfatal) data up to and including 2005. In this report, COTS data reflects people hospitalized for at least 48 hours. It does not include injured persons treated at home, or people treated in an emergency department and released, or those admitted to a hospital for less than 48 hours. So the nonfatal injuries documented here are the tip of the iceberg as far as the total number. Also, COTS receives data from a 14-county region in Central Ohio, however all other counties are much less populated than Franklin County and most have just one hospital. Therefore, Franklin County data from the COTS registry make up the bulk of the information in the report. The chapter on regional hospitalizations underscores the fact that, with most injury types, **increases in injury hospitalizations are regional.**

The second source of data in this report is from Ohio Vital Statistics reports, which provides trauma fatality data for 2003. The third source of data in this report is from the Ohio Department of Public Safety Crash Reports, which gives us information on motor vehicle crash fatality through 2005. Franklin County is unique in having an injury surveillance system to document nonfatal injury cases. This adds an additional level of accuracy in being able to measure the extent of the problem. Ohio and other communities in Ohio are generally only able to measure injury fatalities.

Ohio has adopted the national *Healthy People 2010 Goals* (U.S. Department of Health and Human Services) for reduction in injury fatalities. The goal for injury deaths from all causes is 37.0 per 100,000 population; the goal for unintentional injury deaths is 17.5; and the goal for assault deaths is 10.0¹. The current 2005 Franklin County rates are 43.0, 25.9, and 17.0 respectively, meaning that **Franklin County rates are above the national goals with the trend in the wrong direction.**

Interventions such as enforcement, education and engineering—the “three E’s”—are effective in reducing serious injuries and resulting fatalities. Franklin County has used these interventions with success in reducing pedestrian injuries in recent years. In 2002 there were 86 pedestrian trauma hospitalizations; in 2005 there were 64—a 26% reduction. The collaboration of many local agencies brought about this significant decrease. Police concentrated on enforcing speeding laws around elementary schools. Hospitals’ trauma programs provide injury prevention

presentations in schools. The Mayor of Columbus spoke publicly against speeding in neighborhoods, supported an aggressive sidewalk construction program, initiated transportation measures to reduce speeding, and enhanced places for safe walking. The Columbus Public Health Department convenes the Columbus Area Pedestrian Safety Committee which develops effective interventions for reducing pedestrian injuries. Just as our community impacted pedestrian injuries by implementing the “three E’s,” we must address the other primary injury causes---motor vehicle crashes, falls and assaults.

This report contains a lot of statistical and analytical information but is ultimately about people and the tragedy of serious injury to individuals, families and the community as a whole. As a community, we must acknowledge that injuries are not “accidents.” **Injuries are predictable and preventable.** There are instances when an event itself may not be preventable, but the resulting injury is. As a community, we must begin to seriously look at the negatives associated with traumatic injuries and focus resources on known prevention strategies. Injury prevention programming is paramount to saving the lives of our citizens and to address overall the wellness of our community.





SECTION I:
2005 Franklin County Injury
Hospitalizations & Trends



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Introduction

Injury is defined as physical damage caused by the transfer of energy to tissues of the body. This energy comes in different forms including kinetic/mechanical (such as being struck by or striking something), thermal (burns), chemical or electric. Injury can also be caused by a lack of elements necessary for survival (such as oxygen or heat).

Simple injuries include cuts and bruises and are not life threatening. The term trauma indicates more severe injuries. *Trauma* implies that the injuries, if untreated, could result in lifelong disability or even death. Trauma also suggests that more than one body system is potentially injured by the energy transfer to the tissues.

This report captures trauma in central Ohio. It does **not** capture all the simpler injuries that occurred. This report also only includes the *critical* trauma injuries, meaning only those cases where a patient was admitted to a hospital for greater than 48 hours as a result of their injury.

This report shows trauma data between 2002 and 2005. It compares injuries by "raw" numbers, meaning that the number of people in any given injury category are simply counted. Because population numbers have likely risen between 2002 and 2005 in central Ohio, it makes sense that there could be overall higher numbers of injuries. However, this report also reports injuries by *rates*. Rates allow us to look at the number of injuries in relation to a standard figure.

We use "per 100,000" people as our standard figure. This allows us to look over time and determine whether we have an increase or decrease in trauma injuries regardless of whether the population grew.

In this report injuries will be classified in several ways:

- By the events or activities that precede them (e.g. motor vehicle crash, firearm-related)
- By the outcome or result of the energy transfer (e.g. traumatic brain injury, burns)
- By the intention of the act which caused the injury (e.g. no intent, abuse, suicide, homicide)

In addition this report uses the term "unintentional" to describe trauma injuries resulting from mishaps. We avoid the word "accident" because it suggests something unpredictable or random and therefore not preventable. Most injuries ARE predictable AND preventable. This report provides information regarding how, when and where trauma injuries typically occur so that we can identify who may be at the highest risk. Interventions can then be focused where they will be most effective.

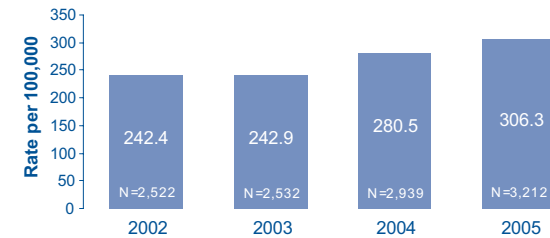


Figure 1.1: 2002-05 Rates of Injury Hospitalization per 100,000 Population by Year, Franklin County, OH

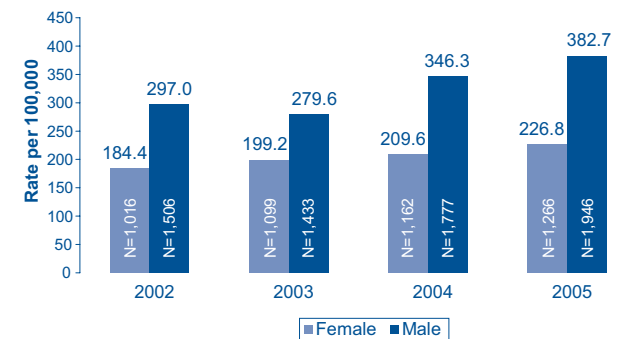


Figure 1.2: 2002-05 Rates of Injury Hospitalization per 100,000 Population by Gender and Year, Franklin County, OH



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

There are nearly 1.1 million people living in Franklin County. In 2005, the Central Ohio Trauma System recorded 3,212 cases in which patients were hospitalized for forty-eight hours or more due to trauma injuries (referred to as “injury hospitalizations” in this report). The rate per 100,000 people is 306 compared to the 2004 rate of 280 (2,939 injury hospitalizations). This is a 9% increase.

Males in Franklin County are at significantly greater risk than females. In 2005, the rate per 100,000 for males was 383 compared to a rate of 227 for females. The male rate is 69% higher than the female rate. Males have the highest number and rate of trauma injuries for all age groups 0-64. Females have more trauma injuries in the 65-74 age group but a slightly lower rate per 100,000 than males. In the 75+ age group females have higher numbers and rate of trauma injuries.

As Figure 1.3 indicates, residents of certain zip codes are at increased risk for trauma injury. The average rate of hospitalizations for trauma injuries for all zip codes from 2002-05 is 268 per 100,000 people. Residents at increased risk of injury live in zip codes 43203, 43205, 43222, 43201 and 43206. Residents in zip code 43203 have a trauma hospitalization rate of 459 per 100,000. This rate is 71% higher than the average rate.

The rate of unintentional and intentional trauma injury among people hospitalized 48 hours or more has been increasing for the past 3 years. The rate of intentional injury 48 hour

hospitalizations in 2002 was 210 per 100,000 compared to 258 in 2005. The intentional rate was 27 per 100,000 in 2002 compared to 43 in 2005.

Injury mechanism is a description of the event or activity that occurred to cause the trauma injury. Table 1.2 lists the primary mechanisms causing most injuries. In Franklin County the most frequent causes of injury hospitalizations are falls and motor vehicle crashes, followed by *Intentional Injuries (Assaults, Suicides, Homicides)*. Fall and motor vehicle injuries are usually unintentional. In the following chapters these causes are discussed in detail to try to identify the population groups most at risk, so that interventions can be focused on these groups. Population groups are described in terms of age group, gender and geographic location of residence (zip code).

Table 1.1: 2005 Number and Rate of Injury Hospitalizations by Gender and Age Group, Franklin County, OH

	Female		Male		Total	
	Number	Rate	Number*	Rate	Number*	Rate
00-04	47	114.8	93	217.1	140	167.1
05-14	81	110.9	142	187.6	223	149.9
15-24	131	168.9	351	435.0	482	304.6
25-44	224	132.3	619	358.1	843	246.4
45-64	252	191.4	449	376.8	701	279.5
65-74	121	395.0	118	497.9	239	439.9
75+	410	1213.7	173	911.2	583	1104.9
Total	1266	226.8	1946	382.7	3212	306.3

*Note: Number does not add up to total. One case was missing age information and could not be assigned an age category.

- In 2005, there were 3,212 trauma injuries requiring 48 hours or more of hospitalizations (a rate of 306.3 per 100,000 population)
- On average, the number and rate of trauma hospitalizations has increased by 8.7 and 8.4 percent respectively every year from 2002 through 2005

Demographics

- In 2005, males made up approximately 60% of trauma injuries requiring 48 hours or more of hospitalization
- On average, the number and rate of male injury hospitalizations have increased 9.6% and 9.5% respectively, while female injury hospitalizations increased 7.6% and 7.1% respectively, every year from 2002 through 2005
- In 2005, the age groups with the greatest number and percentage of injury hospitalizations include the 20-24 (8.2% of total) and 85+ (7.8% of total) year groups
- In 2005, males aged 15-44 made up approximately 30% of the total injury hospitalizations



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Geography

- From 2002-2005, the top 5 residence zip code geographic areas with the highest average number of injury hospitalizations include 43224, 43110, 43209, 43223 and 43219
- From 2002-2005, the top 5 residence zip code geographic areas with the highest average rate of injury hospitalizations include 43203, 43205, 43222, 43201 and 43206

Intentionality

- As in previous years, in 2005, unintentional trauma injuries made up a vast proportion of injury hospitalizations (82.7%), followed by Assaults (15.3%)
- On average, the percentage of injury hospitalizations due to unintentional causes has decreased 1.0% a year, every year, from 2002 through 2005, while assault related hospitalizations has increased approximately 7.1% per year, every year

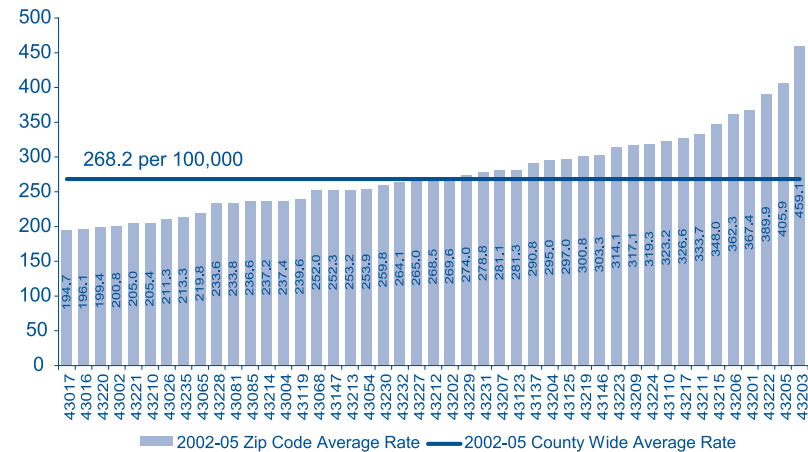


Figure 1.3: 2002-05 Average Rates of Injury Hospitalization per 100,000 Population, by Zip Code of Residence, *Franklin County, OH*

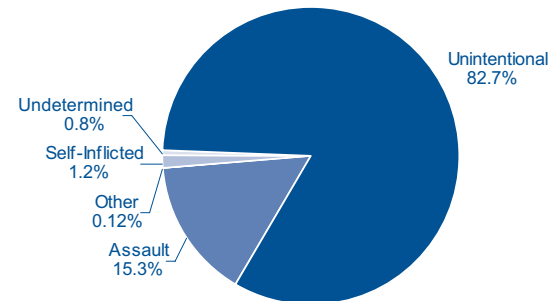


Figure 1.4: 2005 Percentage of Injury Hospitalizations by Intentionality, *Franklin County, OH*



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Mechanisms

- The top three mechanisms of all non-fatal injury hospitalizations among Franklin County residents in 2005 are *Falls, Motor Vehicle Traffic Crashes, and Struck-by or Against an Object or Person*. These three accounted for 76% (2,448 of 3,212) of the total number of injuries requiring two or more days of injury hospitalization.
- On average, the number and rate of Fall related injury hospitalizations have increased 12% and 11% respectively per year, every year from 2002 through 2005
- On average, the number and rate of *Motor Vehicle Traffic Crash* related injury hospitalizations increased 7.5% and 7.3% per year, every year from 2002 through 2005
- On average, the number and rate of *Struck by or Against an Object or Person* have both increased 13% per year, every year from 2002 through 2005

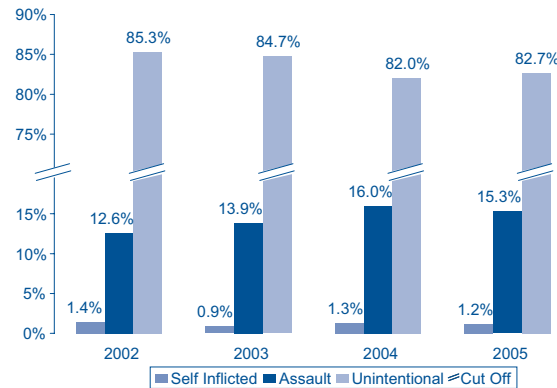


Figure 1.5: 2002-05 Percentage of Injury Hospitalizations by Intentionality and Year, *Franklin County, OH*

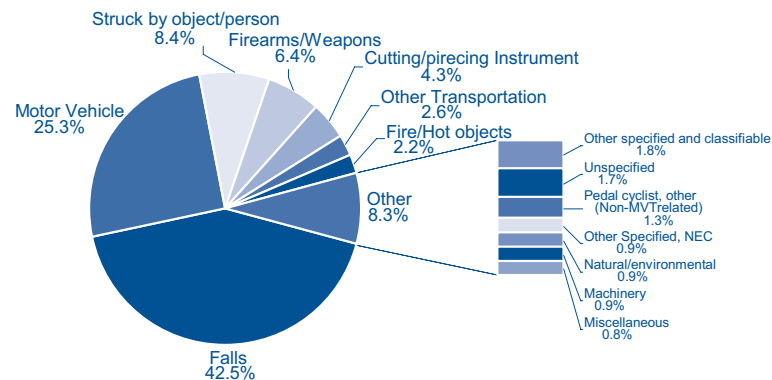


Figure 1.6: 2005 Percentage of Injury Hospitalizations by Mechanism, *Franklin County, OH*



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Table 1.2: 2002-2005 Injury Hospitalization Numbers and Rate per 100,000 Population, by Mechanism and Gender, *Franklin County, OH*

	2002				2003				2004				2005			
	Female		Male		Female		Male		Female		Male		Female		Male	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Fall	538	98.6	433	98.7	612	112.3	443	99.1	657	119.6	549	122.4	739	132.3	626	140.7
Motor vehicle traffic (MVT)	268	48.0	390	73.6	314	56.1	362	68.5	288	51.5	478	90.0	311	55.9	502	94.9
Struck by, against	32	5.7	166	30.4	37	6.6	143	25.4	48	8.5	212	37.7	47	8.2	223	40.4
Firearm	17	2.9	105	17.6	13	2.2	153	25.7	18	3.1	142	24.4	23	4.1	182	31.3
Cut/pierce	12	2.2	96	17.0	19	3.3	70	12.3	24	4.1	77	13.6	28	5.0	109	19.
Fire/hot object	32	5.9	54	10.4	31	5.6	55	10.4	35	6.2	64	11.7	26	4.7	46	8.6
Transport, other	20	3.6	60	10.8	18	3.3	47	8.7	21	3.9	50	9.3	23	4.2	62	11.4
Other specified and classifiable	16	2.7	35	6.4	23	4.0	32	5.8	16	2.8	61	10.8	19	3.3	39	6.9
Unspecified	19	3.6	59	12.1	7	1.3	26	4.8	12	2.1	59	10.7	12	2.1	44	8.3
Pedal cyclist, other (Non-MVT related)	11	2.1	27	5.0	10	1.9	27	5.1	12	2.2	28	5.2	13	2.4	28	5.2
Natural/environmental	24	4.3	14	2.6	9	1.5	23	4.3	9	1.6	8	1.6	11	2.0	17	3.1
Other specified, not elsewhere classifiable	6	1.1	13	2.2	2	0.4	15	2.7	7	1.2	16	3.0	8	1.4	21	3.7
Machinery	2	0.3	18	3.8	-	-	15	2.7	4	0.8	14	2.6	1	0.2	27	4.9
Overexertion	13	2.5	14	2.2	3	0.6	9	1.8	3	0.5	4	0.7	1	0.2	3	0.5
Pedestrian, other (Non-MVT related)	1	0.2	6	1.2	-	-	4	0.7	4	0.7	5	0.9	2	0.4	5	0.9
Suffocation	1	0.2	3	0.5	-	-	6	1.0	2	0.4	6	1.0	2	0.4	5	0.9
Drowning/submersion	2	0.4	6	1.1	-	-	3	0.5	2	0.4	2	0.4	-	-	6	1.0
Poisoning	1	0.2	1	0.1	1	0.2	-	-	-	-	2	0.4	-	-	1	0.2
Adverse effects	1	0.2	5	1.2	-	-	-	-	-	-	-	-	-	-	-	-
Total	1016	184.4	1506*	297.0	1099	199.2	1433	297.2	1162	209.6	1777	346.3	1266	226.8	1946	382.7

*Note: Aggregating numbers by mechanism does not add up to total. In 2002, 1 male case could not be assigned a mechanism of injury due to missing an E-code (a code that helps classify injuries).



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Table 1.3: 2002-2005 Injury Hospitalization Numbers and Rate per 100,000 Population, by Mechanism, *Franklin County, OH*

	2002		2003		2004		2005	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Fall	971	101.6	1055	109.5	1206	124.1	1365	139.5
Motor vehicle traffic (MVT)	658	60.5	676	62.4	766	70.5	813	74.4
Struck by, against	198	17.8	180	15.9	260	23.1	270	24.1
Firearm	122	10.2	166	14.0	160	13.8	205	17.8
Cut/pierce	108	9.4	89	7.8	101	8.8	137	12.2
Transport, other	80	7.1	65	6.0	71	6.5	85	7.7
Fire/hot object	86	7.9	86	7.8	99	8.8	72	6.6
Other specified and classifiable	51	4.5	55	4.9	77	6.8	58	5.1
Unspecified	78	7.6	33	3.0	71	6.3	56	5.1
Pedal cyclist, other (Non-MVT related)	38	3.6	37	3.5	40	3.7	41	3.8
Other specified, not elsewhere classifiable	19	1.7	17	1.6	23	2.1	29	2.5
Machinery	38	3.4	32	2.9	17	1.6	28	2.5
Natural/environmental	20	1.9	15	1.3	18	1.6	28	2.5
Pedestrian, other (Non-MVT related)	7	0.7	4	0.4	9	0.8	7	0.7
Suffocation	4	0.4	6	0.5	8	0.7	7	0.7
Drowning/submersion	8	0.7	3	0.3	4	0.4	6	0.5
Overexertion	27	2.5	12	1.2	7	0.6	4	0.4
Poisoning	2	0.1	1	0.1	2	0.2	1	0.1
Adverse effects	6	0.6	-	-	-	-	-	-
Total	2522*	242.4	2532	242.9	2939	280.5	3212	306.3

*Note: Aggregating numbers by mechanism does not add up to total. In 2002, 1 case could not be assigned a mechanism of injury due to a missing E-code.



Section 1: 2005 Franklin County Injury Hospitalizations & Trends

Table 1.4: 2005 Injury Hospitalization Numbers and Rate per 100,000 Population, by Mechanism, *Franklin County, OH*

	Unintentional		Assault		Self-Inflicted		Undetermined		Other		Total	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Fall	1359	139.0	1	0.1	1	0.1	4	0.4	-	-	1365	139.5
Motor vehicle traffic (MVT)	812	74.3	1	0.1	-	-	-	-	-	-	813	74.4
Occupant	604	55.7	-	-	-	-	-	-	-	-	-	-
Motorcyclist	115	10.2	-	-	-	-	-	-	-	-	-	-
Pedal Cyclist	19	1.7	-	-	-	-	-	-	-	-	-	-
Pedestrian	64	5.8	-	-	-	-	-	-	-	-	-	-
Unspecified	6	5.8	-	-	-	-	-	-	-	-	-	-
Other	4	0.4	-	-	-	-	-	-	-	-	-	-
Struck by, against	85	7.8	184	16.3	-	-	-	-	-	-	270	24.1
Firearm	19	1.7	164	14.2	7	0.7	13	1.1	2	0.2	205	17.8
Cut/pierce	52	4.8	63	5.4	19	1.7	3	0.3	-	-	137	12.2
Transport, other	85	7.7	-	-	-	-	-	-	-	-	85	7.7
Fire/hot object	71	6.5	1	0.1	-	-	-	-	-	-	72	6.6
Hot Object	36	3.1	1	0.1	-	-	-	-	-	-	-	-
Fire	35	3.4	-	-	-	-	-	-	-	-	-	-
Other specified and classifiable	25	2.2	29	2.5	2	0.2	1	0.1	1	0.1	58	5.1
Unspecified	20	1.8	34	3.1	-	-	2	0.2	-	-	56	5.1
Pedal cyclist, other (Non-MVT related)	41	3.8	-	-	-	-	-	-	-	-	41	3.8
Other specified, not elsewhere classifiable	13	1.2	13	1.1	2	0.2	1	0.1	-	-	29	2.5
Machinery	28	2.5	-	-	-	-	-	-	-	-	28	2.5
Natural/environmental	27	2.4	-	-	-	-	1	0.1	-	-	28	2.5
Bite/Sting	21	1.9	-	-	-	-	-	-	-	-	21	-
Pedestrian, other (Non-MVT related)	7	0.7	-	-	-	-	-	-	-	-	7	0.7
Suffocation	1	0.1	1	0.1	5	0.4	-	-	-	-	7	0.7
Drowning/submersion	6	0.5	-	-	-	-	-	-	-	-	6	0.5
Overexertion	4	0.4	-	-	-	-	-	-	-	-	4	0.4
Poisoning	-	-	-	-	1	0.1	-	-	-	-	1	0.1
Adverse effects	-	-	-	-	-	-	-	-	-	-	-	-
Total	2655	257.4	491	42.9	37	3.4	25	2.1	4	0.4	3212	306.3



SECTION II:
2005 Franklin County Unintentional
Injury Hospitalizations & Trends

- A. Falls
- B. Motor Vehicle Crashes

Section 2a: 2005 Unintentional Fall Injury Hospitalizations & Trends

Introduction

There were 1,359 people in Franklin County hospitalized for at least 48 hours due to a fall. This is a large increase from previous years (Table 2.2). In 2002, there were 967 people hospitalized for an injury related to a fall. In 2005 that number is 41% higher (1,359). This is nearly 4 people per day. The increase in fall-related trauma may reflect an aging population since a substantial proportion of these cases occurs in older adults: in 2005, 506 people age 75 or older had fall-related injury hospitalizations, which is 37% of all fall-related hospitalizations. The vast majority of these injuries occur in females. Of the 506 hospitalizations in the 75+ age group, 74% were female.

The other age group disproportionately impacted by falls is the 0-14 age group. In this age group males are at increased risk; 61% of all 0-14 cases are male.

The average rate of fall-related trauma for years 2002-05 is 118.6 per 100,000. Zip code rates range from 96 per 100,000 in zip code 43228, to 155 in zip codes 43110 and 43203. The next highest zip code for fall-related trauma is 43201 with 144 per 100,000.

Fall-related hospitalizations are also costly. The medical costs are \$17,841 per person for each hospitalization according to a recent study on the economic burden of injuries.² When lost productivity is taken into account the cost is \$39,467 per incident. Therefore the total cost of fall injuries in Franklin County

is at least \$53,635,653. The cost is actually higher because this data does not include hospitalizations for less than 48 hours. This data indicates that it could be extremely cost effective to reduce fall injuries and that interventions may be most effectively implemented to impact older women (75 and older) and young males (0-14 years of age) in zip codes 43110, 43201 and 43203.

Fall injuries are also categorized by the physical location where the fall occurred. The geographic location for residents experiencing fall-related injury hospitalization is fairly uniform throughout the county. Falls resulting in injury hospitalization most often occur in the home. In Franklin County, from 2002-2005, there were 4,573 fall-related injury hospitalizations and over 57% (2619) occurred in the home. Over 10% (472) occurred in a residential facility such as a nursing home. Contributors to falls in the home are numerous: slippery floors and rugs; no hand rails or loose handrails on stairs; poor lighting; and medications that cause disorientation or light headedness. In order to be effective, prevention programs must address these issues and should make people---especially seniors---aware of hazards in the home.

- In 2005, falls were the number one cause of all injury hospitalizations, with over 99.5% being unintentional
- In 2005 there were 1,359 unintentional falls requiring 48 hours or more of hospitalizations (a rate of 139.0 per 100,000 population)
- There were, on average, 3.7 unintentional fall hospitalizations per day among Franklin County residents in 2005
- On average, the number and rate of unintentional fall injury hospitalizations has increased by 12.0 and 11.1 percent respectively every year from 2002 through 2005

Demographics

- In 2005, approximately 54% of unintentional fall injuries requiring 48 hours or more of hospitalization were females
- On average, the number and rate of male unintentional fall injury hospitalizations have increased 13.4% and 13.0% respectively, while female unintentional fall injury increased 11.2% and 10.3% respectively, every year from 2002 through 2005
- In 2005, the age groups with the greatest number and percentage of unintentional fall injury hospitalizations include the 75+ (37% of total) and 45-64 (24% of total) year old groups
- In 2005 females aged 75+ years made up approximately 28% of the total unintentional fall injury hospitalizations



Section 2a: 2005 Unintentional Fall Injury Hospitalizations & Trends

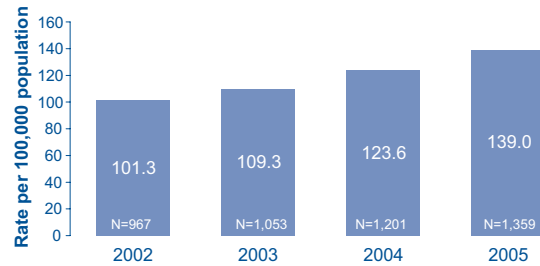


Figure 2.1: 2002-05 Rates of Unintentional Fall Injury Hospitalization per 100,000 Population by Year, *Franklin County, OH*

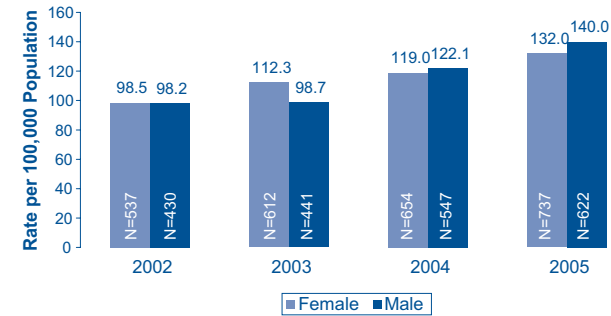


Figure 2.2: 2002-05 Rates of Unintentional Fall Injury Hospitalization per 100,000 Population by Gender and Year, *Franklin County, OH*

Table 2.1: 2005 Number and Rate of Unintentional Fall Injury Hospitalizations by Gender and Age Group, *Franklin County, OH*

	Female		Male		Total	
	Number	Rate	Number	Rate	Number	Rate
00-04	20	48.9	41	95.7	61	72.8
05-14	40	54.8	53	70.0	93	62.5
15-24	10	12.9	46	57.0	56	35.4
25-44	53	31.3	98	56.7	151	44.1
45-64	150	114.0	175	146.9	325	129.6
65-74	90	293.8	77	324.9	167	307.4
75+	374	1107.2	132	695.3	506	959.0
Total	737	132.0	622	140.0	1359	139.0



Section 2a: 2005 Unintentional Fall Injury Hospitalizations & Trends

Types and Location of Falls

- From 2002 through 2005, *falls on the same level due to slipping, tripping, or stumbling* accounted for the largest percentage of unintentional fall hospitalizations (38%)
- On average, the number and rate of *falls on the same level due to slipping, tripping, or stumbling* have consistently increased (18% and 17% respectively per year), every year from 2002 through 2005
- *Falls from one level to another levels* and *falls on stairs* have also consistently increased every year from 2002 through 2005
- From 2002 through 2005, most falls occur in the home (57.3%) or a residential facility (10.3%)

Geography

- From 2002-2005, the top 5 residence zip code geographic areas with the highest average *number* of unintentional fall injury hospitalizations include 43224, 43110, 43209, 43223 and 43219
- From 2002-2005, the top 5 residence zip code geographic areas with the highest average *rate* of unintentional fall injury hospitalizations are 43110, 43203, 43201, 43211 and 43229

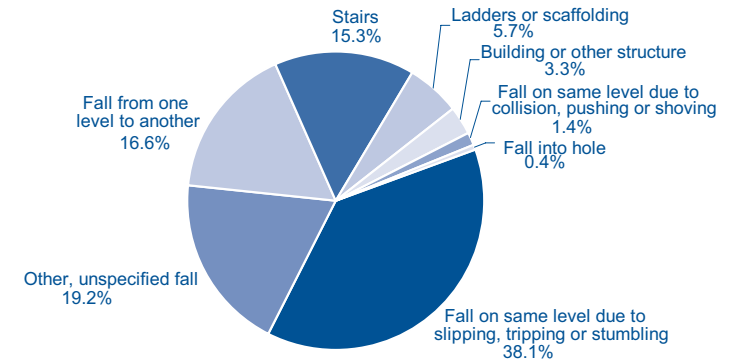


Figure 2.3: Percentage of Unintentional Fall Related Hospitalizations by Type of Fall, *Franklin County, OH*, 2002-2005 (N=4,580)

	2002		2003		2004		2005	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Fall on same level due to slipping, tripping or stumbling	971	101.6	1055	109.5	1206	124.1	1365	139.5
Fall from one level to another	198	17.8	180	15.9	260	23.1	270	24.1
Other, unspecified Fall	250	26.7	185	20.0	219	23.4	225	23.8
Stairs	144	15.1	153	15.8	185	18.9	217	21.9
Ladders or scaffolding	55	5.4	70	6.8	66	6.3	72	7.0
Building or other structure	32	2.9	43	3.9	41	3.7	34	3.1
Fall on the same level due to collision, pushing or shoving	14	1.2	18	1.6	13	1.2	18	1.6
Hole*	7	0.7	5	0.5	3	0.3	5	.04
Total	976	101.3	1,053	109.3	1201	123.6	1,359	139.0

Table 2.2: 2002-2005 Unintentional Fall Injury Hospitalization Numbers and Rates per 100,000 Population by Type of Fall, *Franklin County, OH* *Includes falls as a result of diving or jumping into water; falling into well, stormdrain or manhole; or other hole or opening surface.



Section 2a: 2005 Unintentional Fall Injury Hospitalizations & Trends

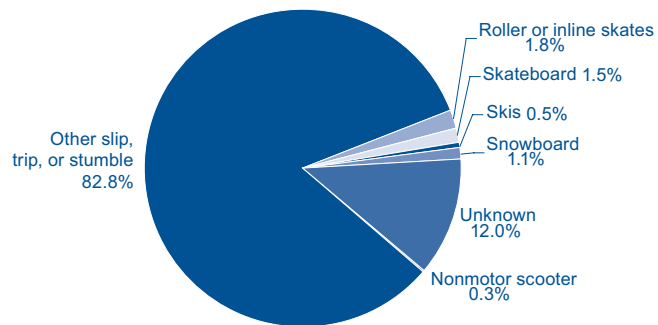


Figure 2.4: Percentage of Unintentional Fall Hospitalizations From Slipping, Tripping, or Stumbling on Same Level by Sub-type, *Franklin County, OH, 2002-2005* (N=1,746)

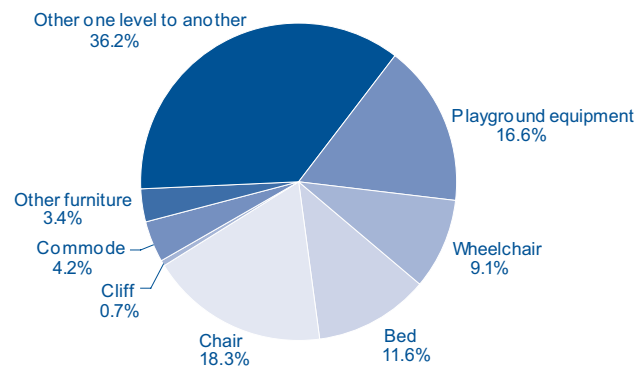


Figure 2.5: Percentage of Unintentional Fall Hospitalizations from One Level to Another Level by Sub-type, *Franklin County, OH, 2002-2005* (N=760)

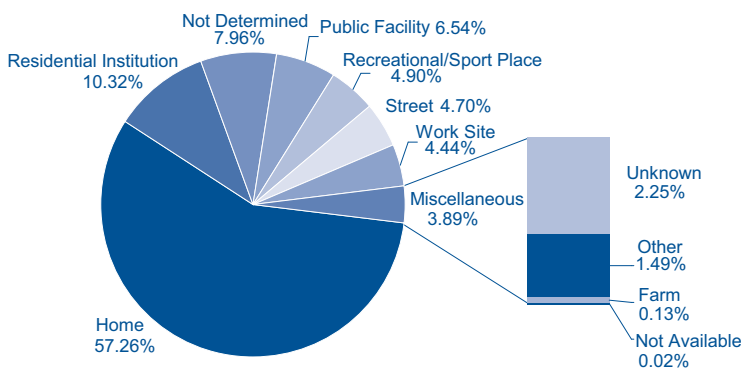


Figure 2.6: Percentage of Unintentional Fall Related Hospitalizations by Location of Fall, *Franklin County, OH, 2002-2005* (N=4,574)

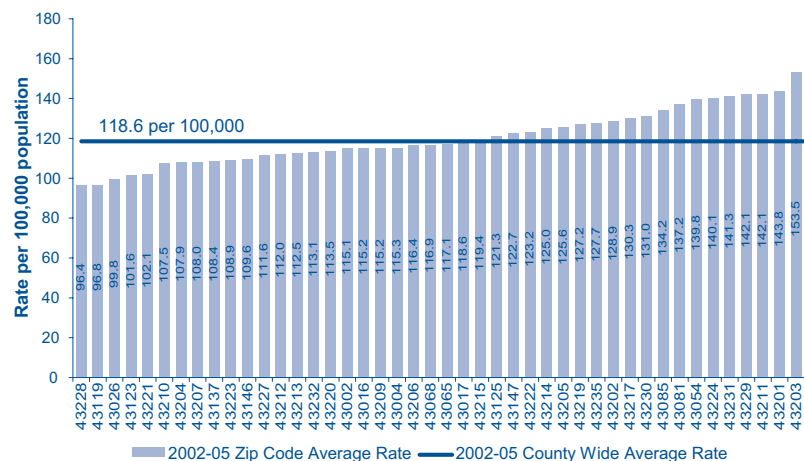


Figure 2.7: 2002-05 Average Rates of Unintentional Fall Injury Hospitalization per 100,000 Population by Zip Code of Residence, *Franklin County, OH*



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Introduction

As with fall-related injury hospitalizations, there is a substantial increase in the number and rate of trauma cases from motor vehicle incidents. In 2005 there were 812 Franklin County residents hospitalized 48 hours or longer as a result of a motor vehicle crash. In 2004 there were 764, which is nearly a 7% increase in one year. The rate per 100,000 residents also increased from 70 per 100,000 in 2004 to 74 in 2005—a 6% increase. According to Figure 2.9, in 2003 there was a decline in the number and rate of male injury hospitalizations from motor vehicle trauma compared to 2002. In 2005, males were 60% more likely to be hospitalized for 48-hours or longer from a motor vehicle crash than females.

According to Table 2.3, the age group most at risk for motor vehicle-related injury hospitalization is 15-24 year olds with a rate of 127 per 100,000. This rate is 72% higher than the overall rate. The county-wide rate of injury hospitalizations from motor vehicle injuries over the 4 year period of 2002-2005 was 67 per 100,000. Residents most at risk live in zip codes 43222, 43217 and 43203, where the rates were 58%-67% higher.

The number and rate of motorcycle-related injury hospitalizations increased substantially between 2002 and 2005, nearly doubling from 5.7 per 100,000 to 10.1. **However, pedestrian-related hospitalizations declined in the same period, going from 8.0 per 100,000 in 2002 to 5.8 in 2005—a 28% reduction.**

Interventions focused toward teen and young adult males in the high risk zip codes may be the most effective way to impact motor vehicle-related injury hospitalizations. Interventions that include incentives and education regarding use of safety devices such as seat belts and helmets should be considered. The age group at highest risk is 15-24 and the highest risk zip codes are 43203, 43217 and 43222. The 2005 motor vehicle fatality data indicates there were 83 traffic fatalities in Franklin County as a result of 82 fatal crashes. Alcohol was involved in 25 (30%) of fatal crashes. Of the total fatalities, 72% (60) were drivers or passengers (occupants); 18% (15) were pedestrians; and 8% (7) were motorcyclists.³

The cost of motor vehicle hospitalizations alone justifies attention to preventive interventions. The average medical cost of a motor vehicle related injury hospitalization is \$26,690 per case and the average productivity losses are \$56,118 per case. This equates to a total cost of \$82,808 per motor vehicle-related hospitalization.¹ The economic cost of motor vehicle related injury hospitalizations in Franklin County was at least \$67,240,096 in 2005. The total economic cost, (including productivity losses and lifetime medical cost) of the 83 fatalities in 2005 was \$88,967,011. The total losses in our community attributable to motor vehicle crashes in 2005 were over \$156,000,000.² The actual costs and losses may be higher because our case numbers include only 48-hour injury hospitalizations and do not account for hospitalizations with less than a 48-hour length of stay.

- In 2005, motor vehicle traffic crashes were the number two cause of all injury hospitalizations, with over 99.9% being unintentional
- In 2005 there were 812 unintentional motor vehicle traffic crash cases requiring 48 hours or more of hospitalizations (a rate of 74.3 per 100,000 population)
- There were, on average, 2.2 unintentional motor vehicle traffic crash hospitalizations per day among Franklin County residents in 2005
- On average, the number and rate of unintentional motor vehicle traffic crash injury hospitalizations has increased by 7.5 and 7.3 percent respectively every year from 2002 through 2005



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Demographics

- In 2005, males made up approximately 62% of unintentional MVT crash injuries requiring 48 hours or more of hospitalizations
- On average, the number and rate of male unintentional MVT crash injury hospitalizations have increased 10.0% and 10.2% respectively, while females increased 5.6% and 5.8% respectively, every year from 2002 through 2005
- In 2005, the age groups with the greatest number and percentage of unintentional MVT crash injury hospitalizations include the 25-44 (35% of total) year olds, while the highest rate is in the 15-24 (127.0 per 100,000) year old group. In 2000, the national average for the 15-24 age group for all hospitalizations including less than 48-hours was 216 per 100,000 for males and 120 per 100,000 for females
- In 2005, males between 15 and 64 years old made up over 50% of the total unintentional motor vehicle traffic crash injury hospitalizations

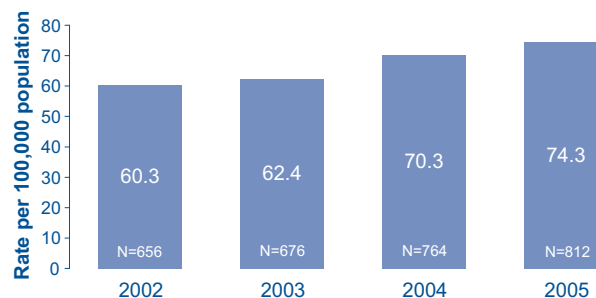


Figure 2.8: 2002-05 Rates of Unintentional MVT Crash Injury Hospitalization per 100,000 Population by Year, *Franklin County, OH*

Table 2.3: 2005 Number and Rate of Unintentional MVT Crash Injury Hospitalizations by Gender and Age Group, *Franklin County, OH*

	Female		Male		Total	
	Number	Rate	Number	Rate	Number	Rate
00-04	5	12.2	9	21.0	14	16.7
05-14	14	19.2	19	25.1	33	22.2
15-24	82	105.7	119	147.5	201	127.0
25-44	92	54.3	190	109.9	282	82.4
45-64	69	52.4	108	90.6	177	70.6
65-74	25	81.6	27	113.9	52	95.7
75+	24	71.0	28	147.5	52	98.6
Total	311	55.9	501	94.7	812	74.3



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Geography

- From 2002-2005, the top 5 residence zip code geographic areas with the highest average number of unintentional motor vehicle traffic crash injury hospitalizations are 43223, 43219, 43123, 43110 and 43209
- From 2002-2005, the top 5 residence zip code geographic areas with the highest average rate of unintentional motor vehicle traffic crash injury hospitalizations include 43322, 43217, 43203, 43205 and 43206

Person Injured

- From 2002 through 2005, motor vehicle *occupants* (drivers and passengers) accounted for the largest percentage of unintentional MVT crash hospitalizations (74%)
- On average, the number and rate of *motorcyclists* hospitalized consistently increased (21.6% and 21.5% respectively per year), every year from 2002 through 2005
- Nearly twice as many motorcycle crash victims were hospitalized in 2005 from trauma injuries than were hospitalized for the same in 2002
- The number and rate of motor vehicle *occupants* hospitalized have also consistently increased every year from 2002 through 2005

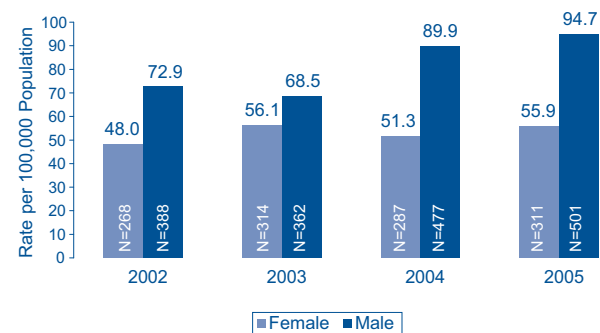


Figure 2.9: 2002-05 Rates of Unintentional MVT Crash Injury Hospitalization per 100,000 Population by Gender and Year, *Franklin County, OH*

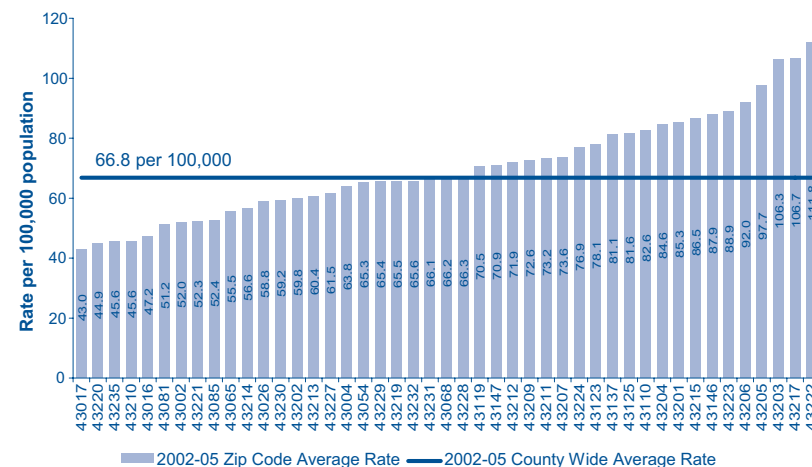


Figure 2.10: 2002-05 Average Rates of Unintentional Motor Vehicle Traffic Crash Injury Hospitalization per 100,000 Population by Zip Code of Residence, *Franklin County, OH*



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

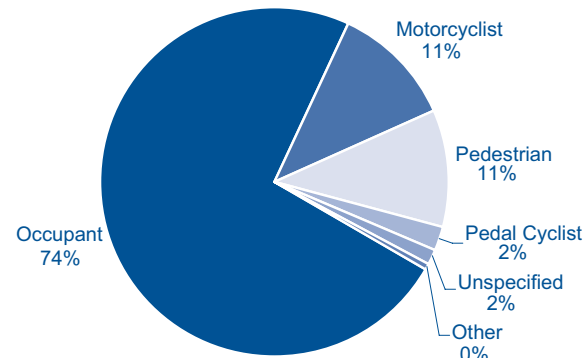


Figure 2.11: Percentage of Unintentional MVT Crash Related Hospitalizations by Person Injured, *Franklin County, OH, 2002-2005 (N=2,907*)*

*There were a total of 2,908 Unintentional MVT Crash hospitalizations from 2002-2005. One Unintentional MVT Crash hospitalization was not assigned an E-code due to missing information.

Table 2.4: 2002-2005 Unintentional MVT Crash Injury Hospitalization Numbers and Rates per 100,000 population, by Person Injured, *Franklin County, OH*

	2002		2003		2004		2005	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Occupant	481	44.4	492	45.5	561	51.8	604	55.7
Motorcyclist	65	5.7	72	6.3	82	7.4	115	10.2
Pedestrian	86	8.0	79	7.5	86	7.9	64	5.8
Pedal Cyclist	13	1.2	12	1.1	18	1.7	19	1.7
Unspecified	8	0.7	18	1.6	13	1.2	6	0.5
Other	2	0.2	3	0.3	4	0.4	4	0.4
Total	656*	60.3	676	62.4	764	70.3	812	74.3

* Note: Aggregating numbers by mechanism does not add up to total. In 2002, 1 case was not assigned an E code due to missing information.

Safety Device Used

Seat belts, air bags, child car seats, motorcycle and bicycle helmets are all effective ways to prevent or reduce the severity of injuries in a motor vehicle crash. Figures 2.12-2.14 indicate the percent of MVC related injury hospitalizations using different safety devices. Central Ohio has an average seat belt use rate of 71% yet those involved in serious injury crashes requiring hospitalization for 48 hours or longer had seat belt use rates of around 55%. Research shows that the use of lap and shoulder belts by front seat occupants reduces the risk of moderate to severe injury by 50%, and reduces the risk of fatality by 45%.^{4, 5}

Motorcyclists and bicyclists severely injured in a crash were not wearing a helmet much of the time. In 2005 44% of hospitalized motorcyclists and 58% of bicyclists were not wearing a helmet. Research illustrates that motorcycle helmets are 29% effective in preventing fatality in a crash.⁶

- From 2003 through 2005, approximately 38% of hospitalized motor vehicle crash *occupants* (drivers and passengers) were documented as not using their seat belt
- On average, the percentage of hospitalized *occupants* of a motor vehicle traffic crash who were documented as using their seat belt has consistently decreased (3.7% per year) every year from 2003 through 2005
- From 2003 through 2005, approximately 41% of hospitalized *motorcyclists* were documented as not using a helmet
- From 2003 through 2005, approximately 65% of bicyclists were documented as not wearing a helmet

Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Traumatic Brain Injury

Traumatic brain injuries (TBI) are caused by an external force to the head that results in physical, psychosocial and/or cognitive impairment. TBI can precipitate lifelong mental and physical disabilities, or death. In 2003 there were 214 Franklin County residents with motor vehicle crash-related TBI. In 2005 there were 310 such cases, which is a 45% increase. Similarly, there was a 42% increase in the rate of TBI among motor vehicle crash injury hospitalizations between 2003 and 2005. The 15-24 age group has the highest rate of injury hospitalizations. This age group also has the highest rate of TBI (53 per 100,000)---nearly twice the rate of all other age groups combined.

TBI are costly. Nationally, in 2000, the medical cost of hospitalization for an injury averaged \$18,040. The medical cost of TBI hospitalizations averaged \$51,184, nearly three times the cost of other types of injuries.² The potential long term consequences of TBI lead to significant and costly productivity losses, especially for younger age groups.

- Among the 812 hospitalized Franklin County resident survivors of an unintentional motor vehicle traffic crash in 2005, 38% or 310 were severe enough to cause traumatic brain injury
- On average, the number and rate of Franklin County residents hospitalized as a result of a motor vehicle traffic crash and severe enough to cause traumatic brain injury have both increased 17% every year from 2002 through 2005

- On average, both the number and rate of male TBI cases among those hospitalized due to a MVT crash has increased 22% every year between 2002 through 2005. Female numbers and rates have also increased, but not as intensely (12% per year every year between 2002 through 2005)
- From 2002 through 2005, the age group with the highest number of TBI cases is the 25-44 year age group, while the highest rates belong to the 15-24 year age group
- Among persons hospitalized for a MVT related crash, occupants of a motor vehicle have the highest number and rate of TBI
- The rates of TBI in persons 75+ years in a motor vehicle crash have more than doubled between 2002 and 2005
- The frequency and rate of TBI among motorcyclists have increased over the past couple of years. See Table 2.6 on page 19

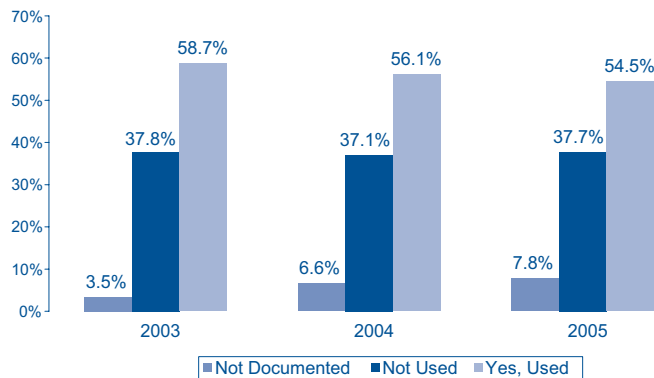


Figure 2.12: Percentage of Unintentional MVT Crash Related Hospitalizations among Motor Vehicle Occupants by Seat-Belt Use and Year, Franklin County, OH, 2003-2005

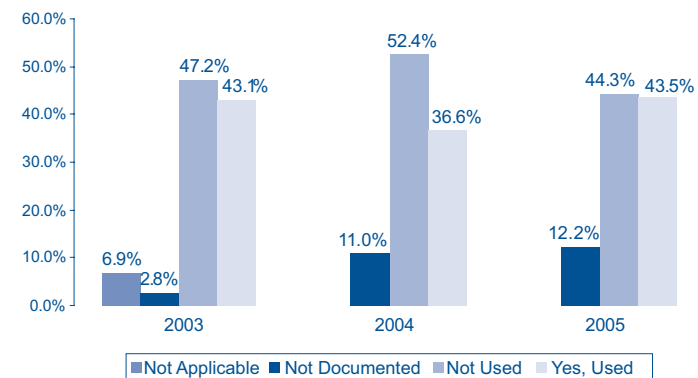


Figure 2.13: Percentage of Unintentional MVT Crash Related Hospitalizations among Motorcyclists by Helmet Use and Year, Franklin County, OH, 2003-2005



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Unintentional MV Crash Hospitalizations, Safety Device Use and Traumatic Brain Injury

Not using a seat belt and motorcycle helmet increase the risk of TBI. Only 42% of TBI hospitalizations were wearing a seat belt. Only 21% of motorcyclists with TBI were wearing a helmet.

- Compared to all unintentional MVT crash related occupant hospitalizations from 2002-2005, the percentage of seat-belt use is lower among occupants with TBI (56% vs. 42%)
- Compared to all unintentional MVT crash related motorcyclist hospitalizations from 2002-2005, the percentage of helmet use is lower among motorcyclists with TBI (41% vs. 21%)

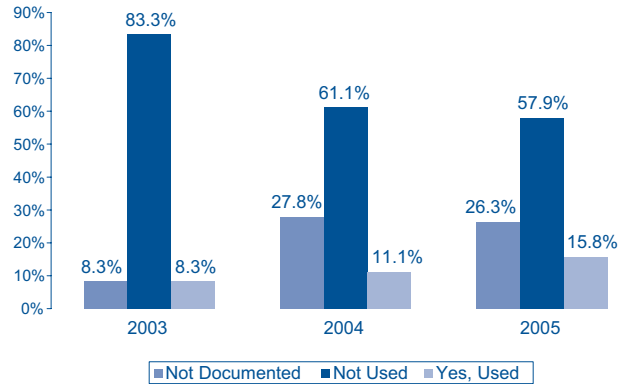


Figure 2.14: Percentage of Unintentional MVT Crash Related Hospitalizations among Bicyclists by Helmet Use and Year, *Franklin County, OH, 2003-2005*

Table 2.5: Number and Rate of Traumatic Brain Injury Hospitalizations associated with a MVT Crash by Year and Age Group, *Franklin County, OH, 2002-2005*

	2002		2003		2004		2005	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
00-04	5	6.2	6	7.4	4	4.8	5	6.0
05-14	15	10.0	11	7.3	17	11.4	10	6.7
15-24	52	31.9	59	36.5	85	53.4	84	53.1
25-44	79	22.4	71	20.3	105	30.4	121	35.4
45-64	33	14.3	49	20.7	68	27.9	60	23.9
65-74	10	18.2	11	20.0	11	20.2	14	25.8
75+	6	12.0	7	13.7	17	32.8	15	28.4
Total	200	18.1	214	19.6	307	27.8	310	27.9

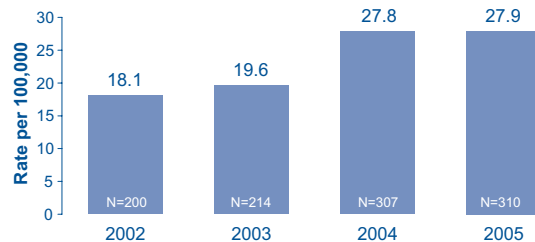


Figure 2.15: Rate of Traumatic Brain Injury Hospitalizations associated with a MVT Crash by Year, *Franklin County, OH, 2002-2005*

*One case in the 2005 TBI data was missing age information, thus data does not add up to total.



Section 2b: 2005 Unintentional Motor Vehicle Traffic Crashes Injury Hospitalizations & Trends

Table 2.6: Number and Rate of Traumatic Brain Injury Hospitalizations associated with a MVT Crash by Person and Year, *Franklin County, OH, 2002-2005*

	2002		2003		2004		2005	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Occupant	146	13.2	163	14.9	227	20.6	229	20.7
Motorcyclist	22	1.9	20	1.8	27	2.3	43	3.7
Pedestrian	25	2.3	21	2.0	37	3.4	28	2.5
Pedal Cyclist	5	0.5	4	0.4	8	0.7	7	0.6
Other	-	-	1	0.1	3	0.3	2	0.2
Unspecified	2	0.2	5	0.5	5	0.5	1	0.1
Total	200	18.1	214	19.6	307	27.8	310	27.9

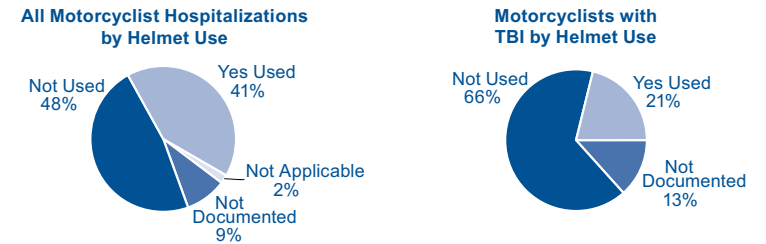


Figure 2.17: Percentage of Helmet Use Status for All MVT Crash Motorcyclist Hospitalizations and Motorcyclists resulting in Traumatic Brain Injury, *Franklin County, OH, 2002-2005*

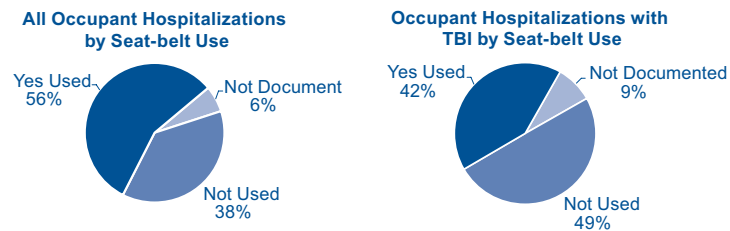


Figure 2.16: Percentage of Seat-belt Use Status for All MVT Crash Occupant Hospitalizations and Occupants Resulting in Traumatic Brain Injury, *Franklin County, OH, 2002-2005*

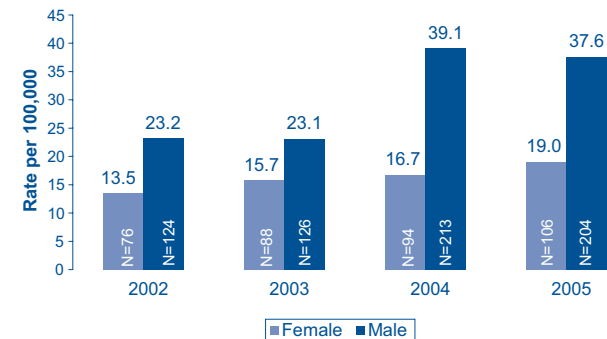


Figure 2.18: Rate of Traumatic Brain Injury Hospitalizations associated with a MVT Crash by Gender and Year, *Franklin County, OH, 2002-2005*





SECTION III:
2005 FRANKLIN COUNTY ASSAULT
INJURY HOSPITALIZATIONS & TRENDS

Section 3: 2005 Franklin County Assault Injury Hospitalizations & Trends

Introduction

Assault injuries are a type of *intentional injury*. An intentional injury is committed with actions by an individual or group with intent on harming another person or persons. There are a number of mechanisms for inflicting intentional harm including firearms, fists, blunt objects, knives, or other ways to inflict harm such as pushing someone off a high place or using a vehicle or air gun. In Franklin County the most common mechanisms for intentionally caused injury hospitalizations are firearms, fists, and blunt force or thrown objects.

The number of assault-related 48-hour hospitalizations has increased an average of 16% per year. In 2004 there were 469 compared to 491 in 2005. However in 2002 and 2003, there were 316 and 351 assault related hospitalizations respectively. The number increased by 55% from 2002 to 2005. Although males sustained six times the number of serious assault injuries in 2005, females account for a greater part of the increase in numbers. The average increase for males between 2002 and 2005 was 15% while the average increase for females was 24%.

According to Table 3.3, the primary mechanism for assault injuries is firearms. In 2004 and 2005 firearms caused 31% of assault injury hospitalizations. Unarmed fights were the cause of 21% and blunt objects accounted for 17% of assault-related hospitalizations.

In 2005, the age group most at risk for assault was the 15-24 year old range. They accounted for 28% of all assault hospitalizations. Although the 25-44 year old age group had a larger number of hospitalizations (233, 47%) the rate

per 100,000 was 68 compared to 85 for the 15-24 year olds.

Geographically there are several zip codes where residents seem to have a higher risk of serious assaults. The overall county rate in 2005 was 35 per 100,000 persons. High risk zip codes range from 72 per 100,000 residents in 43201 to 116 in 43203 (two to three times the county rate).

The costs of assault injury hospitalizations are significant. A recent publication estimated the medical costs alone for firearm related hospitalizations at \$36,779 per case and blunt force ("struck by") cases at \$17,202.² In Franklin County, the medical costs for these two mechanisms total over \$7.4 million in year 2000 dollars.

The Columbus community is addressing assault injury prevention from several perspectives including after-school programs, increased law enforcement, domestic violence prevention, job programs, and gang intervention programs. It is apparent that these services would be most efficiently implemented by focusing efforts in specific geographic areas. Research indicates that victims of violence and perpetrators often have similar demographic characteristics and usually know each other, therefore prevention programs should also focus on populations with demographics similar to those of the people hospitalized.⁷

• In 2005, there were 491 assault injury hospitalizations requiring 48 hours or more of hospitalizations (a rate of 42.9 per 100,000 population)

- There were, on average, 1.3 assault hospitalizations per day among Franklin County residents in 2005
- On average, the number and rate of assault injury hospitalizations has increased 16% and 17% per year respectively, every year from 2002 through 2005

Demographics

- In 2005, males made up approximately 85% of assault injuries requiring 48 hours or more of hospitalizations
- On average, both the number and rate of male assault injury hospitalizations have increased around 15%, while females increased around 24%, every year from 2002 through 2005
- In 2005, the age groups with the greatest number and percentage of total assault injury hospitalizations are 25-44 (233 out of 491 total, 47%) year olds, while the highest rate of assault injury hospitalizations are in the 15-24 year olds (84.7 per 100,000)
- In 2005, males between 15 and 44 years old made up over 63% of the total assault injury hospitalizations



Section 3: 2005 Franklin County Assault Injury Hospitalizations & Trends

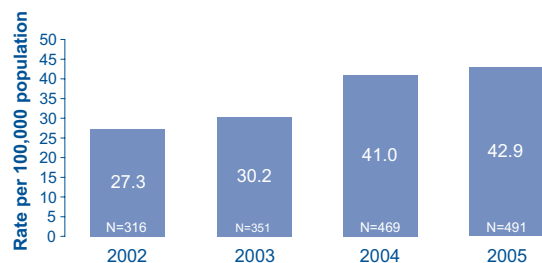


Figure 3.1: 2002-05 Rates of Assault Injury Hospitalization per 100,000 Population by Year, *Franklin County, OH*

Table 3.1: 2005 Number and Rate of Assault Injury Hospitalizations by Gender and Age Group, *Franklin County, OH*

	Female		Male		Total	
	Number	Rate	Number	Rate	Number	Rate
00-04	8	19.5	7	16.3	15	17.9
05-14	1	1.4	10	13.2	11	7.4
15-24	15	19.3	119	147.5	134	84.7
25-44	42	24.8	191	110.5	233	68.1
45-64	9	6.8	83	69.7	92	36.7
65-74	-	-	1	4.2	1	1.8
75+	1	3.0	4	21.1	5	9.5
Total	76	13.2	415	73.1	491	42.9

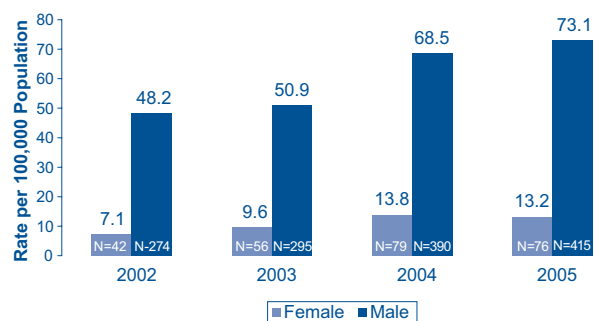


Figure 3.2: 2002-05 Rates of Assault Injury Hospitalization per 100,000 Population by Gender and Year, *Franklin County, OH*



Section 3: 2005 Franklin County Assault Injury Hospitalizations & Trends

Geography

- From 2002-2005, the top 5 residence zip code geographic areas with the highest average number of assault injury hospitalizations include 43209, 43219, 43215, 43223 and 43206
- From 2002-2005, the top 5 residence zip code geographic areas with the highest average rate of assault injury hospitalizations include 43203, 43205, 43222, 43206 and 43215

Types of Assault

- The top three types of assault injury hospitalizations among Franklin County residents in 2005 are Assaults related to *firearms or explosives* (33% of total, 164 of 491) and *unarmed fight or brawl* (21% of total, 104 of 491), which together accounted for over 50% (268 of 491) of the total number of injuries requiring two or more days of hospitalization
- On average, the number and rate of *firearms or explosive* related assault injury hospitalizations have increased 26% and 27% respectively a year, every year from 2002 through 2005. This means that the number and rate of firearm assaults requiring injury hospitalization has nearly doubled between 2002 and 2005 in Franklin County
- On average, the number and rate of *unarmed fight or brawl* related assault injury hospitalizations have increased 15% and 14% per year, every year from 2002 through 2005
- The number and rate of child and adult abuse cases requiring injury hospitalization has also nearly doubled between 2002 and 2005

Figure 3.3: 2002-05 Average Rates of Assault Injury Hospitalization per 100,000 Population by Zip Code of Residence, *Franklin County, OH*

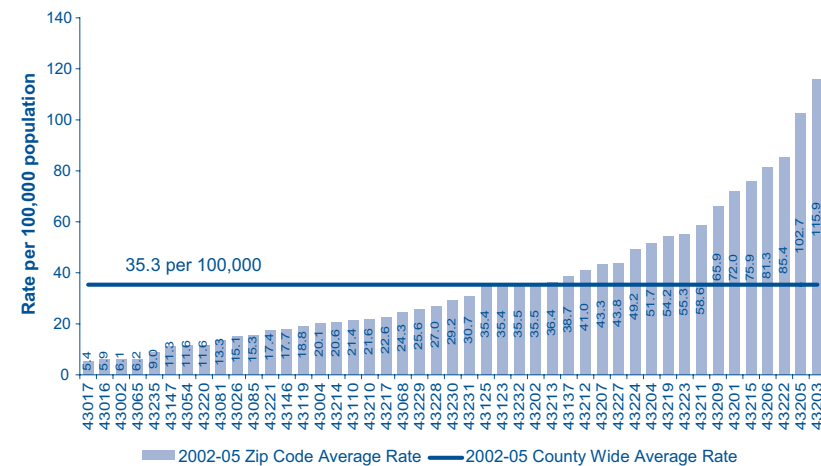
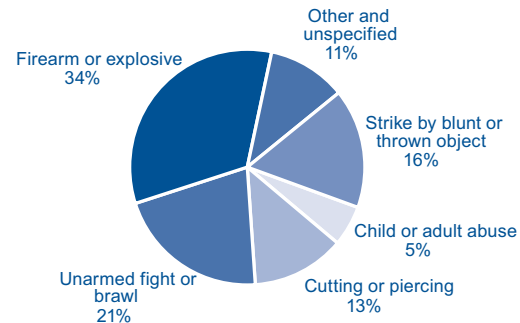


Figure 3.4: Percentage of Assault Related Hospitalizations by Type of Assault, *Franklin County, OH, 2005* (N=491)



Section 3: 2005 Franklin County Assault Injury Hospitalizations & Trends

Table 3.2: 2005 Number and Percent of Assault Injury Hospitalizations by Major Types, Gender, and Age Group, *Franklin County, OH*

Attribute	All Assaults	Firearms or Explosives	Unarmed Fight or Brawl	Strike by Blunt or Thrown Object	Cutting or piercing instrument	Child or Adult Abuse	Other and Unspecified
Total Number	491	164	104	80	63	27	53
Gender	Number & Percent of Category Total						
Males	415 (85%)	148 (90%)	91 (88%)	62 (78%)	56 (89%)	11 (41%)	47 (89%)
Females	76 (15%)	16 (10%)	13 (12%)	18 (22%)	7 (11%)	16 (59%)	6 (11%)
Age Group	Number & Percent of Category Total						
00-04	15 (3.1%)	1 (0.6%)	0 (0%)	0 (0%)	0 (0%)	14 (51.9%)	0 (0%)
05-14	11 (2.2%)	1 (0.6%)	8 (7.7%)	0 (0%)	0 (0%)	1 (3.7%)	0 (0%)
15-24	134 (27.3%)	77 (47%)	18 (17.3%)	13 (16.3%)	16 (25.4%)	4 (14.8%)	7 (13.2%)
25-44	233 (47.5%)	73 (44.5%)	49 (47.1%)	46 (57.5%)	39 (61.9%)	5 (18.5%)	21 (39.6%)
45-64	92 (18.7%)	11 (6.7%)	28 (26.9%)	19 (23.8%)	8 (12.7%)	2 (7.4%)	24 (45.3%)
65-74	1 (0.2%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
75+	5 (1%)	1 (0.6%)	0 (0%)	2 (2.5%)	0 (0%)	1 (3.7%)	1 (1.9%)



Section 3: 2005 Franklin County Assault Injury Hospitalizations & Trends

Table 3.3: 2002-2005 Number and Rate of Assault Injury Hospitalizations by Type of Assault and Year, *Franklin County, OH*

	2002		2003		2004		2005	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Firearm or explosive	88	7.3	138	11.5	130	11.2	164	14.2
Other and Unspecified firearm	36	3.0	54	4.5	78	6.8	86	7.6
Handgun	43	3.8	75	6.2	49	4.1	74	6.4
Shotgun	4	0.4	7	0.6	1	0.1	1	0.1
Antipersonnel bomb	-	-	1	0.1	-	-	-	-
Hunting Rifle	1	0.1	-	-	-	-	-	-
Military Firearm	1	0.1	-	-	1	0.1	-	-
Unspecified explosive	-	-	1	0.1	1	0.1	-	-
Unarmed fight, brawl, other	72	6.5	69	6.1	99	8.7	104	9.2
Unarmed fight or brawl	71	0.1	67	0.2	98	0.1	104	
Other	1	6.4	2	5.9	1	8.6		9.2
Strike by blunt or thrown object	52	4.5	42	3.7	86	7.6	80	7.1
Cutting or piercing instrument	44	3.8	43	3.7	50	4.3	63	5.4
Other and unspecified	45	3.9	35	3.1	60	5.2	49	4.4
Unspecified	31	2.6	22	1.9	47	4.1	34	3.1
Other Specified	8	0.7	8	0.7	7	0.6	10	0.9
Human bite	3	0.3	3	0.3	3	0.3	2	0.2
Hot liquid	-	-	-	-	-	-	1	0.1
Pushing from high place	-	-	-	-	1	0.1	1	0.1
Transport vehicle	-	-	-	-	1	0.1	1	0.1
Air gun	-	-	1	0.1	1	0.1	-	-
Fire	3	0.2	1	0.1	-	-	-	-
Child or adult abuse	14	1.2	23	2.0	41	3.6	27	2.3
Unspecified person	9	0.8	10	0.9	34	3.0	17	1.4
Spouse or partner	3	0.2	8	0.7	2	0.2	5	0.5
Father, stepfather, boyfriend	2	0.2	1	0.1	2	0.2	5	0.5
Child	-	-	2	0.2	-	-	1	0.1
Mother, stepmother, girlfriend	-	-	-	-	1	0.1	1	0.1
Sibling	-	-	1	0.1	-	-	1	0.1
Non-related caregiver	-	-	1	0.1	-	-	-	-
Other specified person	-	-	-	-	2	0.2	-	-
Late effects of injury	-	-	1	0.1	1	0.1	3	0.2
Hanging or strangulation	1	0.1	-	-	2	0.2	1	0.1
Total	316	27.3	351	30.2	469	41.0	491	42.9



SECTION IV:
2005 COTS REGIONAL INJURY
HOSPITALIZATIONS & TRENDS

Section 4: 2005 COTS Regional Injury Hospitalizations & Trends

Introduction

The COTS region continues to expand. In 2005, 22 hospitals in 14 counties across Central Ohio submitted trauma reports to COTS. This compares with 18 hospitals in 2002. In 2005, reports from Franklin County make up 39% of all reports compared to 2002 where Franklin County accounted for half (49%) of all reports.

- In 2005, there were 8,186 total injuries requiring 48 hours or more of hospitalizations, equal to about 22 per day or nearly 1 every hour throughout the COTS region
- On average, the number of injury hospitalizations has increased by 17 percent every year from 2002 through 2005

Demographics

- In 2005, males made up approximately 64% of all injuries requiring 48 hours or more of hospitalizations among COTS regional hospitals
- On average, the number of male injury hospitalizations have increased 17.5%, while females increased 16.5%, every year from 2002 through 2005
- In 2005, the age groups with the greatest number and percentage of injury hospitalizations include the 25-44 (26.1% of total) and 45-64 (20.7% of total) year old groups
- In 2005 males aged 25-64 years old made up approximately 33% of the total injury hospitalizations

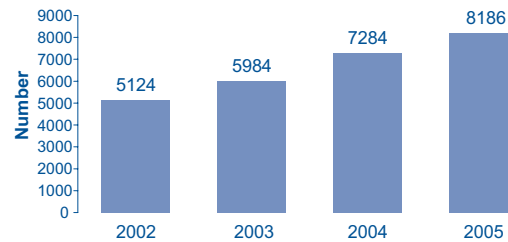


Figure 4.1: 2002-05 Number of Injury Hospitalization by Year, *COTS Region, OH*

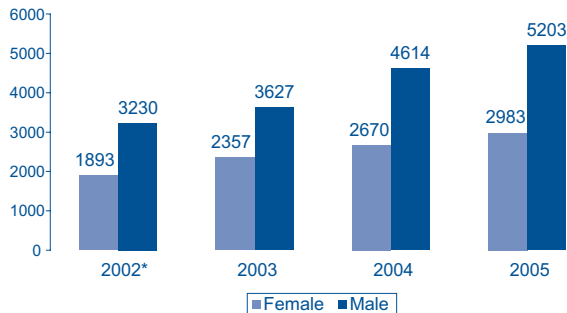


Figure 4.2: 2002-05 Number of Injury Hospitalization by Gender and Year, *COTS Region, OH*

*Note: Aggregating numbers by gender does not add up to total. In 2002, one case was not assigned a gender due to missing information

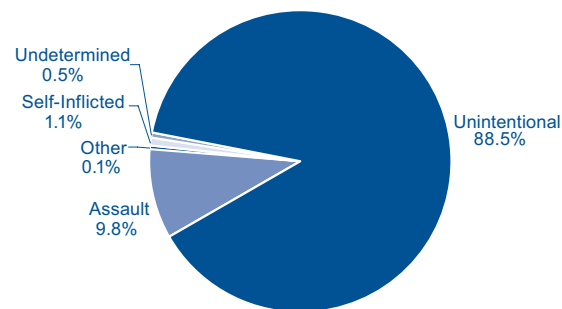


Figure 4.3: 2005 Percentage of Injury Hospitalizations by Intentionality, *COTS Region, OH*

In Franklin County assault cases account for 15% of all 48-hour hospitalizations (491/3212). Regionally, outside Franklin County, assault cases are only 6% of all 48-hour admissions (311/4974).

Geography

- From 2002-2005, the 5 residence zip code geographic areas in the region with the greatest number of injury hospitalizations include 43130, 43207, 43224, 43229, and 43302

Intentionality

- As in previous years, in 2005, unintentional injuries made up a vast proportion of injury hospitalizations (88.5%), followed by Assaults (9.8%)
- On average, the percentage of injury hospitalizations due to unintentional causes has decreased 0.2% a year, every year, from 2002 through 2005, while assault-related hospitalizations has increased approximately 3.5% a year every year

Mechanisms

- The top three mechanisms of all non-fatal injury hospitalizations among COTS member hospitals in 2005 are *Falls, Motor Vehicle Traffic Crashes, and Struck-by or Against an Object or Person*, which accounted for 73% (6,002 of 8,186) of the total number of injuries requiring two or more days of hospitalization
- On average, the number of *Fall*-related injury hospitalizations has increased 17.3% a year, every year from 2002 through 2005
- On average, the number of *Motor Vehicle Traffic Crash*-related injury hospitalizations has increased 16.2% per year, every year from 2002 through 2005



Section 4: 2005 COTS Regional Injury Hospitalizations & Trends

- On average, the number of *Struck-by or Against an Object or Person* injury hospitalizations has increased 2.2% per year, every year from 2002 through 2005

Figure 4.4: 2002-05 Total Number of Injury Hospitalization to COTS Member Hospitals by Zip Code of Residence, OH

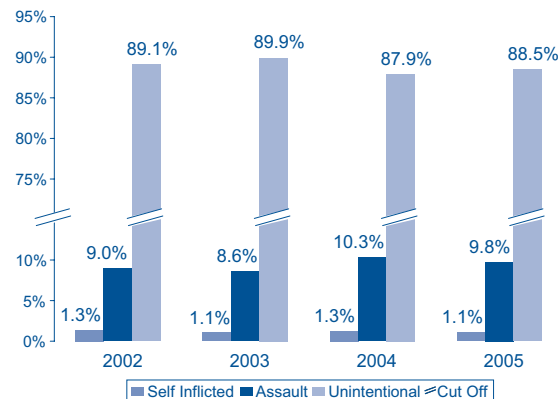
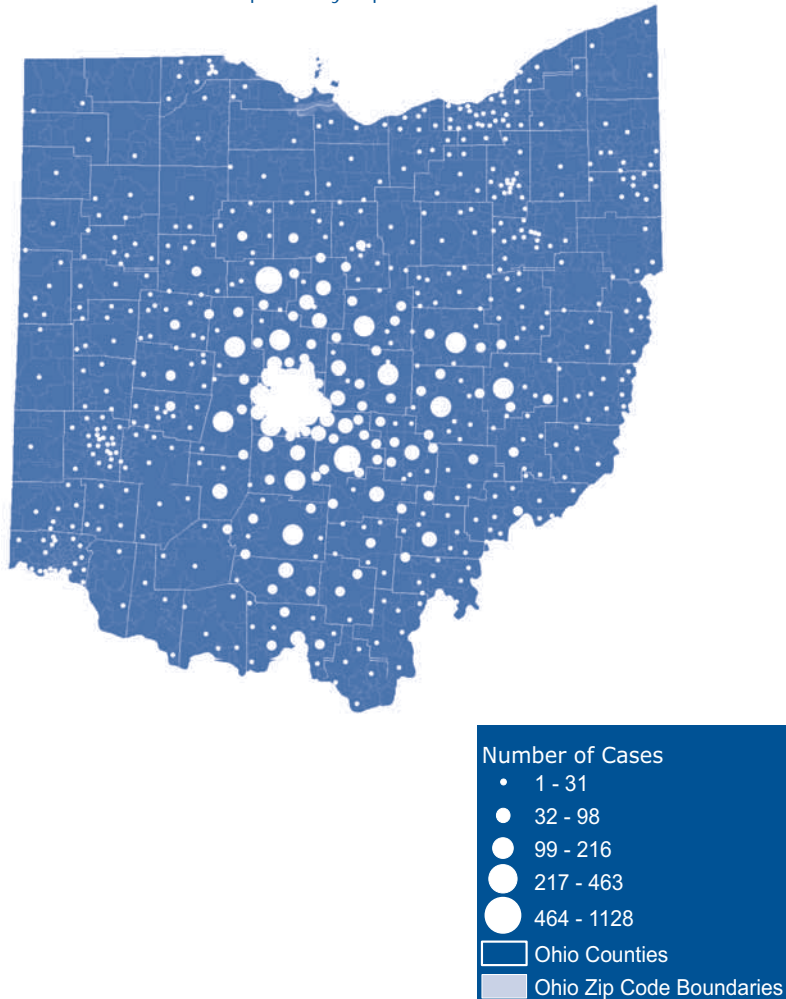


Figure 4.5: 2002-05 Percentage of Injury Hospitalizations by Intentionality* and Year, COTS Region, OH

*Excludes Undetermined and Other Intent

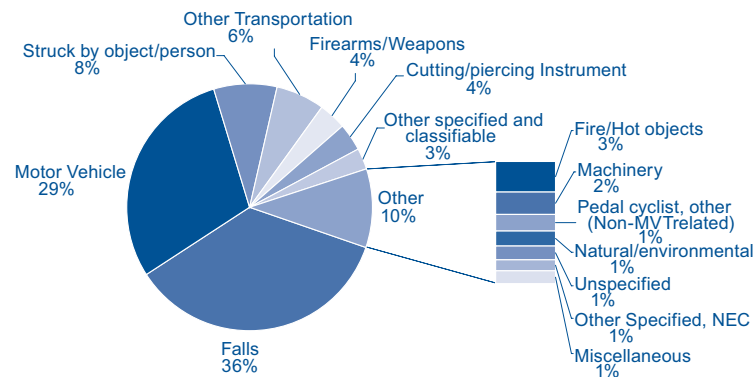


Figure 4.6: 2005 Percentage of Injury Hospitalizations by Mechanism, COTS Region, OH



Section 4: 2005 COTS Regional Injury Hospitalizations & Trends

Table 4.1: 2002-2005 Injury Hospitalization Numbers and Rate per 100,000 population, by Mechanism and Gender, *COTS Region, OH*

	2002				2003				2004				2005			
	Female		Male		Female		Male		Female		Male		Female		Male	
	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%
Fall	921	48.7%	886	27.5%	1135	48.2%	1012	27.9%	1306	48.9%	1231	26.7%	1466	49.1%	1454	27.9%
Motor vehicle traffic (MVT)	583	30.8%	958	29.7%	793	33.6%	1060	29.2%	827	31%	1419	30.8%	920	30.8%	1486	28.6%
Struck by, against	55	2.9%	319	9.9%	83	3.5%	342	9.4%	101	3.8%	474	10.3%	102	3.4%	574	11%
Transport, other	72	3.8%	185	5.7%	90	3.8%	204	5.6%	99	3.7%	290	6.3%	137	4.6%	393	7.6%
Cut/pierce	23	1.2%	173	5.4%	34	1.4%	179	4.9%	50	1.9%	203	4.4%	42	1.4%	246	4.7%
Firearm	23	1.2%	143	4.4%	19	0.8%	202	5.6%	26	1%	215	4.7%	36	1.2%	265	5.1%
Fire/hot object	49	2.6%	110	3.4%	57	2.4%	154	4.2%	76	2.8%	178	3.9%	59	2.0%	152	2.9%
Other specified and classified	32	1.7%	97	3%	41	1.7%	111	3.1%	39	1.5%	10	3.7%	55	1.8%	167	3.2%
Machinery	14	0.7%	86	2.7%	6	0.3%	113	3.1%	18	0.7%	130	2.8%	14	0.5%	141	2.7%
Unspecified	29	1.5%	81	2.5%	14	0.6%	52	1.4%	19	0.7%	95	2.1%	19	0.6%	79	1.5%
Pedal cyclist, other (Non-MVT related)	19	1.0%	55	1.7%	23	1.0%	70	1.9%	23	0.9%	77	1.7%	38	1.3%	77	1.5%
Natural/environmental	36	1.9%	41	1.3%	30	1.3%	40	1.1%	38	1.4%	46	1.0%	45	1.5%	56	1.1%
Other specified, not elsewhere classifiable	7	0.4%	26	0.8%	9	0.4%	40	1.1%	15	0.6%	41	0.9%	19	0.6%	54	1.0%
Overexertion	20	1.1%	22	0.7%	12	0.5%	14	0.4%	15	0.6%	13	0.3%	18	0.6%	15	0.3%
Pedestrian, other (Non-MVT related)	2	0.1%	10	0.3%	3	0.1%	12	0.3%	10	0.4%	11	0.2%	3	0.1%	19	0.4%
Drowning/submersion	2	0.1%	10	0.3%	4	0.2%	11	0.3%	3	0.1%	7	0.2%	6	0.2%	13	0.2%
Suffocation	1	0.1%	6	0.2%	3	0.1%	10	0.3%	2	0.1%	11	0.2%	4	0.1%	10	0.2%
Poisoning	2	0.1%	1	0.03%	1	0.04%	-	-	3	0.1%	3	0.1%	-	-	2	0.04%
Adverse effects	2	0.1%	6	0.2%	-	-	-	-	-	-	-	-	-	-	-	-
Total	1893*		3230		2357		3627*		2670		4614		2983		5203	

*NOTE: In 2002, aggregating gender specific numbers do not add up to total. A total of 16 cases could not be assigned a specific mechanism of injury (One female is missing an E-code 4th digit and could not be assigned to a specific mechanism; Two males were given an E-code of E849 place of injury code instead of a mechanism code; Twelve males are missing an E-code 4th digit and could not be assigned to a specific mechanism; and One male was not assigned an E-code at all). Additionally, one case was given a code of "unknown" for gender. In 2003, aggregating gender specific numbers do not add up to total. One male case is missing an E-code 4th digit and could not be assigned a specific mechanism."



Section 4: 2005 COTS Regional Injury Hospitalizations & Trends

Table 4.2: 2002-2005 Injury Hospitalization Numbers and Rate per 100,000 population, by Mechanism, *COTS Region, OH*

	2002		2003		2004		2005	
	Num.	%	Num.	%	Num.	%	Num.	%
Fall	1808	35.3%	2147	35.7%	2537	34.8%	2920	35.7%
Motor vehicle traffic (MVT)	1541	30.1%	1853	31%	2246	30.8%	2406	29.4%
Struck by, against	374	7.3%	425	7.1%	575	7.9%	676	8.3%
Transport, other	257	5%	294	4.9%	389	5.3%	530	6.5%
Firearm	166	3.2%	221	3.7%	241	3.3%	301	3.7%
Cut/Pierce	196	3.8%	213	3.6%	253	3.5%	288	3.5%
Other specified and classified	129	2.5%	152	2.5%	209	2.9%	222	2.7%
Fire/hot object	159	3.1%	211	3.5%	254	3.5%	288	3.5%
Machinery	100	2%	119	2%	148	2%	155	1.9%
Pedal cyclist, other (Non-MVT related)	74	1.4%	93	1.6%	100	1.4%	115	1.4%
Natural/environmental	77	1.5%	70	1.2%	84	1.2%	101	1.2%
Unspecified	110	2.1%	66	1.1%	114	1.6%	98	1.2%
Other specified, not elsewhere classifiable	33	0.6%	49	0.8%	56	0.8%	73	0.9%
Overexertion	42	0.8%	26	0.4%	28	0.4%	33	0.4%
Pedestrian, other (Non-MVT related)	12	0.2%	15	0.3%	21	0.3%	22	0.3%
Drowning/submersion	12	0.2%	15	0.3%	10	0.1%	19	0.2%
Suffocation	7	0.1%	13	0.2%	13	0.2%	14	0.2%
Poisoning	3	0.1%	1	0.002%	6	0.1%	2	0.02%
Adverse effects	8	0.2%	-	-	-	-	-	-
Total	5124*		5984*		7284		8186	

*NOTE: Aggregating numbers and percentages by mechanism does not add up to total or 100%. In 2002, thirteen cases were missing the 4th digit in the E-code, therefore, we were unable to assign the exact mechanism of injury; also one case was missing an E-code altogether and 2 cases were given a code of E849-place of injury code. In 2003, one case in is missing the 4th digit in the E-code, therefore, we were unable to assign the exact mechanism of injury.



Section 4: 2005 COTS Regional Injury Hospitalizations & Trends

Table 4.3: 2005 Injury Hospitalization Numbers and Percentages, by Mechanism and Intent, *COTS Region, OH*

	Unintentional		Assault		Self-inflicted		Undetermined		Other		Total	
	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%	Num.	%
Fall	2909	40.2%	2	0.3%	3.4	3.4%	6	13.3%	-	-	2920	35.7%
Motor vehicle traffic (MVT)	2405	33.2%	1	0.1%	-	-	-	-	-	-	2406	29.4%
Occupant	1861	25.7%	-	-	-	-	-	-	-	-	1861	22.7%
Motorcyclist	316	4.4%	-	-	-	-	-	-	-	-	316	3.9%
Pedal Cyclist	36	0.5%	-	-	-	-	-	-	-	-	36	0.4%
Pedestrian	151	2.1%	-	-	-	-	-	-	-	-	151	1.8%
Unspecified	33	0.5%	-	-	-	-	-	-	-	-	33	0.4%
Other	8	0.1%	1	0.1%	-	-	-	-	-	-	9	0.1%
Struck by, against	316	4.4%	357	44.6%	-	-	-	-	3	37.5%	676	8.3%
Firearm	43	0.6%	201	25.1%	32	36.0%	22	48.9%	3	37.5%	301	3.7%
Cut/pierce	152	2.1%	95	11.9%	35	39.3%	5	11.1%	1	12.5%	288	3.5%
Transport, other	530	7.3%	-	-	-	-	-	-	-	-	530	6.5%
Fire/hot object	208	2.9%	2	0.3%	-	-	1	2.2%	-	-	211	2.6%
Hot Object	101	1.4%	2	0.3%	-	-	-	-	-	-	103	1.3%
Fire	107	1.5%	-	-	-	-	1	2.2%	-	-	108	1.3%
Other specified and classifiable	152	2.1%	65	8.1%	2	2.2%	2	4.4%	1	12.5%	222	2.7%
Unspecified	41	0.6%	53	6.6%	1	1.1%	3	6.7%	-	-	98	1.2%
Pedal cyclist, other (Non-MVT related)	115	1.6%	-	-	-	-	-	-	-	-	115	1.4%
Other specified, not elsewhere classifiable	41	0.6%	23	2.9%	5	5.6%	4	8.9%	-	-	73	0.9%
Machinery	155	2.1%	-	-	-	-	-	-	-	-	155	1.9%
Natural/environmental	100	1.4%	-	-	-	-	1	2.2%	-	-	101	1.2%
Bite/sting	68	0.9%	-	-	-	-	-	-	-	-	68	0.8%
Pedestrian, other (Non-MVT related)	22	0.3%	-	-	-	-	-	-	-	-	22	0.3%
Suffocation	3	0.04%	1	0.1%	9	10.1%	1	2.2%	-	-	14	0.2%
Drowning/submersion	19	0.3%	-	-	-	-	-	-	-	-	19	0.2%
Overexertion	33	0.5%	-	-	-	-	-	-	-	-	33	0.02%
Poisoning	-	-	-	-	2	2.2%	-	-	-	-	2	0.02%
Adverse effects	-	-	-	-	-	-	-	-	-	-	-	-
Total	7244		800		89		45		8		8186	



SECTION V:
2003 INJURY MORTALITY & TRENDS
FRANKLIN COUNTY



Section 5: 2003 Injury Mortality & Trends Franklin County

Introduction

- In 2003, unintentional injuries rank as the 5th leading cause of death, while homicide is ranked 11th and suicide is ranked 14th
- In terms of years of productive life lost, unintentional injuries rank 3rd, while homicide and suicide rank 5th and 7th respectively
- Taken together, unintentional injury, homicide, and suicide deaths are responsible for a total of 11,367 years of productive life lost, making injury-related deaths the number one cause of years of productive life lost in Franklin County
- In 2003, there were 491 total injuries serious enough to cause death (a rate of 44.7 per 100,000 population)
- On average, the number and rate of injury related death have both shown a slight increasing trend of about 7% a year, every year, between 2000 and 2003

Demographics

- In 2003, males made up approximately 67% of all injury related deaths in Franklin County
- On average, the number and rate of male injury-related deaths have increased 8.7% and 9.8% respectively every year from 2000 through 2003, while females numbers and rates have increased 4.0% and slightly under 1.0% respectively
- In 2003, the age groups with the greatest number and percentage of injury deaths include the 25-44 year age group (34.2% of total), while the highest rate is seen in the 75+ year age group (185.0 per 100,000 population)
- In 2003 males aged 15-44 years old made up approximately 42% of the total injury deaths
- From 2001-2003, male injury deaths outnumber female injury deaths 2:1

Table 5.1: Top 20 Franklin County Leading Causes of Death (Total Number of Deaths = 8339), 2003

Rank	Cause of Death	Number
1	Diseases of the heart	2017
2	Malignant Neoplasm	1940
3	Cerebrovascular Disease	530
4	Chronic lower respiratory disease	242
5	Unintentional Injuries	285
6	Diabetes mellitus	278
7	Alzheimers Disease	213
8	Influenza and Pneumonia	184
9	Nephritis, nephritic syndrome and nephrosis	158
10	Septicemia	126
11	Homicide	109
12	Chronic liver disease and cirrhosis	92
13	Essential primary hypertension and hypertensive renal disease	90
14	Suicide	79
15	Certain conditions originating in the perinatal period	78
16	Parkinsons Disease	60
17	In situ_benign_unknown behavior neoplasm	50
18	Aortic aneurysm and dissection	48
19	Pneumonitis due to solids and liquids	46
20	HIV disease	45

Table 5.2: Top 10 Franklin County Leading Causes of Years of Productive Life Lost (YPLL), 2003

Rank	Cause of Death	Number
1	Malignant Neoplasm	7576
2	Diseases of the Heart	5775
3	Unintentional Injuries	5492
4	Certain conditions originating in the perinatal period	5070
5	Homicide	3892
6	Congenital malformations, deformations and chromosomal abnormalities	2303
7	Suicide	1983
8	Cerebrovascular Disease	918
9	Diabetes mellitus	897
10	HIV disease	856



Section 5: 2003 Injury Mortality & Trends Franklin County

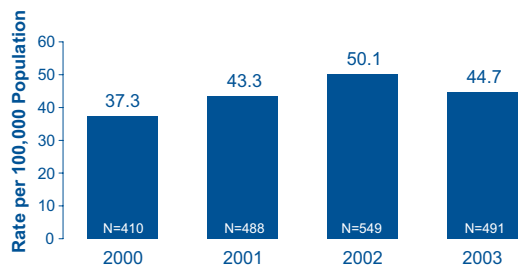


Figure 5.1: 2000-03 Rates of Injury Related Deaths per 100,000 Population by Year, Franklin County, OH

Table 5.3: 2003 Number and Rate of Injury Death by Gender and Age Group, Franklin County, OH

	Female		Male		Total	
	Number	Rate	Number	Rate	Number	Rate
00-04	5	12.3	8	19.3	13	15.8
05-14	5	6.7	6	7.7	11	7.3
15-24	15	20.1	72	93.5	87	57.4
25-44	36	20.3	132	73.6	168	47.1
45-64	31	24.5	63	55.2	94	39.0
65-74	11	35.4	14	57.7	25	45.1
75+	59	181.3	34	191.8	93	185.0
Total	162	27.0	329	61.8	491	44.7

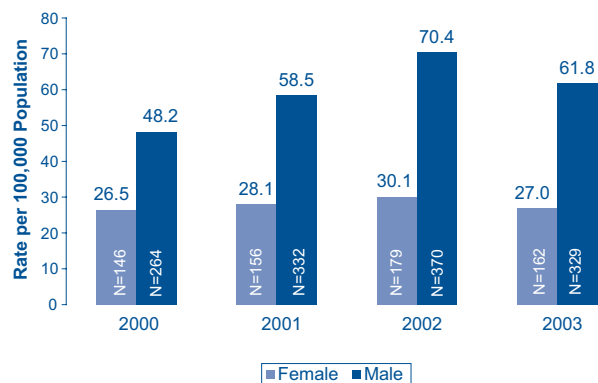


Figure 5.2: 2000-03 Rates of Injury Death per 100,000 Population by Gender and Year, Franklin County, OH

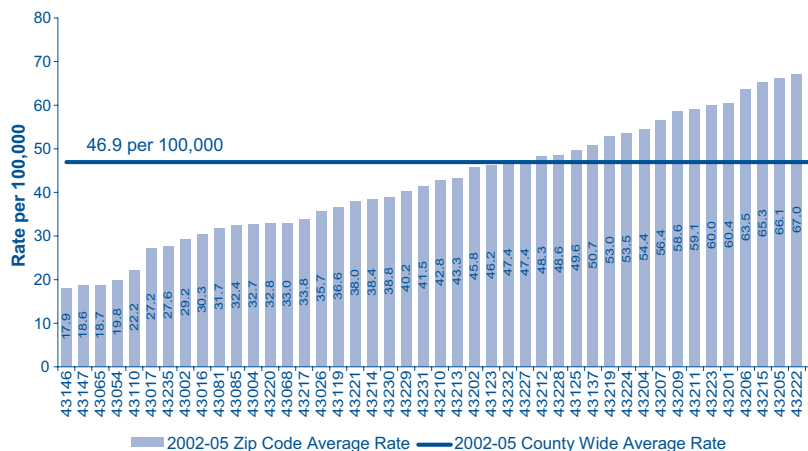


Figure 5.3: 2000-03 Average Rates of Injury Related Deaths per 100,000 Population by Zip Code of Residence, Franklin County, OH



Section 5: 2003 Injury Mortality & Trends Franklin County

Geography

- From 2000-2003, the top 5 residence zip code geographic areas with the highest average number of injury related deaths include 43219, 43223, 43209, 43207 and 43228
- From 2000-2003, the top 5 residence zip code geographic areas with the highest average rate of injury related deaths include 43203, 43222, 43205, 43215 and 43206

Intentionality

- In 2003, as in previous years, unintentional injuries made up a vast proportion of injury deaths (58%), followed by Homicides (22.2%)
- On average, the percentage of injury deaths due to unintentional causes has decreased approximately 1.5% a year, every year, from 2000 through 2003, while homicide related hospitalizations has increased approximately nearly 20% a year every year

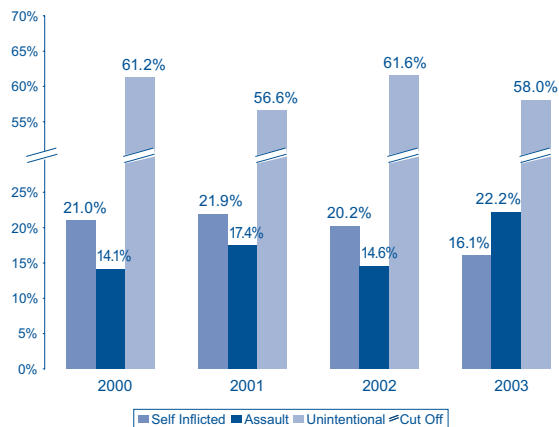


Figure 5.5: 2000-03 Percentage of Injury Related Deaths by Intentionality and Year, Franklin County, OH

Mechanisms

- The top three mechanisms of all injury deaths are *Firearms, Poisoning and Motor Vehicle Traffic Crashes*, which accounted for 56% (273 of 491) of the total number of injury related deaths among Franklin County residents in 2003
- The top three mechanisms of Unintentional injury deaths are *Motor Vehicle Traffic Crashes, Poisonings and Falls* which accounted for 61% (173 of 285) of the total number of Unintentional injury deaths among Franklin County residents in 2003
- The top two mechanisms of Homicide deaths are *Firearms and Cutting and Piercing*, which accounted for 83% (90 of 109) of the total number of Homicide deaths among Franklin County residents in 2003
- The top three mechanisms of Suicide deaths are *Firearms, Poisonings and Suffocation* which accounted for 89% (70 of 79) of the total number of Suicide deaths among Franklin County residents in 2003

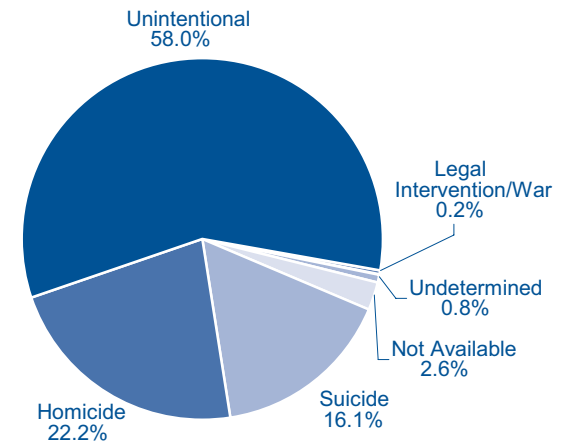


Figure 5.4: 2003 Percentage of Injury Related Deaths by Intentionality, Franklin County, OH

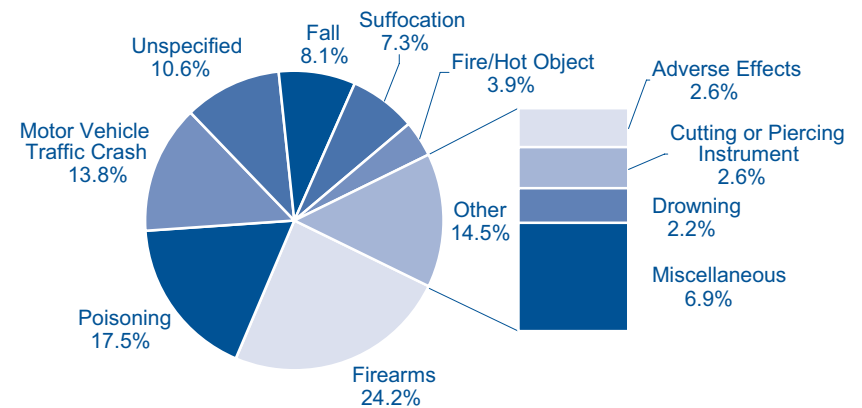


Figure 5.6: 2003 Percentage of Injury Related Deaths by Mechanism, Franklin County, OH



Section 5: 2003 Injury Mortality & Trends Franklin County

Table 5.4: 2000-2003 Injury Related Mortality Numbers and Rate per 100,000 Population, by Mechanism and Gender, *Franklin County, OH*

Mechanism of Injury Death	2000				2001				2002				2003			
	Female		Male		Female		Male		Female		Male		Female		Male	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Firearm	16	2.7	70	12.1	15	2.5	104	17.7	17	3.2	96	16.0	10	2.1	109	20.1
Poisoning	23	5.0	42	7.0	23	3.8	50	8.4	39	6.7	71	12.0	33	6.0	53	8.9
Motor Vehicle Traffic	21	4.1	49	8.6	28	4.7	68	12.7	40	7.5	80	16.0	19	3.1	49	9.1
Unspecified	24	2.3	6	1.0	32	5.7	22	3.8	34	3.2	20	3.0	40	4.5	12	1.7
Fall	13	1.4	11	1.8	10	1.2	18	3.0	13	1.3	23	3.5	16	2.4	24	3.6
Suffocation	15	1.8	29	6.4	23	4.2	32	5.8	11	2.9	37	7.8	12	1.6	24	4.0
Fire/Hot Object	9	4.9	9	2.5	7	1.8	7	1.8	4	1.2	8	1.7	8	2.1	11	4.2
Cut/Pierce	6	1.0	5	0.9	5	0.8	8	1.3	4	0.7	7	1.2	5	0.8	8	1.4
Other specified, not elsewhere classifiable	3	0.5	7	1.1	1	0.1	4	0.6	5	0.8	6	1.6	6	0.8	8	1.4
Drowning	2	0.6	5	1.7	3	1.8	5	1.2	1	0.5	7	2.0	4	2.0	7	2.5
Other Land Transport	6	1.0	11	1.8	-	-	3	0.5	-	-	-	-	-	-	11	1.9
Natural/Environmental	1	0.2	4	0.7	2	0.6	2	0.3					1	0.2	3	0.5
Pedestrian, other (Non-MVT related)	2	0.3	5	0.8	-	-	1	0.1	1	0.2	1	0.8	-	-	2	0.3
Other Transport			2	0.4							1	0.8			1	0.4
Struck by, against	-	-	2	0.3	-	-	1	0.2	-	-	-	-	-	-	1	0.2
Machinery			1	0.2			1	0.1								
Pedal cyclist, other (Non-MVT related)	-	-	-	-	-	-	1	0.5	-	-	1	0.2	-	-	-	-
Adverse Effects	4	0.5	5	0.8	7	0.9	2	0.3	7	0.8	6	1.0	8	1.4	5	0.8
Total	146	26.5	264	48.2	156	28.1	332	58.5	179	30.1	370	70.4	162	27.0	329	61.8



Section 5: 2003 Injury Mortality & Trends Franklin County

Table 5.5: 2000-2003 Injury Related Mortality Numbers and Rate per 100,000 Population, by Mechanism and Year, *Franklin County, OH*

Mechanism of Injury Death	2000		2001		2002		2003	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Firearm	86	7.3	119	10.0	113	9.5	119	11.1
Poisoning	65	6.0	7.3	6.1	110	9.3	86	7.5
Motor Vehicle Traffic	70	6.3	96	8.7	120	11.8	68	6.1
Unspecified	30	1.8	54	4.8	54	3.2	52	3.3
Fall	24	1.6	28	2.1	36	2.4	40	3.0
Suffocation	44	4.1	55	5.0	48	5.3	36	2.8
Fire/Hot Object	18	3.7	14	1.7	12	1.4	19	3.2
Cut/Pierce	11	0.9	13	1.1	11	0.9	13	1.1
Other specified, not elsewhere classifiable	10	0.8	5	0.4	11	1.2	12	0.9
Drowning	7	1.2	8	1.5	8	1.2	11	2.2
Other Land Transport	17	1.4	3	0.3	-	-	11	1.0
Natural/Environmental	5	0.4	4	0.4			4	0.3
Other specified and classifiable	1	0.1	3	0.2	6	1.8	3	0.6
Pedestrian, other (Non-MVT related)	7	0.6	1	0.1	2	0.5	2	0.2
Other Transport	2	0.2	-	-	1	0.4	1	0.2
Struck by, against Machinery	2	0.2	1	0.1			1	0.1
Pedal cyclist, other (Non-MVT related)	1	0.1	1	0.1				
Pedal cyclist, other (Non-MVT related)	-	-	1	0.2	1	0.2	-	-
Adverse Effects	9	0.6	9	0.6	13	0.9	13	1.1
Total	410	37.3	488	43.3	549	50.1	491	44.7

Table 5.6: 2003 Injury Related Mortality Numbers and Rate per 100,000 Population, by Mechanism and Intent, *Franklin County, OH*

	Unintentional		Homicide		Suicide		Underdetermined		Other		Total	
	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate	Num.	Rate
Firearm	3	0.3	78	6.8	37	3.4	-	-	1	0.1	119	10.5
Poisoning	66	5.9	-	-	18	1.7	2	0.2	-	-	86	7.8
Motor Vehicle Traffic	68	6.1	-	-	-	-	-	-	-	-	68	6.1
Occupant	10	0.9	-	-	-	-	-	-	-	-	10	0.9
Motorcyclist	6	0.5	-	-	-	-	-	-	-	-	6	0.5
Pedal Cyclist	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrian	10	0.9	-	-	-	-	-	-	-	-	10	0.9
Unspecified	42	3.8	-	-	-	-	-	-	-	-	42	3.8
Unspecified	48	5.6	2	0.2	-	-	2	0.2	-	-	52	6.1
Fall	39	4.3	-	-	1	0.1	-	-	-	-	40	4.4
Suffocation	18	2.1	3	0.3	15	1.3	-	-	-	-	36	3.7
Fire/Hot Object	11	1.1	4	0.4	4	0.4	-	-	-	-	19	1.8
Fire/Flame	11	1.1	4	0.4	4	0.4	-	-	-	-	19	1.8
Cut/Pierce	-	-	12	1.0	1	0.1	-	-	-	-	13	1.1
Other Specified, not elsewhere classified	4	0.4	8	0.7	-	-	-	-	-	-	12	1.2
Other Land Transport	11	1.0	-	-	-	-	-	-	-	-	11	1.0
Drowning	9	0.8	-	-	2	0.2	-	-	-	-	11	0.9
Natural/Environmental	4	0.4	-	-	-	-	-	-	-	-	4	0.4
Other Specified and classifiable	1	0.1	1	0.1	1	0.1	-	-	-	-	3	0.3
Pedestrian, other (NON-MVT related)	2	0.2	-	-	-	-	-	-	-	-	2	0.2
Other Transport	1	0.1	-	-	-	-	-	-	-	-	1	0.1
Struck by, against	-	-	1	0.1	-	-	-	-	-	-	1	0.1
Adverse Effects	-	-	-	-	-	-	-	-	13	1.4	13	1.4
Total	285	28.4	109	9.5	79	7.2	4	0.4	14	1.5	491	44.7



A microscopic image of plant tissue, showing various cellular structures and fibers. The image is in grayscale and serves as a background for the page. The text 'APPENDICES' is overlaid on the image.

APPENDICES

A

Appendices: Technical Notes

Glossary

Age-Adjusted Rate

A special kind of rate in which age-specific rates for a selected population are applied to a standard population to calculate what rate would be expected if the selected population had the same age distribution as the standard population. Note: Age-adjusted rates are artificial measurements and should never be compared to any other type of rate or be used to calculate the actual number of events (age-adjusted rates are further discussed in the Technical Notes section).

Age-Specific Rate

A statistical measure describing the number of events, which occur in a specified number of people in a specific age group within a defined time period, and allows the evaluation of an injury problem across different age groupings (age-specific rates are further discussed in the Technical Notes section).

E Code

The external cause of injury is defined by the World Health Organization's International Classification of Disease, 9th Revision Clinical Modification (ICD-9-CM). In this publication, the E Code describes the environmental events, circumstances, and conditions as to the cause of injury or poisoning. Prior to 1999, E codes as defined by ICD-9 were also used for injury deaths. Starting with 1999 mortality data, injury deaths are coded according to ICD-10.

Injury

Damage to the body from exposure to thermal, mechanical, electrical, or chemical energy or from the absence of essentials such as heat or oxygen. Injury causes are classified by mechanism and intent.

Injury Frequency

Number of times an event or characteristic occurs in a given time.

Intent

Intent of Injury: The purpose and awareness of the risk of injury. There are two major categories of injury intentionality, "unintentional" and "intentional". Two smaller categories of intent include "legal intervention" and "undetermined".

Intentional Injuries

Deliberate injury, categorized as:

Assault/alleged abuse: inflicted by one person on another. Considered homicide when the outcome is death.

Self-inflicted: purposefully inflicted by a person on his/herself. Considered suicide when the outcome is death.

Unintentional Injuries

Occurs without purposeful intent.

Undetermined

Intent is not known or could not be identified

Legal Intervention

Occurs during legal intervention

Mechanism (or Cause)

Mechanism describes the cause of the injury. Explained as the agent, instrument, or activity involved in the incident, such as fall or poisoning. See Appendix for mechanism definitions.

Some terms used to describe mechanism/causes of injury:

Cut/Pierce

Death/injury caused by cutting or piercing instruments or objects.

Drown

Death/injury caused by a lack of oxygen resulting from insufficient air and ingestion of water.

Natural/Environmental

Death/injury due to excessive heat or cold, lightning, natural disasters, and other environmental factors.

Falls

Death/injury resulting from falling, tripping, stumbling, pushing, colliding, or diving from different levels or the same level.

Firearms

Death/injury resulting from discharge of a handgun, rifle, shotgun, larger firearm, or other and unspecified firearm.

Fire/Hot

Death/injury resulting from asphyxia or poisoning from conflagration or ignition, burning by fire, hot substances or objects, caustic/corrosive materials, and steam.



Appendices: Technical Notes

Mechanism cont.

Motor Vehicle Traffic

Death/injury resulting from motor vehicle crash occurring on a public street or roadway.

Suffocation

Death/injury resulting from inhalation and ingestion of objects causing obstruction of the respiratory tract (mechanical suffocation), hanging, or strangulation.

Struck By/Against

Death/Injury resulting from being hit by blunt object or person.

Miscellaneous

A category for injury mechanism classification that represents a combination of several groupings for simplicity in reporting. In the injury matrix “other” is used to describe specific causes of injury and cannot be used as a general category.

Rate

Statistical measure that allows comparisons between different populations, such as geographical area or age group. An injury rate is calculated by dividing the number of people injured in a given time by the size of the population from which they are drawn. The number is then multiplied by 100,000 to obtain a standard rate. There are three main types of rates used in this document, crude, age-specific, age-adjusted which are further described in the Technical Notes section.

Years of Potential Life Lost (YPLL)

A measure of the impact of premature mortality on a population. It is calculated as the sum of the differences between some predetermined end point and the ages of death for those who died before that end point. The two most commonly used end points are age 65 years and average life expectancy. Because of the

way in which YPLL is calculated, this measure gives more weight to a death the earlier it occurs.

Technical Notes

Sources of Data

Mortality: Data relating to fatal injuries in Franklin County are from the State of Ohio Vital Statistics records. This report presents death certificate data from 2000 through 2003.

Non-fatal Injuries (Injury Hospitalizations): The data relating to non-fatal injuries, from 2002 through 2005 is from the Central Ohio Trauma System and its member hospitals.

Motor Vehicle Related Traumatic Brain Injuries (TBI): This data are a subset of non-fatal injury hospitalizations. The patients included in this subset have one or more of the following ICD-9 nature of injury codes: 800.0-800.9, 801.0-801.9, 803.0-804.9, 850.0-854.1, 950.1-950.3, 348.4-348.8, or 472.72 and one or more of the following ICD-9 E-codes: E810-819 (.0-.9), E958.5, E968.5, or E988.5 in addition to the above nature of injury codes.

Population:

1. 2002-2005 Franklin County, OH, COTS Hospitalization Rates: [2005 U.S. Census Bureau Population Estimate for Franklin County, OH.](#)
2. 2002-2005 average Franklin County, OH, Zip-Code Age-Adjusted COTS Hospitalization Rates: [2000 U.S. Census Bureau Zip Code Tabulation Area population estimates.](#)
3. 2000-2003 Franklin County, OH Mechanism of Injury Death Rates: [National Center for Health Statistics. Estimates of the July 1, 2000-July 1,](#)

[2003, United States resident population from the Vintage 2003 postcensal series by year, county, age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau.](#)

Limitations of Data

The COTS data on non-fatal injuries hospitalizations includes:

- Injured patients admitted to the hospital for 48 hours or greater
- Injured patients transferred in and out of hospitals for further evaluation
- Injured patients that died after arrival to a hospital regardless of their length of stay

COTS data does not include patients treated in the emergency room and released. The entire scope of non-fatal injury in Franklin County would require injury data from every hospital, urgent care center, clinic, physician, Emergency Medical System (EMS) run, etc. Due to the limited data available, the numbers and figures in this monograph are not reflective of the total burden of injury in Franklin County and are approximations.

Since it is most likely that the real numbers of injury are higher, the estimates provided in this monograph should be regarded as conservative and interpreted with caution.



Appendices: Technical Notes

Leading Causes Ranking

Leading causes of death, fatal injuries, and non-fatal injuries are ranked according to descending frequencies or percentages. For example, the cause with the largest count or percentage is ranked 1st, the next largest count or percentage is ranked 2nd, etc.

Rate Calculations

Different types of rates are presented in this report. They include crude, age-specific and age-adjusted.

Crude Rate

Crude rates are calculated by dividing the number of people who were injured during a given time period by the size of the population from which they were drawn. By convention, this number is then multiplied by 100,000 to show a whole number instead of a fraction. Rates based on the actual number of events in the total population during the given time period are known as crude rates. The formula for the crude rate is as follows:

$$CR = \frac{\sum X_i}{\sum Y_i} \times 100,000$$

where X is the number of hospitalizations or deaths and Y is the total population size from which the hospitalization or deaths are drawn.

Age-specific Rate

Age-specific Rates are calculated by dividing the appropriate aggregated number of trauma hospital admissions or injury deaths (the numerator) for the age grouping and dividing

by the population from that age grouping (the denominator). By convention, the computed number is multiplied by 100,000 to generate comparable rates. The general formula for the age-specific rates (ASR) used is as follows:

$$ASR = \frac{\sum X_i}{\sum Y_i} \times 100,000$$

where X is the number of hospitalizations or deaths and Y is the population size for the ith age group.

In addition, 95% Confidence Intervals (CI) for the age-specific rate were calculated using the approximation method formula based on the Poisson distribution:

Upper and Lower CI = $ASR \pm 2(SE)$

standard error (SE) = $\frac{ASR}{\sqrt{N}}$

where N is the number of hospitalizations or deaths.

Age-Adjusted Rates

The direct method of age-adjustment was used in this report and is achieved by multiplying each age-specific rate in the population of interest with the proportion of persons in the corresponding age group within a reference or standard population. The sum of these numbers is multiplied by 100,000 and represents the rate of injury death or injury hospitalization in the population of interest, if it had the same age structure as the standard population. Therefore, the influence of age,

when comparing two age-adjusted rates, is controlled. (Note: Age-adjusted and crude rates should never be compared to one another.) The rates were adjusted according to the U.S. 2000 estimated population distribution. The general formula for the age-adjusted rate is as follows:

If the rate in the ith age class of area a is

$$r_{ia} = \frac{X_{ia}}{n_{ia}}$$

then DSR_a equals:

$$DSR_a = \frac{\sum_i r_{ia} n_{is}}{\sum n_{is}}$$

DSR_a = directly standardized rate

for area a

n_{ia} = number of individuals in ith age class in area a

n_{is} = number of individuals in ith age class of standard area

x_{ia} = number of cases in ith age class of area a

Reliability

Rates, even when they are based on full population counts (as in this report), should be considered estimates and subject to error. The observed or crude hospitalization or death rate is an estimate of the true or underlying rate. Rates are subject to chance variation. The variation of the rate is directly related to the number of events used to calculate the rate. The smaller the number of events used to calculate the rate, the higher the variability of the rate. Rates based on unusually small numbers of events over a specified period of time or for a sparsely populated geographic area should be of particular concern and be



Appendices: Technical Notes

used cautiously. When few events or small populations are evident in calculating/studying rates, multiple-year summary rates or average annual rates will sometimes provide a much better perspective by strengthening or enlarging the numbers used to calculate the rate.

An observed rate's variability can be estimated by its standard error (SE), which can be used to calculate a confidence interval (CI) to determine the range of probable values for the true or underlying rate (See above).

Note: Due to instability arising from small numbers the National Center for Health Statistics considers rates based on 20 or fewer cases to be statistically unreliable and to be regarded with caution. Rates presented in this document calculated from small numbers should be interpreted cautiously.

Zip Code Average Age-Adjusted Rates

Small area rates, such as zip code based rates, are often produced by using few events or small numbers in the numerator or denominator, and thus are often unstable rates with large variability. Maps created using these small area rates are often prone to cartographic visualization errors, where the picture of the underlying data distribution is not accurate. One method to overcome the small area numbers problem and visualization error is to smooth or decrease the variability by using a spatial moving average. The simplest method of spatial moving average is used in this document, whereby the value for a single zip code is based on the summed value of that zip code and the contiguous neighboring zip codes.

This is based on the geographic principle that things closer together are more related than things further apart. Thus, for each and every zip code in Franklin County, the age-adjusted rate calculated and assigned to each zip code is based on the number of cases or deaths and population figures from its own and its immediate surrounding zip codes.

Recommended framework of E-code groupings for presenting injury mortality and morbidity data (August 16, 2004, National Center for Injury Prevention and Control, CDC)



Appendices: Technical Notes

Recommended framework of E-code groupings for presenting injury mortality and morbidity data (August 16, 2004, National Center for Injury Prevention and Control, CDC)

Manner/Intent	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Cut/pierce	E920.0-.9	E956	E966	E986	E974
Drowning/submersion	E830.0-.9, E832.0-.09, E910.0-.9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Fire/burn	E890.0-E899, E924.0-.9	E958.1,.2,.7	E961, E968.0,.3 E979.3	E988.1,.2,.7	
Fire/flame	<i>E890.0-E899, E924.0-.9</i>	<i>E958.1,.2,.7</i>	<i>E961, E968.0, E979.3</i>	<i>E988.1,.2,.7</i>	
Hot object/substance	<i>E890.0-E899</i>	<i>E958.1</i>	<i>E968.0, E979.3</i>	<i>E988.1</i>	
Firearm	E922.0-.9,.8,.9	E955.0-.4	E965.0-.4, E979.3	E985.0-.4	E970
Machinery	E919 (0-.9)				
Motor vehicle traffic ^{2,3}	E810-E819 (.0,.9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.9)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal Cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	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/Environmental	E900.0-E909; E928.0-.2	E958.3		E988.3	
Bites and stings ¹	<i>E905.0-.6,.9 E906.0-.4,.5,.9</i>				
Overexertion	E927				
Poisoning	E850.0-E869.9	E950.0-E925.9	E962.0-.9	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973,E975
Other specified and classifiable ⁴	E846-E848; E914-E915; E918; E921.0-.9; E922.4 , .5; E923.0-.9; E925.0-E926.9, E928.3 , E929.0-.5	E955.5, .6, .7, .9; E958.0,.4	E960.1; E965.5-.9; E967.0-.9; E968.4, .6, .7, E979.0-.2, E979.5-.9	E985.5, .6, .7; 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	E968.8; E969	E988.8; E989	E977; E995; E997.8; E998; E999
All injury	E800-E869; E880-E929	E950-E959	E960-E969, E979	E980-E989	E970-E978; E990-E999
Adverse effects					E870-E879; E930.0-E949.9
Medical care					E870-E879
Drugs					E930.0-E949.9
All external causes					E800-E999

¹Includes legal intervention (E970-E978) and operations of war (E990-E999).

²Three 4th digit codes (.4 [occupant of streetcar], .5 [rider of animal], .8 [other specified person]) are not presented separately because of small numbers. However, because they are included in the overall motor vehicle traffic category, the sum of these categories can be derived by subtraction.

³E968.5 (assault by transport vehicle), E906.5 (bite from unspecified animal), E922.4 (unintentional injury [gunshot wound] with BB/pellet), E955.6 (suicide attempt/intentionality self-inflicted injury [gunshot wound] with BB/pellet gun), E986.6 (assault [gunshot wound] with BB/pellet gun), and E985.6 (undetermined intent injury [gunshot wound] with BB/pellet gun) are specific to the ICD_9_CM and, therefore, only apply to morbidity coding.

⁴E849 (place of occurrence) has been excluded from the matrix. For mortality coding, an ICD_9 E849 code does not exist. For morbidity coding, an ICD_9_CM E849 code should never be first_listed E code and should only appear as an additional code to specify the place of occurrence of the injury incident.



Appendices: Technical Notes

Preliminary External Cause of Injury Mortality Matrix for ICD-10 (December 10, 2002, National Center for Injury Prevention and Control, CDC)

Mechanism/Cause	Manner/Intent				
	Unintentional	Suicide	Homicide	Undetermined	Other
Cut/pierce	W25-W29, W45	X78	X78	Y28	Y35.4
Drowning/submersion	W65-W74	X71	X92	Y21	
Fall	W00-W19	X80	Y01	Y30	
Fire/burn	X00-X19	X76-X77	X97-X98, *U01.3	Y26-Y27	Y36.3
Fire/flare	X00-X09	X76	X97	Y26	
Hot object/substance	X10-X19	X77	X98	Y27	
Firearm	W32-W34	X72-X74	X93-X95, *U01.4	Y26-Y27	Y36.3
Machinery	W24, W30-W31				
All Transport	V01-V99	X82	Y03, *U01.1	Y32	Y36.1
Motor vehicle traffic ^{2,3}					
Occupant	V30-V39 (.4-.9), V40-V49 (.4-.9), V50-V59 (.4-.9), V60-V69 (.4-.9), V70-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 (.0-.3), V30-V39 (.0-.3), V40-V49 (.0-.3), V50-V59 (.0-.3), V60-V69 (.0-.3), V70-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/Environmental	W42, W43, W53-W64, W92-W99, X20-X39, X51-X57				
Overexertion	X50				
Poisoning	X40-X49	X60-X69	X85-X90, *U01.6-.7	Y10-Y19	Y35.2
Struck by, against	W20-W22, W50-W52	X79	Y00, Y04	Y29	Y35.3
Suffocation	W75-W84	X70	X91	Y20	
Other specified and classifiable	W23, W35-W41, W44, W49, W85-W91, Y85	X75, X81, *U03.0	X96, Y02, Y05-Y07, *U01 (.0, .2, .5)	Y25, Y31	Y35 (.1, .5), Y36 (.0, .2, .4-.8)
Other specified, not elsewhere classifiable	X58, Y86	X83, Y87.0	Y08, Y87.1, *U01.8, *U02	Y33, Y87.2	Y35.6, Y89 (.0, .1)
Unspecified	X59	X84, *U03.9	Y09, *U01.9	Y34, Y89.9	Y35.7 Y36.9
All injury	V01-X59, Y85-Y86	X60-X84, Y87.0	X85-Y09, Y87.1	Y10-Y34, Y87.2, Y89.9	Y35-Y36, Y89 (.0,.1)
Adverse effects					Y40-Y59, Y60-Y84, Y88
Medical care					Y40-Y59, Y88.0
Drugs					Y60-Y84, Y88 (.1-.3)

Notes:

1) This framework was developed to be consistent with the framework developed based on ICD-9 external cause of injury codes as published in <http://www.cdc.gov/mmwr/PDF/rr/rr4614.pdf>

2) Drowning is the one external cause that has been redefined in this matrix. Codes for water transportation-related drowning, V90 and V92, are included in the transportation codes rather than with the drowning codes. In the ICD-9 version of the matrix, the comparable codes, E830 and E832, were included with drowning. This change was made to be consistent with other mechanisms involved with water transport-related injuries.

3) In this version, V81.1 and V81.1 were moved from the row for motor vehicle traffic- occupant to the row for motor vehicle traffic- other.

4) This version also contains the new ICD-10 codes for terrorism. The codes are bolded and are preceded with ***.



Appendices: Technical Notes

References

1. Healthy People 2010, Centers for Disease Control and Prevention.
2. Finkelstein E., Corso P., Miller T. The Incidence and Economic Burden of Injuries in the United States; 2006, Oxford University Press.
3. Ohio Department of Public Safety, OH-1 Fatality Reports for Franklin County, OH.
4. Kahane CJ. Fatality Reduction by Safety Belts for Front Seat Occupants of Cars and Light Trucks. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 2000. DOTHS 809 199.
5. National Highway Traffic Safety Administration. Fourth report to Congress: effectiveness of occupant protection systems and their use. Washington D.C.: US Department of Transportation, National Highway Traffic Safety Administration, 1999. DOTHS 808 919.
6. National Highway Traffic Safety Administration. Motorcycle Safety Program-Injury Mitigation: January 2003, www.nhtsa.gov.
7. National Research Council; Understanding and Preventing Violence, 1993, National Academy Press: page 61.





Central Ohio
Trauma System

431 East Broad Street
Columbus, OH 43215

www.goodhealthcolumbus.org