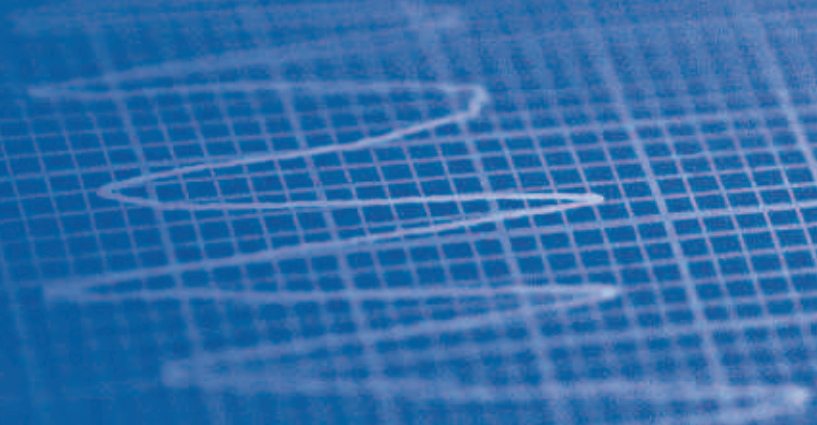


Central Ohio Trauma System 2004 Report:

Motor Vehicle Traffic Crash and Assault Injuries
in Central Ohio – A Public Health Assessment

04



Acknowledgements	ii
Epidemiology of Trauma	iii
Central Ohio Trauma System: Agency Background	iv
The COTS Board of Trustees	vi
Central Ohio Trauma System: Committee Members	vii
Message from the COTS President	viii
Introduction/Executive Summary	ix
A Message from Columbus Health Commissioner Dr. Teresa Long	x
Section 1: Franklin County Resident Motor Vehicle Traffic Crash Hospitalizations & Death	1
Franklin County COTS Data: Non-Fatal MVT Hospitalizations	2
Franklin County Mortality Data: MVT Related Deaths	9
Section 2: Summary of Franklin County Assault Injury Hospitalizations	13
Franklin County COTS Registry Data: Non-Fatal Assault Hospitalizations	14
Section 3: Summary of Regional Motor Vehicle Traffic Crash Hospitalizations	19
Regional COTS Registry Data: Non-Fatal MVT Hospitalizations	20
Section 4: Summary of Regional Assault Injury Hospitalizations	23
Regional COTS Registry Data: Non-Fatal Assault Hospitalizations	24
Section 5: Summary of All Mechanisms of Injury Hospitalizations	27
Regional COTS Registry Data: Non-Fatal Hospitalizations	28
Franklin County COTS Registry Data: Non-Fatal Hospitalizations	30
Section 6: Summary of Franklin County Resident All Mechanisms of Injury Mortality	31
Franklin County Injury Mortality Data: All Mechanisms Summary	32
Apendices	35



Acknowledgements

This report was prepared by the Columbus Health Department, Division of Planning and Preparedness, and the Central Ohio Trauma System (COTS). The Columbus Health Department and COTS acknowledge the committed staff of the central Ohio hospitals that contribute data to make the Regional Trauma Registry and this report realities.

This report is in the public domain and may be used and reprinted without special permission, however citation to source is appreciated. The suggested citation is:

Columbus Health Department and Central Ohio Trauma System. Central Ohio Trauma System 2004 Report: Motor Vehicle Traffic Crash and Assault Injuries in Central Ohio—A Public Health Assessment. October 2004, Columbus, Ohio.

The COTS Regional Trauma Registry is in its fifth year of operations. The COTS Registry contains blinded data on trauma victims provided by central Ohio hospitals. The following central Ohio hospitals contributed data for this 2003 report:

- Berger Health System, Circleville
- Children's Hospital, Columbus
- Coshocton County Memorial Hospital, Coshocton
- Doctors Hospital, Columbus
- Fairfield Medical Center, Lancaster
- Grady Memorial Hospital, Delaware
- Grant Medical Center, Columbus
- Knox Community Hospital, Mt. Vernon
- Madison County Hospital, London
- Memorial Hospital of Union County, Marysville
- Morrow County Hospital, Mt. Gilead
- Mount Carmel East, Columbus
- Mount Carmel St. Ann's, Westerville
- Mount Carmel West, Columbus
- The Ohio State University Hospital East, Columbus
- The Ohio State University Medical Center, Columbus
- Riverside Methodist Hospital, Columbus
- Southeastern Ohio Regional Medical Center, Cambridge

For additional information on the COTS Regional Registry or to request aggregate data, contact (614) 240-7419, extension 3. This report is made possible by funding through the Ohio Department of Public Safety Safe Communities Program and COTS. 2003 funding for COTS was provided by:

- Central Ohio Fire Chiefs' Association, Plain City
- Columbus Medical Association Foundation, Columbus

- Children's Hospital, Columbus
- Columbus Coalition Against Family Violence, Columbus
- Columbus Health Department, Columbus
- Franklin County Firefighters' Association, Inc., Columbus
- Franklin County Fire Chiefs' Association, Grove City
- Grant Medical Center, Columbus
- Mount Carmel Health System, Columbus
- The Nationwide Foundation, Columbus
- Ohio Department of Public Safety, Division of EMS, Columbus
- Ohio Department of Health, Environmental Health Bureau, Columbus
- Ohio Hospital Association, Columbus
- The Ohio State University Hospitals, Columbus
- Riverside Methodist Hospital, Columbus

COTS is also supported through private donations. The following individuals contributed to COTS in 2003:

- Sharon Brewer
- Donna A. Caniano, MD
- William L. Dean, MD & Dorothy E. Dean, MD
- Robert E. Falcone, MD
- Jonathan I. Groner, MD & Cathy J. Levine, JT
- Kathryn J. Haley
- Harlan D. Meyer, MD
- Michael Smeltzer

As a designated 501(c)(3) organization, contributions to COTS are tax-deductible. For more information on the COTS' Endowment Fund or to support COTS general operations, contact (614) 240-7420, extension 120. For a copy of the COTS 2003 Annual Audit, contact Nancie Bechtel at (614) 240-7419, extension 6.



Trauma is serious physical injury from violent energy that disrupts the body's tissues. Trauma is generally considered to include those injuries with the potential to cause death or permanent loss of physical functioning of a body part. The three classifications of trauma are blunt, penetrating, and thermal. Trauma is considered a disease because of recognizable signs and symptoms, as well as an epidemic because of these facts:

- The Centers for Disease Control report nearly 30 million injuries in the U.S. annually, with over 148,000 trauma deaths in 2001. **Trauma is the leading cause of death for persons 1 to 40 years of age¹.** Trauma results in a fatality **every six minutes** and serious disability **every two seconds**.
- Unintentional trauma (excludes intentional injuries associated with violence) accounts for 30% of all lost years of productive life before age 65, **exceeding the combined losses from heart disease, cancer, and stroke².** In Ohio, trauma is responsible for nearly 30,000 hospitalizations⁷ and 5,000 deaths³ annually. Approximately 45% of deaths due to trauma in Ohio can be **prevented⁴.** Autopsy and case studies in other communities indicate that as many as 73% of trauma deaths not involving the central nervous system could have been prevented⁵.
- Trauma is expensive. National figures denote **478 billion dollars are spent annually** on trauma-related events, equating to **\$4,900 per U.S. household⁶.** But the true financial cost to the community is far greater in that lost wages, property damage, long-term disability, and trauma-induced family instability are not currently measurable.
- Central Ohio hospitals admit over **6,200 trauma patients per year**, equal to **17 people per day** or **one person every 85 minutes**. Over **500** central Ohioans **die from trauma** each year⁸.
- Motor vehicle crashes are the **third leading cause** of significant years of life lost after heart disease and cancer⁹.
- The **cost of motor vehicle crashes** in the United States is over **\$50 billion**; in Franklin County the cost of motor vehicle fatalities alone is **\$100 million¹⁰.**
- America has the highest rate of **gun related homicide** in the developed world¹¹.
- People who live in homes with a handgun are nearly **three times as likely** to commit a domestic **homicide** and **five times as likely** to complete **suicide¹¹.**

1 National Center for Health Statistics, Centers for Disease Control & Prevention, 2001: <http://webapp.cdc.gov/>

2 Bonnie J. Fulco C, et al. Reducing the Burden of Injury: Advancing Prevention and Treatment, Committee on Injury Prevention and Control, Institute of Medicine, National Academy Press, 1999

3 Ohio Nurses Association Position Statement, Trauma System Legislation for the State of Ohio, 1998.

4 Zuspan SJ, Trauma Systems: Designing a System for Ohio, Lecture, Ohio Committee on Trauma, 1998.

5 West John G, Trunkey, Donald D., et al. Systems of Trauma Care: A Study of Two Counties, Arch Surg, Vol 114, Apr 1979, p 455-460

6 MVSR Births and Deaths, Centers for Disease Control & Prevention, 1995

7 The Register, Ohio Trauma Registry, Department of

Public Safety Division of EMS, Issue 5, December 2001

8 Central Ohio Trauma System Regional Registry, 2003

9 Christofell T, Gallagher S. Injury Prevention and Public Health; 1999, Aspen Publishers: page 73

10 National Highway Traffic Safety Administration, Motor Vehicle Safety Cost of Crashes Software, 2004

11 Gellart G. Confronting Violence; 2002, American Public Health Association: pages 264-65



Central Ohio Trauma System: Agency Background

The overall objectives of a regional trauma system such as COTS are to:

- Improve patient outcomes
- Enhance practice efficiency
- Save costs to patients, caregivers, institutions, and the community overall from healthcare

The Mission of COTS 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 is the forum for addressing issues affecting the delivery of trauma and emergency healthcare services primarily in central Ohio.

COTS goals include:

- The establishment of an inclusive system where community partners work together to resolve issues associated with trauma and emergency care;
- Maintenance of a COTS-facilitated process that achieves:
 - Central Ohio resources working together for a reduction in deaths and permanent disabilities from trauma;
 - Enhanced emergency care;
 - Improved collaboration among services;
 - Expanded public education with regards to trauma prevention;
 - Comprehensive preparedness by central Ohio hospitals' for large scale disasters; and
- To become the recognized leader addressing trauma-related issues in central Ohio.

The COTS target population remains the entire central Ohio community who requires the trauma and/or emergency services of healthcare professionals. COTS maintains an Internal Revenue status of 501(c)(3) and operates with charitable, educational, and scientific intent. COTS is a voluntary, cooperative, self-regulatory organization established with respect to national standards for regional trauma systems according to the American College of Surgeons Committee on Trauma.

The following staff supports the COTS regional work:

Julia A. Andrews, RN, SANE, LNC,
Domestic Violence Coordinator

Nancie M. Bechtel, BSN, RN, CEN, EMTB,
Executive Director

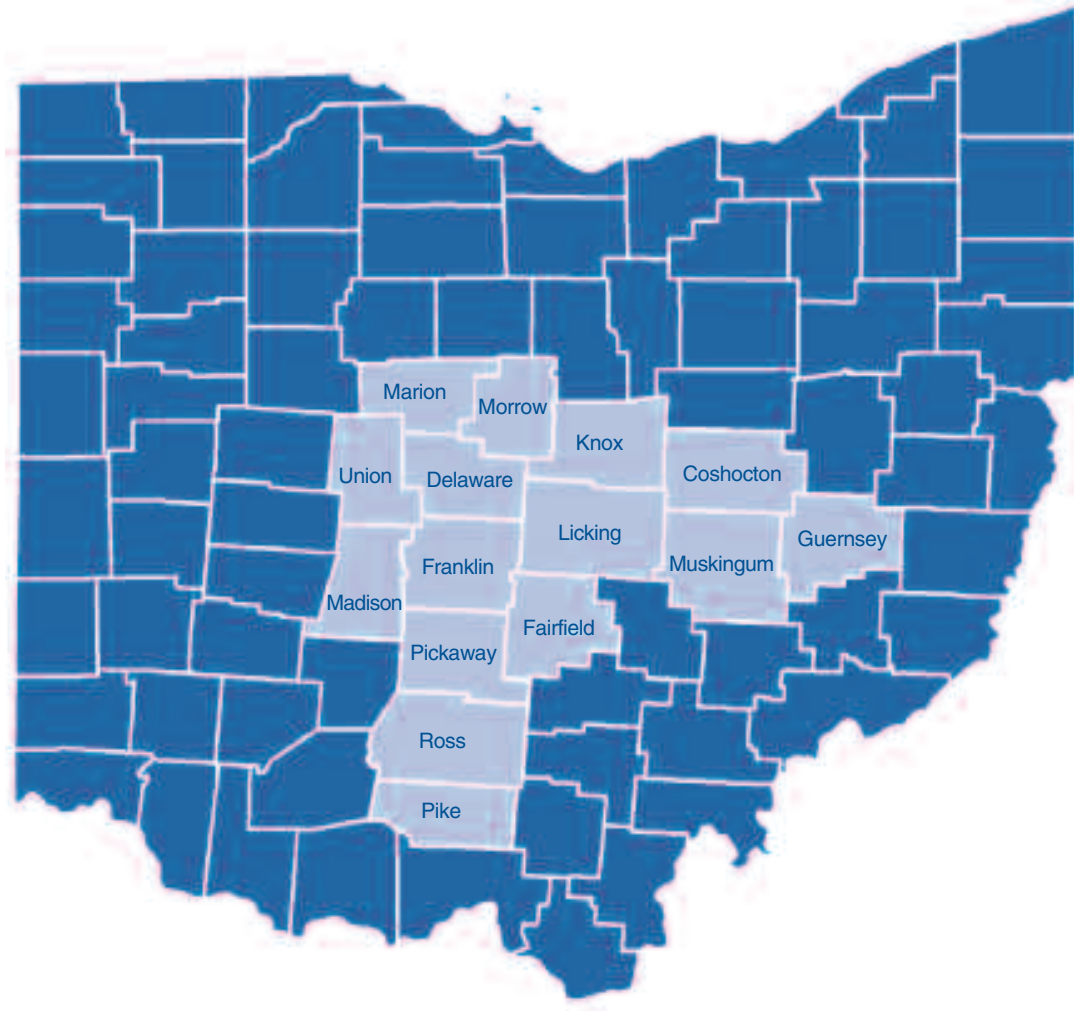
Philip H. Cass, PhD, *CEO Columbus Medical Association, Columbus Medical Association Foundation, Physicians Free Clinic, and COTS*

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

Christine M. Sheppard, BS, CPS,
Education Coordinator/Administrative Assistant

Jocelyn Zerkle-Kidd, RN,
Regional Hospital Emergency Preparedness Coordinator





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



The COTS Board of Trustees

The COTS Board of Trustees is comprised of health care experts in central Ohio from hospitals, emergency medical services (EMS), public health agencies and the Columbus Medical Association. The following individuals serve on the COTS Board of Trustees:

Jonathan I. Groner, MD, Trauma Medical Director, Children's Hospital, Columbus, Ohio; representing the Columbus Medical Association, *President*

Kathryn J. Haley, RN, BSN, CEN, Trauma Program Manager, Children's Hospital, Columbus, Ohio, *Vice-President*

Kirk A. Hummer, RN, MBA, Chief Operating Officer, Mount Carmel St. Ann's, Westerville, Ohio, *Secretary-Treasurer*

Robert E. Falcone, MD, FACS, President, Grant Medical Center, Columbus, Ohio, *Immediate Past-President*

Jennifer A. Bogner, PhD, Director of Research, Department of Physical Medicine and Rehabilitation, The Ohio State University Medical Center, Columbus, Ohio

Marco J. Bonta, MD, Medical Director, Trauma Services, Riverside Methodist Hospital, Columbus, Ohio

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

Carol J. Elliott, MSN, RN, CEN, Nurse Manager, Emergency Services, Mount Carmel East, Columbus, Ohio

Jan E. Elston, MD, Medical Director, Trauma Services, Genesis Health Care System, Zanesville, Ohio

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

Thomas J. Gavin, MD, FACEP, Associate Professor, Clinical Emergency Medicine, The Ohio State University Department of Emergency Medicine, Columbus, Ohio, representing The Ohio State University Hospital East

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

Henry K. Kauffman, Jr., AAS, EMTP, Fire Chief, City of Grandview Heights, Ohio; representing the Franklin County Fire Chiefs Association, Columbus, Ohio

David P. Keseg, MD, FACS, Medical Director, Columbus Division of Fire/EMS, Ohio and Chief Development Officer for Premier Health Care Services, Dayton, Ohio; representing the Columbus Medical Association

Lauren G. LaRosa, RN, BSN, Manager Emergency Services, Doctors Hospital, Columbus, Ohio

Bradley J. Lewis, MD, Franklin County Coroner, Ohio

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

Clifford Mason, EMTP, Fire Chief, Genoa Township Fire Department; President, Fire Chiefs Association of Central Ohio, Galena, Ohio

John P. Moore, EMTP, Fire Fighter/Paramedic Instructor, Division of Fire/Emergency Medical Services, Columbus, Ohio

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

Kevin J. Pugh, MD, Director, Division of Trauma, Department of Orthopedics, The Ohio State University Hospitals, Columbus, Ohio

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

May-lee Robertson, DO, Emergency Services, Licking Memorial Hospital, Newark, 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

Jody Ciccone Snyder, RN, BSN, New Albany Surgical Hospital, New Albany, Ohio

Kimberly S. Thompson, RN, BSN, Nurse Director Emergency Department and Critical Care, Grady Memorial Hospital, Delaware, Ohio

Susan Tilgner, MS, RD, Franklin County Health Commissioner, Franklin County Board of Health, Columbus, Ohio

Carla Withers, RN, BSN, CEN, Manager Emergency Services, Berger Health System, Circleville, Ohio



COTS work involves a number of initiatives besides the Regional Trauma Registry and this report. COTS initiatives are established via a community collaboration process through the dedicated efforts of over 200 local volunteers who serve on a COTS committee and participate in the regional trauma system. The following agencies served on one or more of COTS Committees in 2003:

Arthur G. James Cancer Hospital, *Columbus, Ohio*
 Battelle Memorial Institute, *Columbus, Ohio*
 Berger Health System, *Circleville, Ohio*
 Bucyrus Community Hospital, *Bucyrus, Ohio*
 Central Ohio Amateur Radio Relay Services, *Columbus, Ohio*
 Central Ohio Poison Control Center, *Columbus, Ohio*
 Central Ohio Fire Chiefs' Association, *Galena, Ohio*
 Children's Hospital, *Columbus, Ohio*
 City of Columbus, Division of Fire, *Columbus, Ohio*
 Clinton Township Fire Department, *Columbus, Ohio*
 Columbus Coalition Against Family Violence, *Columbus, Ohio*
 Columbus Health Department, *Columbus, Ohio*
 Columbus Medical Association & Foundation, *Columbus, Ohio*
 Coshocton County Memorial Hospital, *Coshocton, Ohio*
 Delaware County Fire Department, *Delaware, Ohio*
 Doctors Hospital, *Columbus, Ohio*

Fairfield Medical Center, *Lancaster, Ohio*
 Fayette County Memorial Hospital, *Washington Court House, Ohio*
 Franklin County Board of Health, *Columbus, Ohio*
 Franklin County Coroner's Office, *Columbus, Ohio*
 Franklin County Fire Chiefs' Association, *Columbus, Ohio*
 Franklin County Emergency Management Agency, *Columbus, Ohio*
 Franklin County Prosecutor's Office, *Columbus, Ohio*
 Franklin Township Fire Department *Columbus, Ohio*
 Galion Community Hospital, *Galion, Ohio*
 City of Grandview Heights, Division of Fire, *Grandview Heights, Ohio*
 Genesis Healthcare System, *Zanesville, Ohio*
 Genoa Township Fire Department, *Galena, Ohio*
 Grady Memorial Hospital, *Delaware, Ohio*
 Grant Medical Center, *Columbus, Ohio*
 Hamilton Township Fire Department, *Columbus, Ohio*
 Hardin Memorial, *Kenton, Ohio*
 City of Hilliard, Division of Police, *Hilliard, Ohio*
 Jackson Township Fire Department, *Grove City, Ohio*
 Jefferson Township Fire Department, *Blacklick, Ohio*
 Jerome Township Fire Department, *Plain City, Ohio*
 Knox Community Hospital, *Mt. Vernon, Ohio*
 Liberty Township Fire Department, *Powell, Ohio*
 Licking Memorial Hospital, *Newark, Ohio*
 Madison County Hospital, *London, Ohio*
 Madison Township Fire Department, *Groveport, Ohio*
 Marion General Hospital, *Marion, Ohio*

Mary Rutan Hospital, *Bellefontaine, Ohio*
 Med Central Crestline Hospital, *Crestline, Ohio*
 Memorial Hospital of Union County, *Marysville, Ohio*
 Mifflin Township Division of Fire, *Gahanna, Ohio*
 Morrow County Hospital, *Mt. Gilead, Ohio*
 Mount Carmel East, *Columbus, Ohio*
 Mount Carmel St. Ann's, *Westerville, Ohio*
 Mount Carmel West, *Columbus, Ohio*
 City of Newark, Division of Fire, *Newark, Ohio*
 Norwich Township Fire Department, *Hilliard, Ohio*
 Ohio Department of Public Safety, EMS Division, *Columbus, Ohio*
 Ohio Domestic Violence Network, *Columbus, Ohio*
 The Ohio State University Hospitals, *Columbus, Ohio*
 The Ohio State University Hospital East, *Columbus, Ohio*
 Plain Township Fire Department, *New Albany, Ohio*
 Prairie Township Fire Department, *Columbus, Ohio*
 Rehabilitation Services, Dodd Hall, The OSU Hospitals, *Columbus, Ohio*
 Riverside Methodist Hospital, *Columbus, Ohio*
 Southeastern Ohio Regional Medical Center, *Cambridge, Ohio*
 State of Ohio Fire Marshal's Office, *Columbus, Ohio*
 Twin Valley Behavioral Health, *Columbus, Ohio*
 Truro Township Fire Department, *Reynoldsburg, Ohio*
 City of Upper Arlington, Division of Fire, *Upper Arlington, Ohio*
 Violet Township Fire Department, *Pickerington, Ohio*
 Washington Township Fire Department, *Dublin, Ohio*
 Wyandot Memorial Hospital, *Upper Sandusky, Ohio*



Message from the COTS President

This Central Ohio Trauma System (COTS) 2004 Report—Motor Vehicle Traffic Crash and Assault Injuries in Central Ohio—focuses on two serious injury mechanisms in central Ohio. Motor vehicle crashes include any collisions that involve a motorized vehicle such as car, truck, van, or motorcycle. The collision may be with another motorized vehicle, a pedestrian, a pedalist (someone riding a bike), or stationary object. Nearly all motor vehicle crashes are unintentional. By contrast, assaults are, by definition, intentional injuries that are inflicted by one human being on another. When an assailant is related to the victim (or lives in the same household), the resulting injury is given a special category such as child abuse, elder abuse, or domestic violence. Where as virtually all stabbings, fistfights, and strangulations are intentional injuries, firearm trauma—because many weapons can be discharged by a child—may be intentional or unintentional. As this COTS report shows,

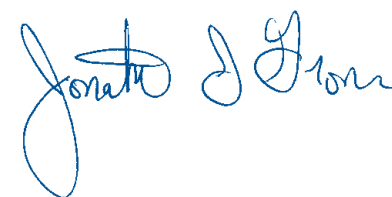
both motor vehicle traffic crash and assault injuries are significant causes of permanent disability and death in the central Ohio community.

National statistics involving motor vehicle crashes and assaults are equally significant as those reported here for Franklin County and central Ohio. Across the U.S., motor vehicle crashes are the leading cause of injury death among persons ages 1-64, and the leading cause of death overall among persons ages 1-34.¹ Domestic violence is the leading cause of injury among women 14 to 44 years of age,² and nearly a million American children are victims of child abuse each year.³ Finally, nearly 30,000 people were killed by firearms in the U.S. in 2002 with over 2,000 of those slain being children.⁴

The Central Ohio Trauma System—COTS—is in its fifth year of maintaining the regional

trauma registry. The COTS Registry has over 20,000 injury records from all mechanisms of injury in central Ohio. This data is made possible through the dedication of the central Ohio hospitals and health information staff who realize the value of the collective knowledge that such work brings. COTS data is available to community stakeholders and researchers who are interested in injury prevention. The Columbus Health Department, COTS, and central Ohio hospitals hope that the knowledge generated in this report will help us strive to reduce injuries and save lives in the central Ohio community.

Sincerely,



1 Centers for Disease Control and Prevention, Web-based Injury Statistics Query an Reporting System (WISQARS), <http://webapp.cdc.gov/cgi-bin/broker/exe> as of October 1, 2004

2 National Coalition Against Domestic Violence, Domestic Violence Facts, <http://www.ncadv.org> as of January 8, 2003

3 U.S. Department of Health and Human Services, National Clearinghouse on Child Abuse and Neglect, National Child Abuse and Neglect Data System (NCANDS), <http://www.acf.dhhs.gov/programs/cb/publications/cm02/summary.htm> as of January 8, 2003

4 Centers for Disease Control and Prevention, Web-based Injury Statistics Query an Reporting System (WISQARS), <http://webapp.cdc.gov/cgi-bin/broker/exe> as of October 1, 2004



This is the Central Ohio Trauma System's (COTS) fourth annual report of injury related hospitalizations and fatalities in the Central Ohio Region. The COTS region encompasses fourteen counties. All fourteen central Ohio counties have one hospital each except for Franklin County which has nine hospitals. Much of the data presented in this report focuses on Franklin County for two reasons: (1) It is the most populous county in the region with 1,000,000 people; and (2) It allows data to be anonymously aggregated because of the county's multiple hospitals. Confidentiality of patients is paramount.

Information in this report is based on residents of Central Ohio who were admitted to a local hospital in 2003 with a length of stay for at least 48 hours or patients transferred from one hospital to another in central Ohio. Additionally vital statistics records for Franklin County residents from 2001 and 2002 were used to document injury-related fatalities.

Injuries continue to be the 5th leading cause of death for Franklin County. The average number of fatalities per year in 2001 and 2002 was 512. This compares to an average of 449 for 2000 and 2001. The difference represents a 14% increase in injury-related fatalities in our community. For non-fatal 48 hour or longer injury-related hospitalizations there is no difference between 2002 and 2003 data. In 2002 there were 2,523 48 hour or longer hospitalizations and in 2003 there were 2,532.

The report provides in-depth information about motor vehicle traffic (MVT) and assault injuries. These are two of the top three contributors to injury fatalities in Franklin County. In 2001 and 2002:

- MVT crashes accounts for an average of 106 fatalities per year.
- Homicide accounts for an average of 85 fatalities per year.
- Suicide accounts for an average of 120 fatalities per year.

Of residents hospitalized 48 hours or longer due to a MVT crash in 2003:

- 676 were residents of Franklin County.
- 1,853 were residents of the 14 county Central Ohio region including Franklin County.

Of residents hospitalized for Assault injuries:

- 351 were residents of Franklin County.
- 514 were residents of the 14 county Central Ohio region.

Franklin County residents accounted for 36% of all MVT crash-related hospitalizations of 48 hours or longer and 68% of all assault related hospitalizations.

This report is made possible by the ongoing collaboration between the Central Ohio Trauma System (COTS), the Columbus Health Department, and the Franklin County Safe Communities Coalition. The Ohio Department of Public Safety provided funding for the analysis

of the data for this report. The consistency of the data and data sources allow the Central Ohio community to observe trends and more precisely focus on areas needing attention to prevent injury related death and disability. One example is the current focus on pedestrian injuries in Columbus and Franklin County. As a result of this community-wide focus, the county has seen a 9% decrease in pedestrian related 48 hour hospitalizations and a 10% decrease in pedestrian related MVT crashes in Columbus. The combined efforts of the Franklin County Safe Communities partners are responsible for this reduction in pedestrian crashes.

This report is intended to provide direction for future activities. For more information regarding injury prevention programming by Franklin County Safe Communities Partners please call Mike Smeltzer at the Columbus Health Department, (614)645-6751 or email mikes@columbus.gov.



A Message from Columbus Health Commissioner Dr. Teresa Long

This fourth collaborative report on Injuries in Franklin County and Central Ohio adds to our understanding of this major public health concern. Injuries are not “accidents”. They are predictable and preventable. From year to year we observe similar patterns for population groups at greater and lesser risk for sustaining injuries. Because of this information, our public health system, which includes all of the partners involved in publishing this report as well as others, can respond effectively and efficiently to reduce the number and seriousness of injuries in our community.

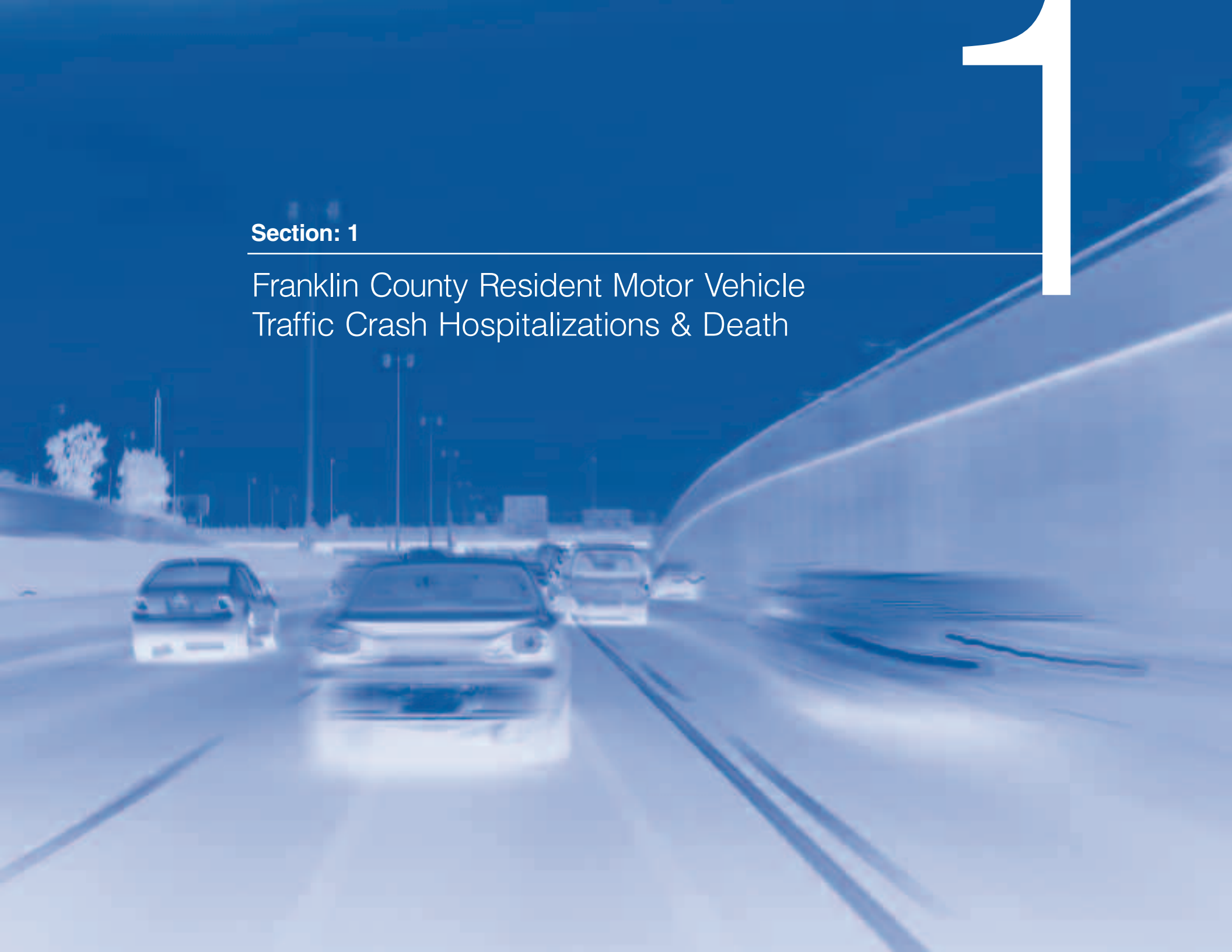
The 2004 report focuses on Motor Vehicle Traffic and Assault injuries. Together these causes accounted for 41% of all injury related 48 hour or longer admissions to a Franklin County hospital. If we can come together to make an impact on these mechanisms we will reduce the suffering and loss individuals and families experience from a tragic event. The value of this report will be in how the information is utilized to inform our education, engineering, and enforcement initiatives to prevent injuries.

Teresa C. Long MD



Section: 1

Franklin County Resident Motor Vehicle
Traffic Crash Hospitalizations & Death



Section 1: Franklin County COTS Data: Non-Fatal MVT Hospitalizations

Introduction

Motor vehicle traffic (MVT) crash is the second leading mechanism of non-fatal injury resulting in two or more days of hospitalization in 2003 among Franklin County residents. Overall, MVT crashes accounted for 27% (676 of 2532) of non-fatal injuries resulting in two or more days of hospitalization (Table 5.2). In addition to the 676 MVT crash related hospitalizations, the Ohio Department of Public Safety Franklin County Crash Reports indicates another 15,000 people were injured less severely in a MVT crash in 2003.

Who

Most MVT crash related hospitalizations in 2003 were drivers or passengers of the motor vehicle [73% (492)]. However, 12% (79) were pedestrians and 11% (72) were riding a motorcycle (Figure 1.1). Comparatively in 2002, there were 656 people hospitalized for two days or longer as a result of a MVT crash, of which occupants accounted for 73% (480), pedestrians 13% (86), and motorcyclists 10% (65) (COTS 2002 Injury Report). Although there was an increase in the total number of MVT crash related hospitalizations between 2002 and 2003 from 656 to 676, it is encouraging that there is a slight decrease in pedestrian related hospitalizations (86 to 79).

More males are hospitalized for two or more days due to a MVT crash than females. In 2003, 365 (54%) males were hospitalized compared

to 311 (46%) females (Figure 1.2). In 2002 there were 394 (60%) males hospitalized compared to 262 (40%) females. Between 2002 and 2003 there was a statistically significant decrease in the number of males hospitalized and a similarly significant increase in the number of females (Figure 1.3) hospitalized.

Franklin County residents in the 15-29 year age-group experienced 200 of 676 (30%) MVT crash related hospitalizations. However the highest rates per 100,000 population were in the older, over 60 years of age age-grouping. This same distribution was also present in 2002 (Figures 1.4 and 1.5).

In Franklin County, the rate of MVT crash hospitalizations for two or more days is 63 per 100,000 population. Residents in specific zip codes have higher or lower rates per 100,000. The zip codes with the highest rates are 43217 (116 per 100,000) and 43222 (113 per 100,000). The zip codes with the lowest rates are 43002, 43016, and 43017 with rates between 42 and 51 per 100,000. In general, residents in Central and North East Columbus are at greatest risk for MVT hospitalization (Figure 1.6, Map 1.1). In 2002, the highest rates per 100,000 were in zip codes 43203 and 43222 with rates of 105 and 111 per 100,000 respectively (COTS 2002 Injury Report).

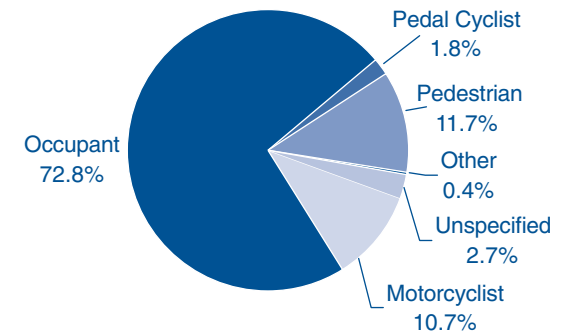


Figure 1.1: Franklin County non-fatal unintentional MVT crash injury hospitalization, by injured person (N=676), 2003 COTS data.

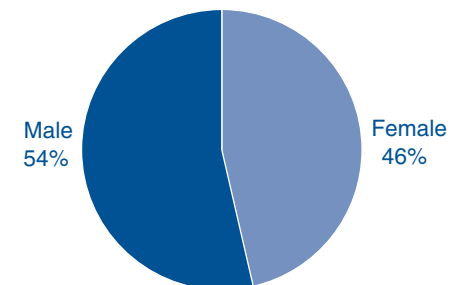


Figure 1.2: Franklin County non-fatal MVT crash hospitalization, by gender (N=676), 2003 COTS data.



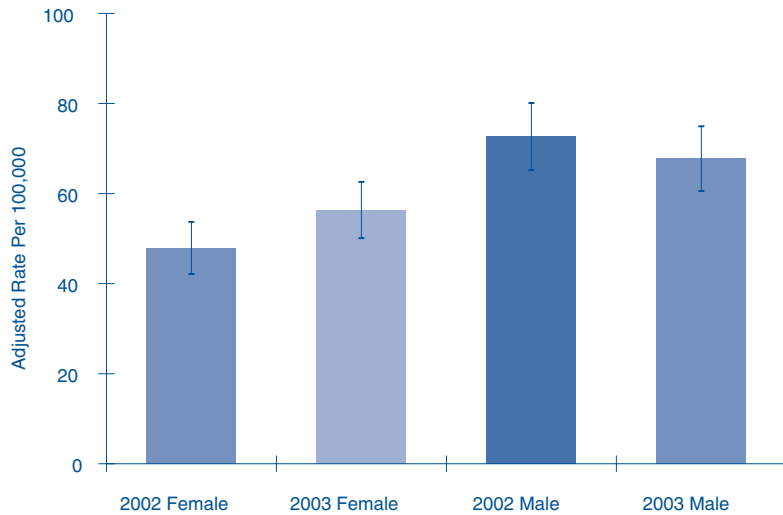


Figure 1.3: Franklin County non-fatal MVT crash injury hospitalization adjusted rate (per 100,000) and 95% confidence intervals, by gender, 2003 COTS data.

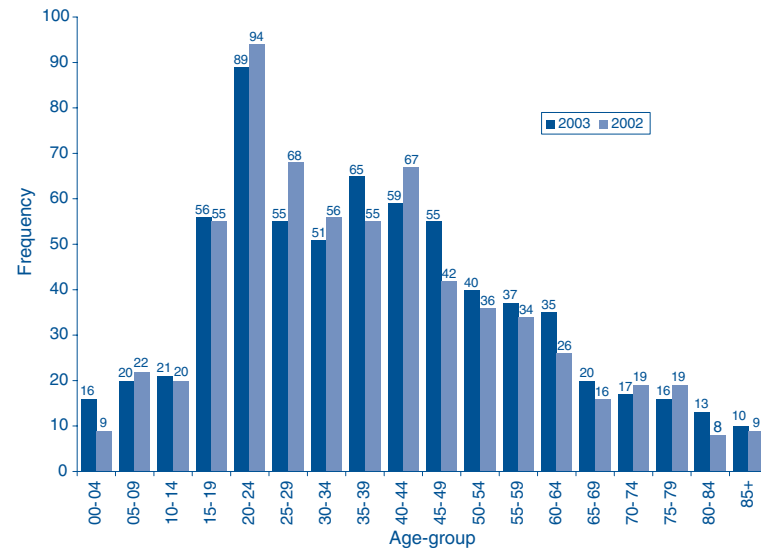


Figure 1.4: Franklin County non-fatal MVT crash injury hospitalization, by age-group, 2002 (N=655) and 2003 (N=675) COTS data

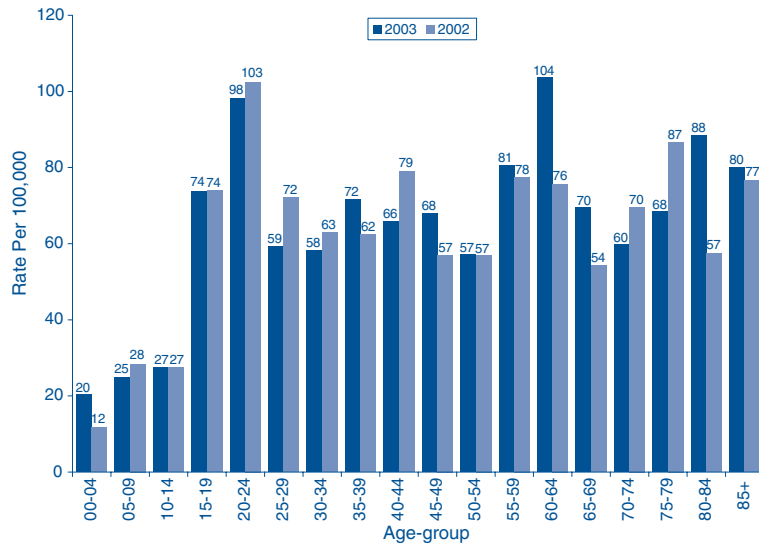


Figure 1.5: Franklin County non-fatal MVT crash injury hospitalization rates (per 100,000), by age-group, 2003 COTS data

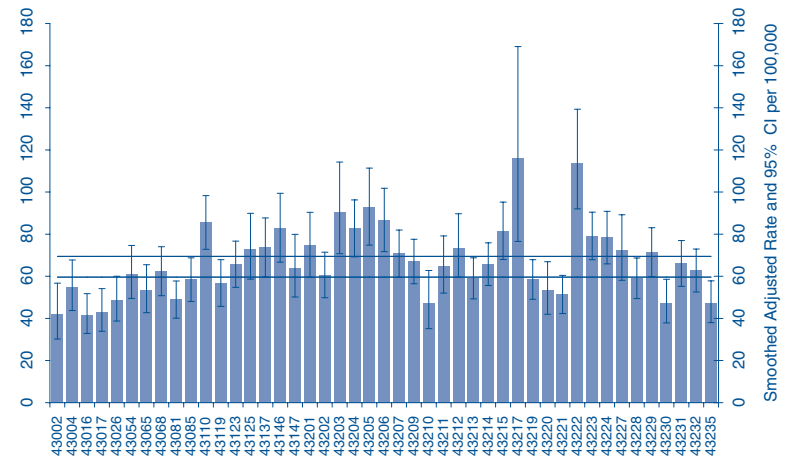


Figure 1.6: Franklin County non-fatal MVT crash injury hospitalization smoothed (see Technical Notes) adjusted rates and 95% confidence intervals, by zip code, 2003 COTS data.



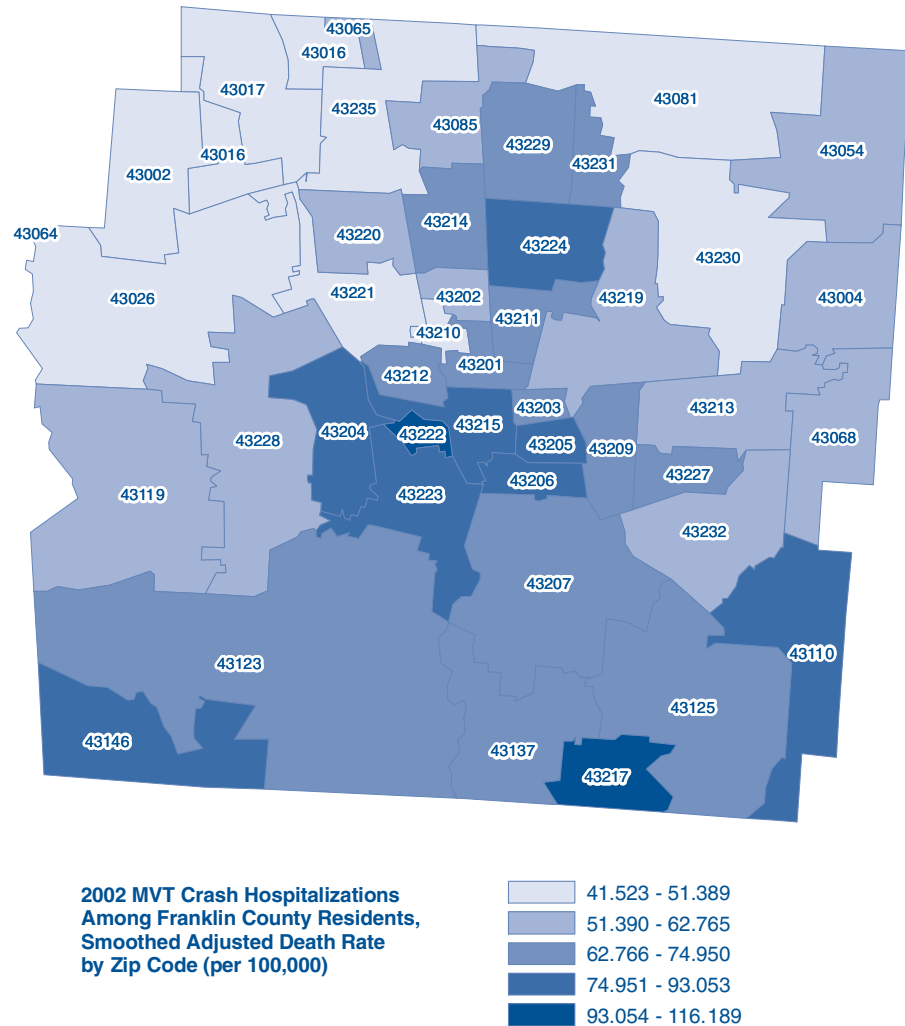
Section 1: Franklin County COTS Data: Non-Fatal MVT Hospitalizations

How Long

The average length of hospital stay for MVT crashes decreased slightly in 2003. The average length of stay in 2003 was 6.2 days compared to 6.3 days in 2002 (Table 1.1).

Person Involved	Mean length of stay (days)	
	2002	2003
Pedestrian	5.8	5.4
Motorcyclist	6.9	5.6
Other	2.5	9.0
Occupant	6.1	6.2
Unspecified	5.5	8.9
Pedal cyclist	13.5	7.7
All Unintentional MVT	6.3	6.2

Table 1.1: Franklin County non-fatal unintentional MVT injury crash average lengths of hospital stay, by person involved, 2002 and 2003 COTS data.



Map 1.1: Franklin County non-fatal MVT crash injury hospitalization smoothed (see Technical Notes) adjusted rates (per 100,000), by zip code, 2003 COTS data.



MVT Occupant Seat belt Use

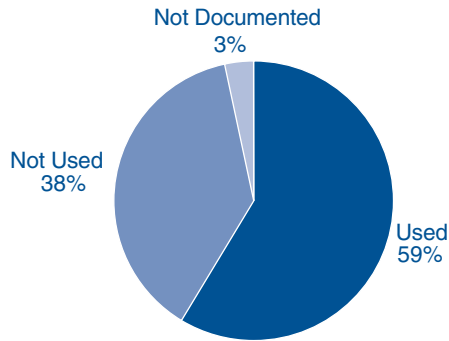


Figure 1.7: Franklin County non-fatal unintentional MVT crash Occupant injury hospitalization (N=492) by seat-belt use, 2003 COTS data

MVT Motorcyclist Helmet Use

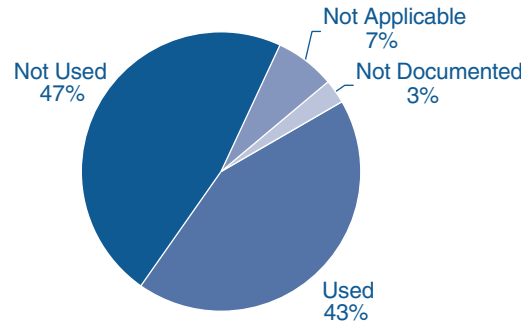


Figure 1.8: Franklin County non-fatal unintentional MVT crash Motorcyclist injury hospitalization (N=72) by helmet use, 2003 COTS data.

Safety Device Use

“Safety belts, when used, reduce the risk of fatal injury to front seat passenger car occupants by 45%” (NHTSA Traffic Safety facts 2003).

In 2003, the average safety belt use in Franklin County was 70% (*2003 Safe Communities Survey*). For occupants of a motor vehicle involved in a MVT crash who were hospitalized for two or more days, the safety belt use rate was 59% (Figure 1.7). Many of these injuries may have been less severe if a safety belt had been used.

Nationally, motorcycle helmet use is 58% (2002, NHTSA Use Survey). In Franklin County, the helmet use rate for motorcyclists involved in a MVT crash requiring two or more days of hospitalization was 43% (Figure 1.8). Again, injuries may have been less severe if helmets had been used. Ohio law requires motorcycle drivers and passengers under 18 years old to wear an approved helmet.

In 2003, there were 12 pedal-cyclist related MVT crash hospitalizations, with an average hospitalization of 7.7 days. Only one was wearing a helmet (Figure 1.9).

MVT Pedalcyclist Helmet Use

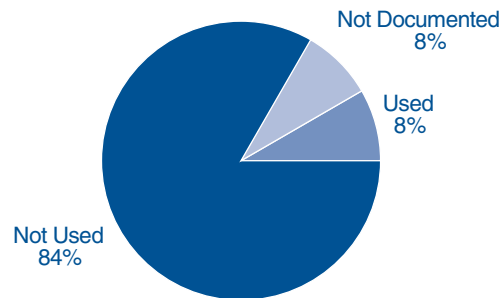


Figure 1.9: Franklin County non-fatal unintentional MVT crash Pedal Cyclist injury hospitalization (N=12) by helmet use, 2003 COTS data.

“Helmets are estimated to be 37% effective in preventing fatal injuries to motorcyclists” (NHTSA Traffic Safety facts 2003).



Section 1: Franklin County COTS Data: Non-Fatal MVT Hospitalizations

Traumatic Brain Injuries

Traumatic brain injuries (TBI) are caused by an external force to the head and can result in physical, psychosocial, and/or cognitive impairment. Of the 6,287 total injury admissions to central Ohio hospitals in 2003, 1,298 had a nature of injury code included in the criteria for TBI. Of the total 1,298 TBIs, 651 (50%) were related to or involved in a motor vehicle crash (Figure 1.10), with 590 surviving. Of the 651 total TBIs related to a MVT crash, 238 (37%) were among Franklin County residents. Of the 238 total Franklin County resident TBIs related to a MVT crash, 214 survived. The Centers for Disease Control and Prevention (CDC) has estimated that one-third of persons hospitalized for TBI who survive will experience long-term disability (*Traumatic Brain Injury in the United States*, CDC, October 2004).

Of the Franklin County residents who were hospitalized for a MVT crash and suffered a TBI, a vast majority were occupants in a motor vehicle (72%), followed by pedestrians (13%), and motorcyclists (11%) (Figure 1.13). Males accounted for 126 (59%) of TBIs related to MVT crashes among Franklin County residents (Figures 1.11). According to the Centers for Disease Control and Prevention (CDC), MVT crashes are the leading cause of TBI for 15-24 year olds. (*Traumatic Brain Injuries in the United States*, CDC, October 2004). This is the same age group in Franklin County that is at increased risk for MVT crashes and TBI (Figures 1.5, 1.14, 1.15).

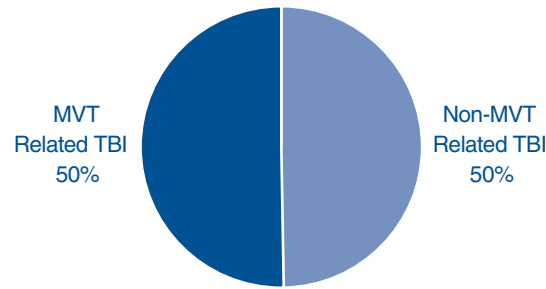


Figure 1.10: Percentage of Motor and Non-Motor Vehicle Related Traumatic Brain Injury among All Injury Admissions to a central Ohio Hospital, 2003.

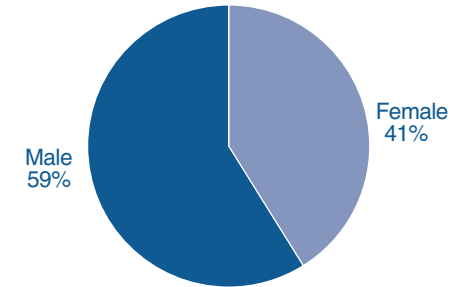


Figure 1.11: Percentage of Male and Female Central Ohio Hospital Motor Vehicle Crash Admissions Resulting in Traumatic Brain Injury, Franklin County Residents Only, 2003.

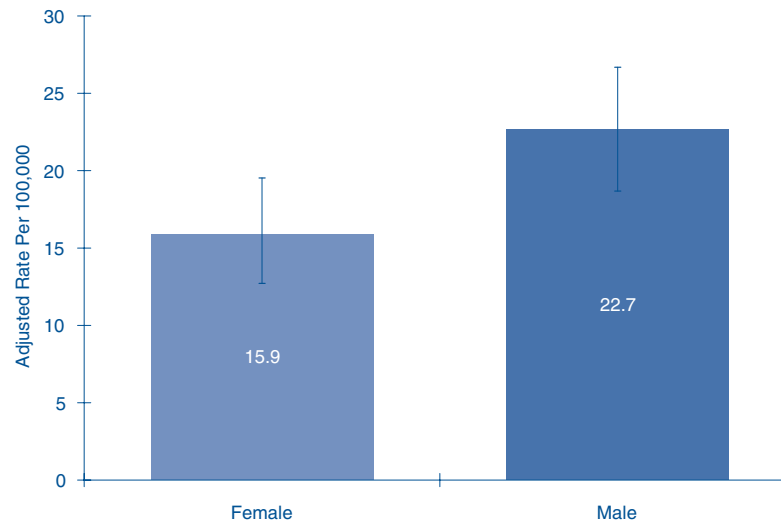


Figure 1.12: Age-adjusted Rate and 95% Confidence Interval for Male and Female Central Ohio Hospital Motor Vehicle Crash Admissions Resulting in Traumatic Brain Injury, Franklin County Residents Only, 2003.



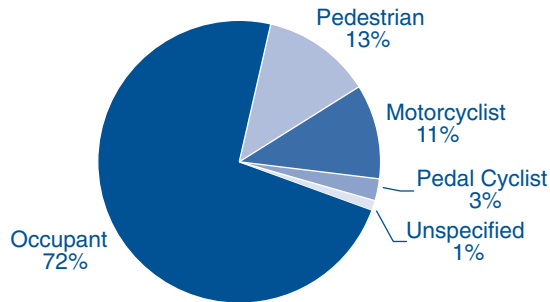


Figure 1.13: Percentage of Central Ohio Hospital Motor Vehicle Crash Admissions Resulting in Traumatic Brain Injury, by Injured Person, Franklin County Resident Only, 2003.

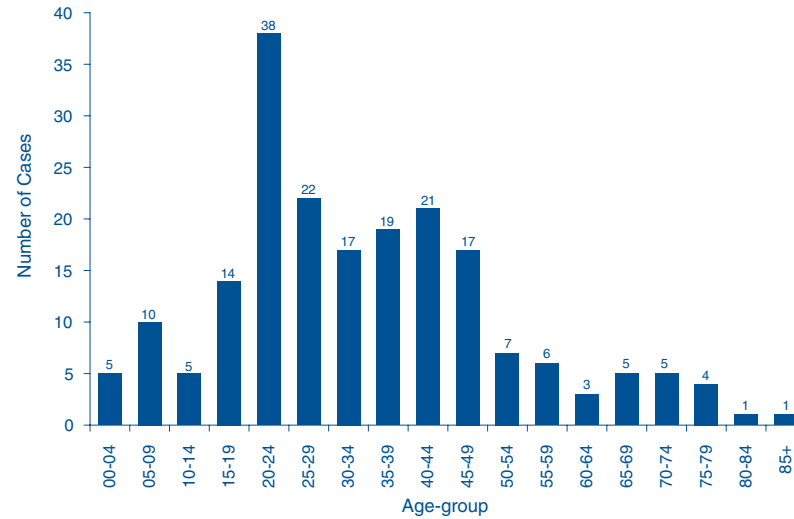


Figure 1.14: Number of Central Ohio Hospital Motor Vehicle Crash Admissions Resulting in Traumatic Brain Injury by Injured Person, by Age, Franklin County Resident Only, 2003.

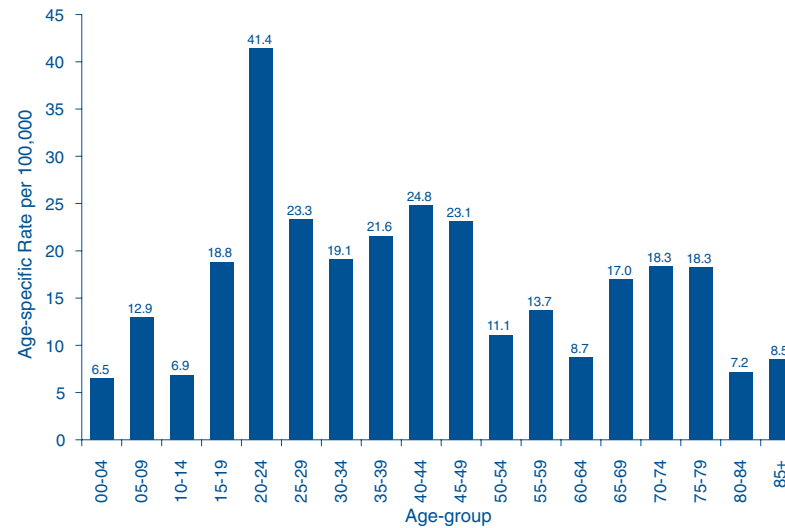


Figure 1.15: Age-specific Rates for Central Ohio Hospital Motor Vehicle Crash Admissions Resulting in Traumatic Brain Injury by Injured Person, Franklin County Resident Only, 2003.



Section 1: Franklin County COTS Data: Non-Fatal MVT Hospitalizations

Traumatic Brain Injuries and Safety Device Use

As mentioned, the use of seat belts and motorcycle and bicycle helmets can significantly reduce fatalities and the severity of injuries. The 2003 COTS data indicates that there may be a strong relationship between safety belt and motorcycle helmet use and TBI. The rate of non-use of a safety belt for TBI related MVT crashes was 53% compared to a 38% non-use rate for all MVT crash hospitalizations of two or more days (Figures 1.7 and 1.16). This represents a 40% greater seat belt non-use rate for TBI related MVT crash hospitalizations compared to all MVT crash hospitalizations. There is an even greater discrepancy for non-use of motorcycle helmets and TBI. There was a 75% helmet non-use rate among motorcycle crash hospitalizations resulting in a TBI compared to a 47% helmet non-use rate among all motorcycle crash hospitalizations of two or more days (Figures 1.8 and 1.17).

MVT Occupant TBI Seat belt Use

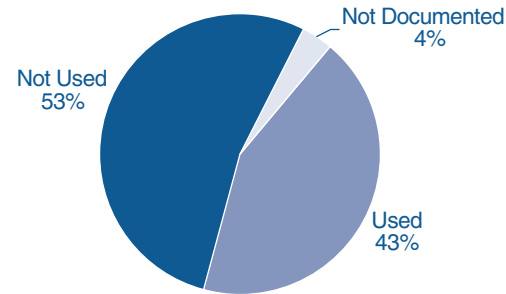


Figure 1.16: Percentage of Central Ohio Hospital Motor Vehicle Crash Occupant Admissions Resulting in Traumatic Brain Injury, by Seat Belt Use, Franklin County Resident Only (N=163), 2003.

MVT Motorcyclist TBI Helmet Use

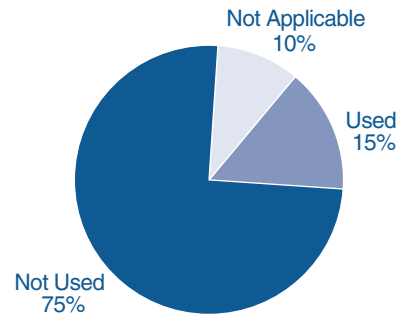


Figure 1.17: Percentage of Central Ohio Hospital Motor Vehicle Crash Occupant Admissions Resulting in Traumatic Brain Injury, by Seat Belt Use, Franklin County Resident Only (N=163), 2003.



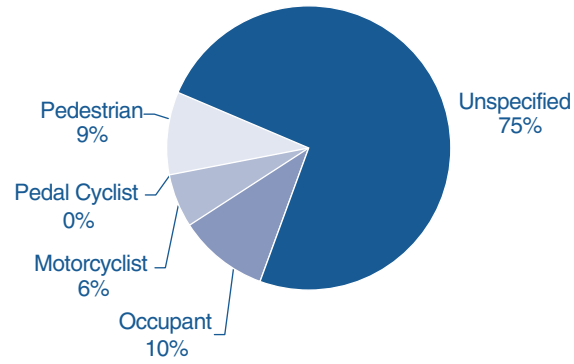


Figure 1.18: Franklin County unintentional MVT crash injury death, by injured person (N=116), 2002.

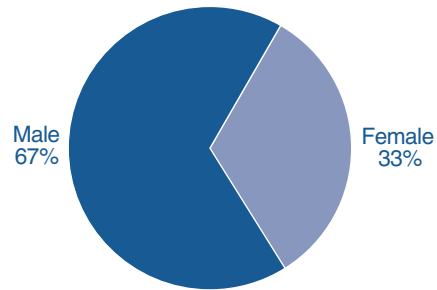


Figure 1.19: Motor vehicle traffic crash death, by gender (Average N=116), 2002.

Introduction

Motor vehicle traffic crashes are the second leading mechanism of injury death in Franklin County for the years 2001-2002. (Firearms are the leading mechanism of injury death for Franklin County residents.) In the years 2000-2001, there were an average of 83 MVT crash related deaths per year. In 2001-2002 the average was 106 per year—a 28% increase. MVT crashes accounted for 21% (106/512 average per year) of all injury deaths for 2001-2002 (Table 6.3, Fig. 6.1).

Who

A large majority (75%) of MVT related deaths were coded as “unspecified” for type of crash or who the injured person was (Fig. 1.18, Franklin County vital statistics data). The proportion of MVT injury deaths coded as “unspecified” type or person has increased over the years from an average of 23% in 1990-1998, 31% in 1999-2000, 64% in 2000, 73% in 2001, and 75% in 2002.



Section 1: Franklin County Mortality Data: MVT Related Deaths

In 2002, 78 Franklin County males died in a motor vehicle traffic crash compared to 38 females. The fatality percentage and rate for males was 67% or 15.1 per 100,000 compared to 33% or 6.6 per 100,000 for females (Fig. 1.19 and 1.20). This may be related to male driving behaviors and/or that males drive more than females. The difference in hospitalizations for two or more days is not as great (54% males, 46% females). The male to female fatality disparity was also present in 2000-2001 (COTS 2002 Injury Report).

The age-groups most at risk for MVT fatalities are 15-19 (12 fatalities) and 65-69 (5 fatalities) (Figure 1.21). Ages 15-34 accounted for over 40% of all MVT fatalities. Males 15-19 are at highest risk for MVT fatality with a rate of 27 deaths per 100,000. For females the highest risk age-group is 30-34 with a rate of 17 per 100,000 (Figures 1.22 through 1.25). Geographic distribution of Franklin County resident MVT crash death rates indicate that residents in the southern parts of Franklin County have the highest rates of MVT fatalities (Figure 1.26, Map 1.2)

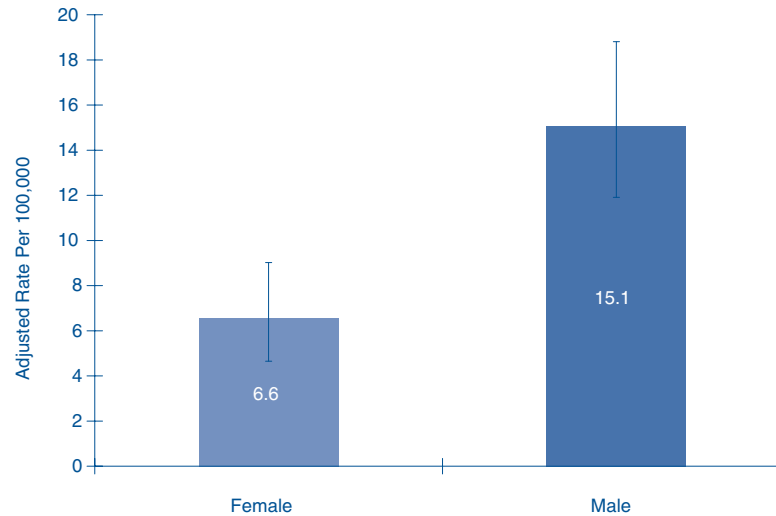


Figure 1.20: Franklin County MVT crash injury death adjusted rate (per 100,000) and 95% confidence intervals, by gender, 2002.

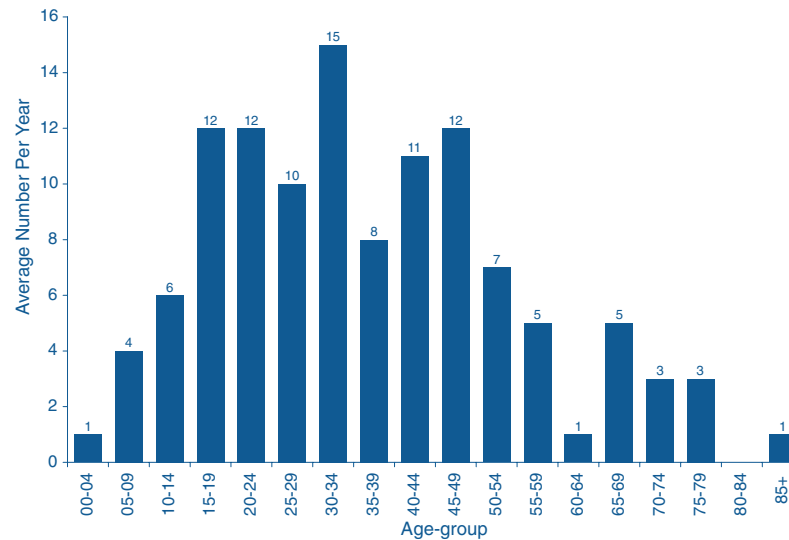


Figure 1.21: Franklin County MVT crash injury deaths, by age-group (N=116), 2002.



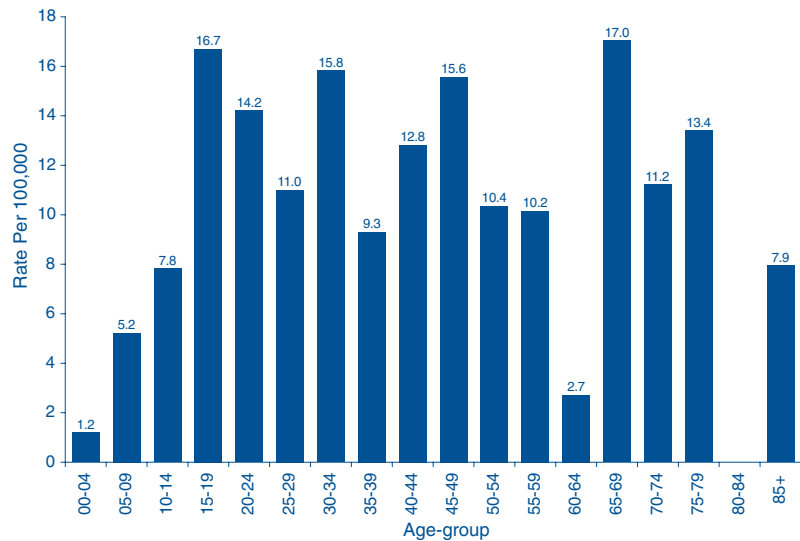


Figure 1.22: Franklin County MVT crash injury death rates (per 100,000), by age-group, 2002.

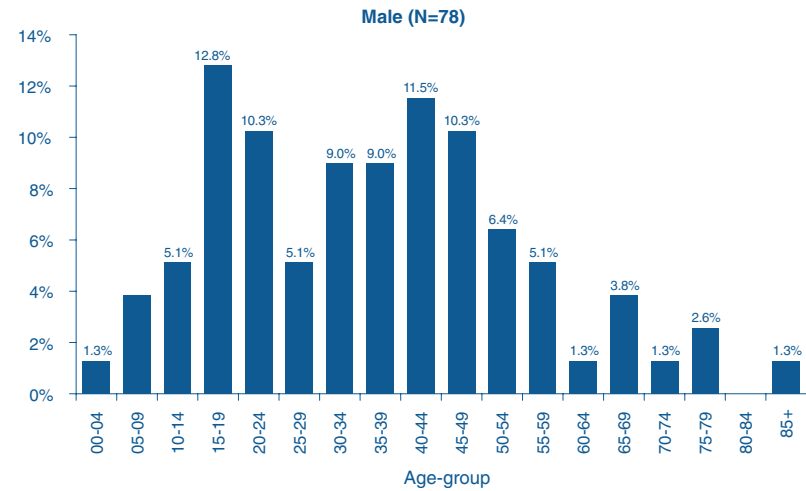


Figure 1.23: Franklin County Male MVT crash injury deaths, by age-group, 2002.

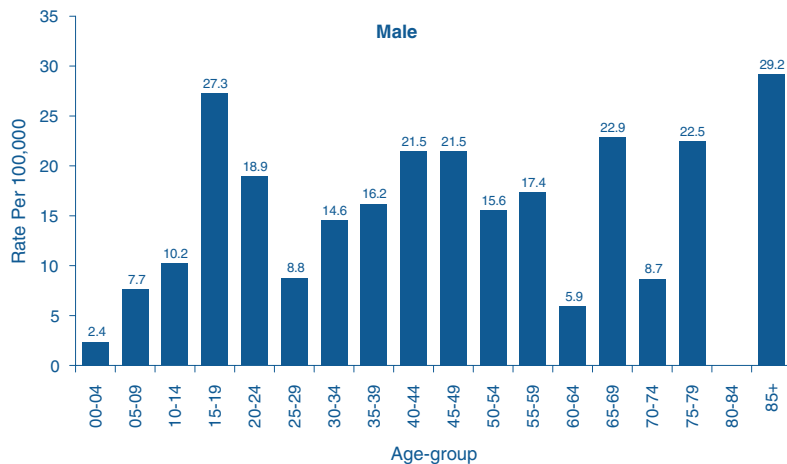


Figure 1.24: Franklin County Male MVT crash injury death rates (per 100,000), by age-group, 2002.

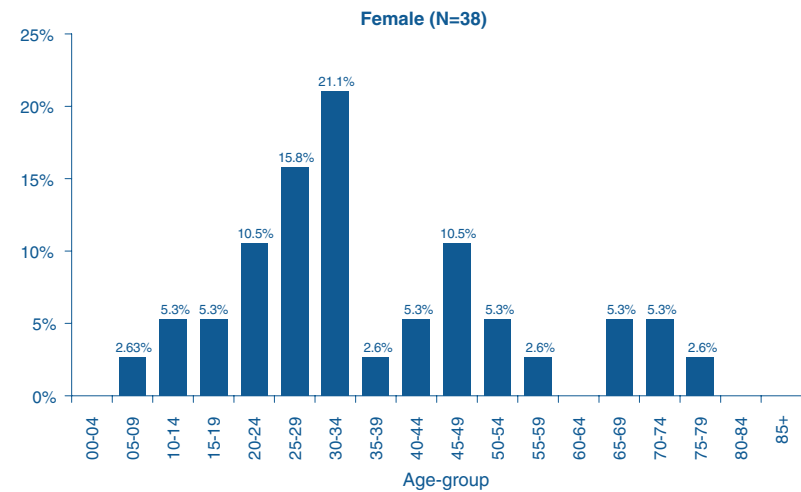


Figure 1.25: Franklin County Female MVT crash injury deaths, by age-group, 2002.



Section 1: Franklin County Mortality Data: MVT Related Deaths

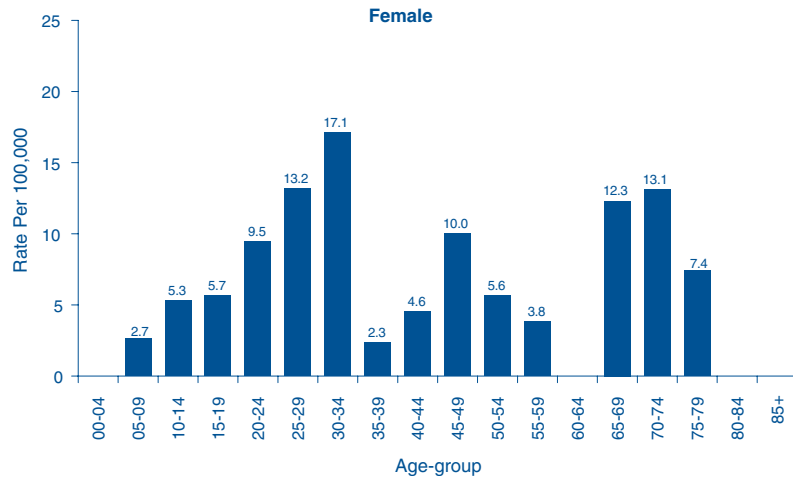


Figure 1.26: Franklin County Female MVT crash injury death rates (per 100,000), by age-group, 2002..

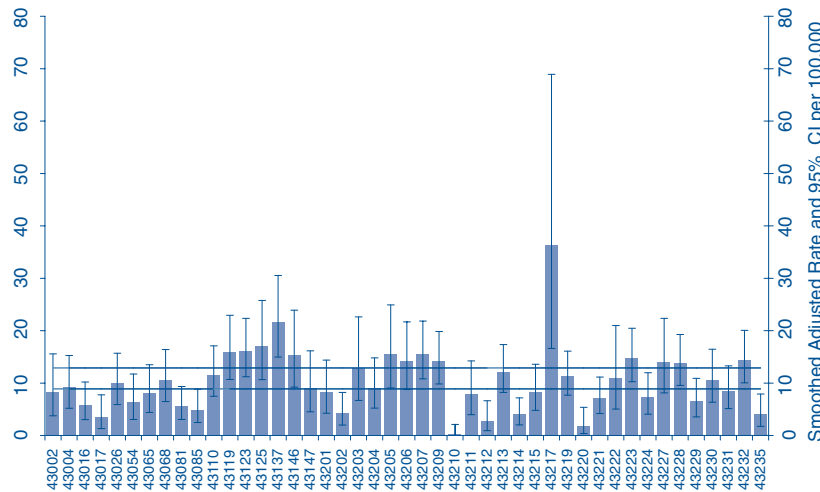
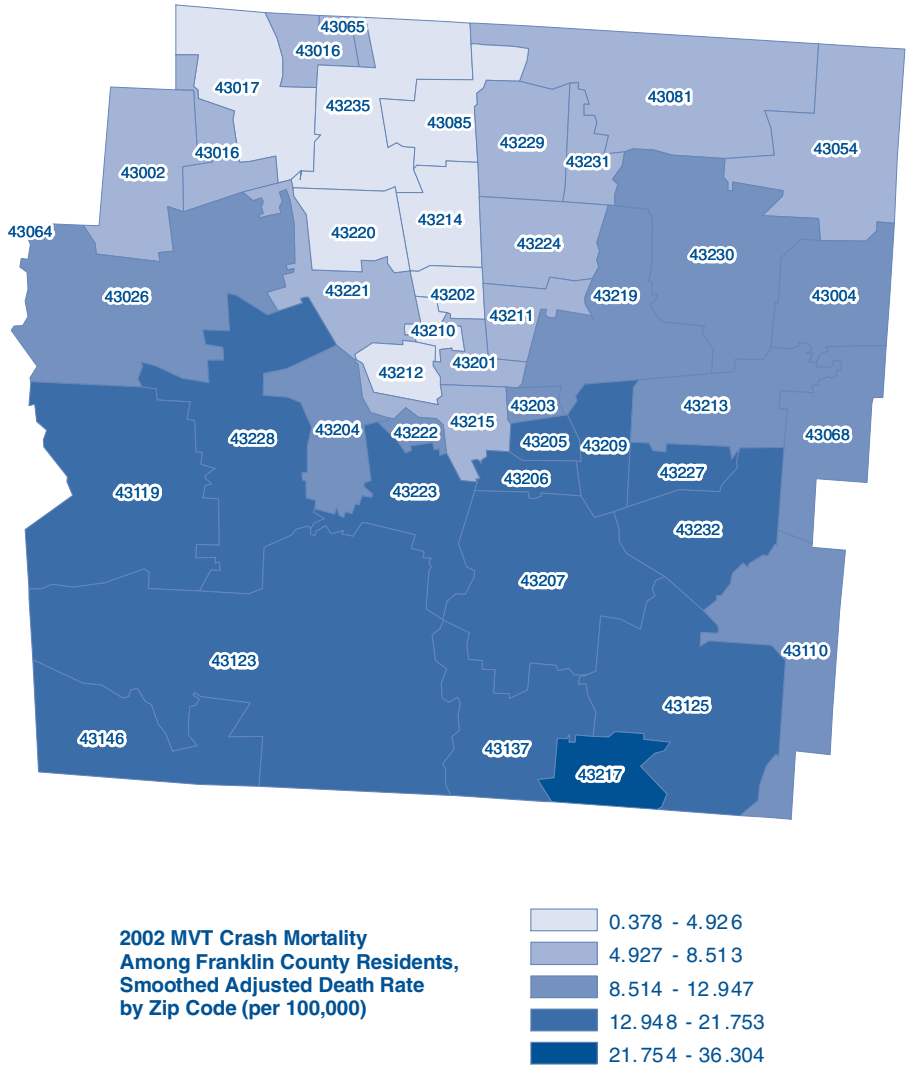


Figure 1.27: Franklin County MVT crash injury death smoothed (see Technical Notes) adjusted rates and 95% confidence intervals, by zip code, 2002 mortality data.



Map 1.2: Franklin County MVT crash injury deaths smoothed (see Technical Notes) adjusted rates (per 100,000) by zip code, 2002.



2

Section: 2

Summary of Franklin County
Assault Injury Hospitalizations

Section 2: Franklin County COTS Registry Data: Non-Fatal Assault Hospitalizations

Introduction

Assaults resulting in two or more days of hospitalization make up approximately 13.9% of all Franklin County resident injury hospitalizations of two or more days. Additionally, 68% (351 out of 514) of all assault hospitalizations of two or more days in the entire COTS region occurred among Franklin County residents.

What - Mechanism of Injury

Among Franklin County resident assault hospitalizations for two or more days, nearly two out of every five are due to firearms or explosives. A majority (54%) of firearm assaults were from a handgun. Additionally, one in five assault hospitalizations were from fights or brawls (Figure 2.1, table 2.1).

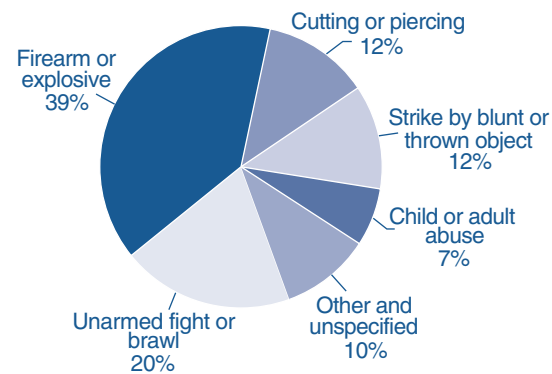


Figure 2.1: Figure 2.1: Franklin county leading mechanisms of assault injury hospitalizations (N=351), 2003 COTS data.

Mechanism	Number	Percent of Total	Adjusted Rate (per 100,00)
Unarmed Fight, Brawl, Other	69	19.7%	6.28
Unarmed fight or brawl	67	19.1%	6.08
Other	2	0.57%	0.195
Firearm or Explosive	138	39.3%	12.3
Handgun	75	21.4%	6.64
Shotgun	7	1.99%	0.669
Other and unspecified firearm	54	15.4%	4.81
Anti-personnel bomb	1	0.28%	0.099
Unspecified explosive	1	0.28%	0.099
Cutting or Piercing Instrument	43	12.3%	3.87
Strike by blunt or thrown object	42	12.0%	3.86
Child or Adult Abuse	23	6.56%	2.06
by Father, stepfather, boyfriend	1	0.28%	0.073
by Spouse or Partner	8	2.28%	0.706
by Child	2	0.57%	0.251
by Sibling	1	0.28%	0.099
By Non-related caregiver	1	0.28%	0.084
By Unspecified person	10	2.85%	0.844
Other and Unspecified	35	9.9%	3.18
Fire	1	0.28%	0.099
Air gun	1	0.28%	0.074
Human bite	3	0.85%	0.290
Other specified	8	2.28%	0.752
Unspecified	22	6.27%	1.97
Latte Effects of Injury	1	0.28%	0.122
Total	351		31.7

Table 2.1: Franklin County assault hospitalizations by mechanism, 2003 COTS data.



Attribute	All Assaults	Unarmed Fight or Brawl	Firearm or Explosive	Cutting or piercing Instrument	Strike by blunt or Thrown Object	Child adult abuse	Other or Unspecified
Total Number	351	69	138	43	42	23	35
Gender	Number & Percent of Category						
Males	295 (84.0%)	54 (78.3%)	131 (94.9%)	36 (83.7%)	35 (83.3%)	8 (34.8%)	30 (85.7%)
Females	56 (16.0%)	15 (21.7%)	7 (5.1%)	7 (16.3%)	7 (16.7%)	15 (65.2%)	5 (14.3%)
Age-Groups	Number & Percent of Category						
0-4	9 (2.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	9 (39.1%)	0 (0.0%)
5-9	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.4%)	0 (0.0%)	0 (0.0%)
10-14	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
15-19	63 (18%)	4 (5.8%)	37 (27%)	8 (18.6%)	7 (16.7%)	2 (8.7%)	5 (14.3%)
20-24	59 (16.9%)	13 (18.8%)	31 (22.6%)	7 (16.3%)	3 (7.1%)	2 (8.7%)	3 (8.6%)
25-29	54 (15.4%)	8 (11.6%)	29 (21.2%)	4 (9.3%)	4 (9.5%)	3 (13%)	6 (17.1%)
30-34	42 (12%)	8 (11.6%)	16 (11.7%)	8 (18.6%)	6 (14.3%)	2 (8.7%)	2 (5.7%)
35-39	29 (8.3%)	7 (10.1%)	3 (2.2%)	7 (16.3%)	2 (4.8%)	2 (8.7%)	8 (22.9%)
40-44	42 (12%)	13 (18.8%)	10 (7.3%)	3 (7%)	10 (23.8%)	0 (0.0%)	6 (17.1%)
45-49	27 (7.7%)	11 (15.9%)	5 (3.6%)	2 (4.7%)	6 (14.3%)	1 (4.3%)	2 (5.7%)
50-54	11 (3.1%)	1 (1.4%)	4 (2.9%)	4 (9.3%)	1 (2.4%)	0 (0.0%)	1 (2.9%)
55-59	5 (1.4%)	2 (2.9%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (5.7%)
60-64	2 (0.6%)	1 (1.4%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
65-69	3 (0.9%)	1 (1.4%)	0 (0.0%)	0 (0.0%)	1 (2.4%)	0 (0.0%)	0 (0.0%)
70-74	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
75-79	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
80-84	3 (0.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.4%)	2 (8.7%)	0 (0.0%)
85+	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Missing age	1 (0.3%)	—	1 (1%)	—	—	—	—

Who

Among all Franklin County resident assault hospitalizations of two or more days, greater than four out of every five are males. Looking at specific types of assault hospitalizations, firearm assaults account for the largest disparity between male and female (95% vs. 5%) assault hospitalizations. Firearm assaults also account for the largest overall number and percentage of all male assault hospitalizations (44%, 131 out of 295), followed by fights or brawls (18.3%, 54 out of 295). Looking at female assault hospitalizations, greater than half of the total assault hospitalizations were due to either child or adult abuse (27%, 15 out of 56) and fights or brawls (27%, 15 out of 56).

Domestic violence is the most common cause of non-fatal assault hospitalizations among females. This COTS data for domestic violence may be under-reported as other categories of assaults such as Unarmed Fight/Brawl, Firearm, Cutting/Piercing, and Struck by Blunt/Thrown Object may also be in the context of a domestic violence situation.

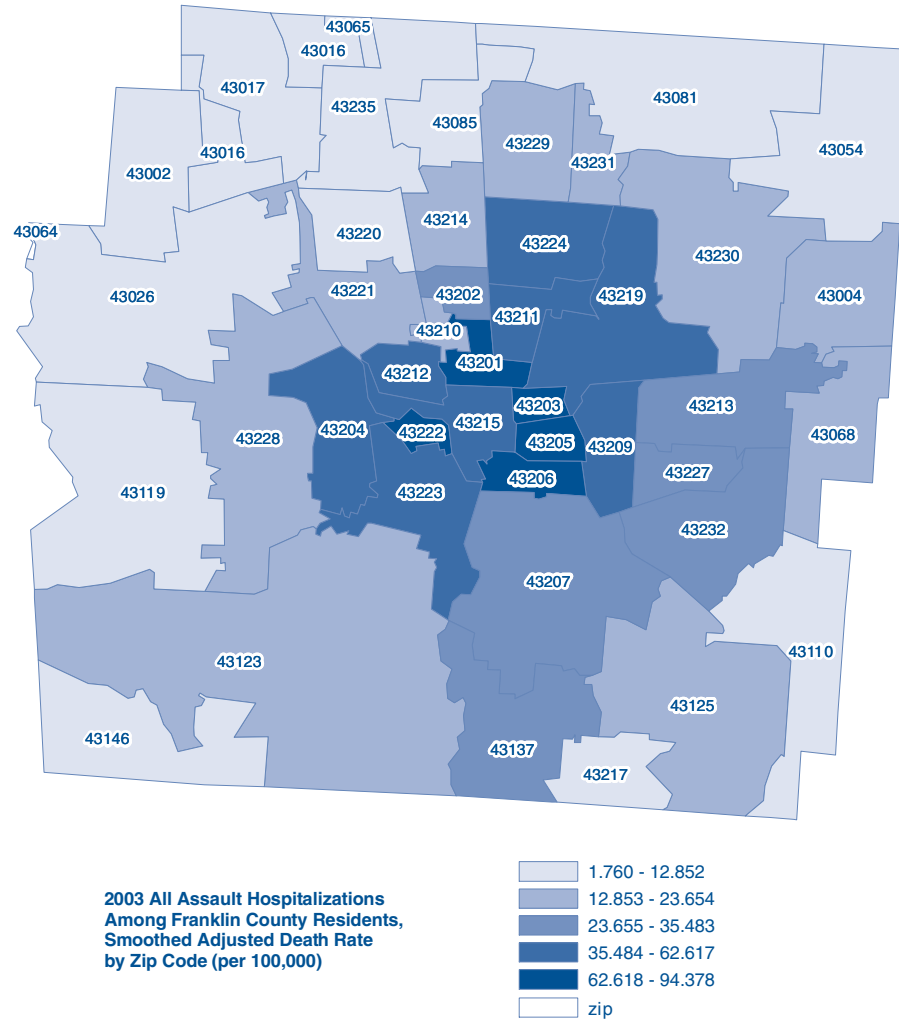
Among all Franklin County resident assault hospitalizations of two or more days, greater than one out of every three are between the ages of 15-24 years. This same 15-24 year age-group accounts for 50% of all assault firearm hospitalizations (Table 2.2).

Table 2.2: Number and percentage of non-fatal assault injury hospitalizations among Franklin County residents, by mechanism, gender, and age-group, 2003 COTS data.



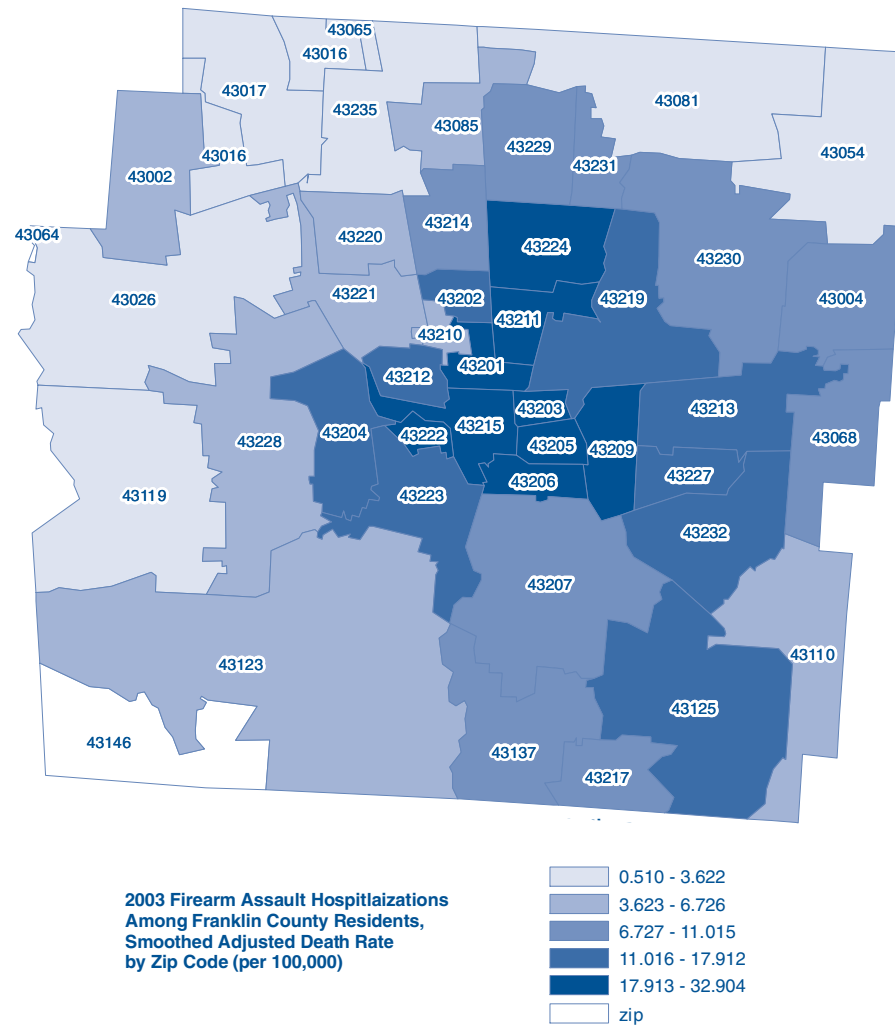
Section 2: Franklin County COTS Registry Data: Non-Fatal Assault Hospitalizations

The geographic distribution of Franklin County resident assault injury hospitalization rates indicate that residents in the central portions of Franklin County have the highest assault injury hospitalization rates (Map 2.1). Similarly, hospitalization rates due to assaults with a firearm are highest among residents in the central and near north areas of Franklin County (Map 2.2).



Map 2.1: Franklin County non-fatal assault injury hospitalizations smoothed (see Technical Notes) adjusted rates (per 100,000), by zip code, 2003 COTS data.





Map 2.2: Franklin County non-fatal firearm assault injury hospitalizations smoothed (see Technical Notes) adjusted rates (per 100,000), by zip code, 2003 COTS data.





3

Section: 3

Summary of Regional Motor Vehicle Traffic Crash Hospitalizations

Section 3: Regional COTS Registry Data: Non-Fatal MVT Hospitalizations

Introduction

Motor vehicle traffic (MVT) crash is the 2nd leading mechanism of non-fatal injury resulting in two or more days of hospitalization in 2003 among regional COTS hospitals, comprising 31.0% (1,853) of all nonfatal injury hospitalizations for two or more days (Table 5.1).

Who

Among regional COTS hospitals in 2003, approximately three out of every four MVT crash hospitalizations for two or more days were occupants in a motor vehicle (Figure 3.1); approximately three out of every five were males (Figure 3.2); and nearly one in two were between 15-24 years of age (Figure 3.3). Although MVT crash hospitalizations for two or more days among COTS member hospitals occur to residents throughout Ohio, the concentration is highest among residents in and around the Franklin County area (Map 3.1).

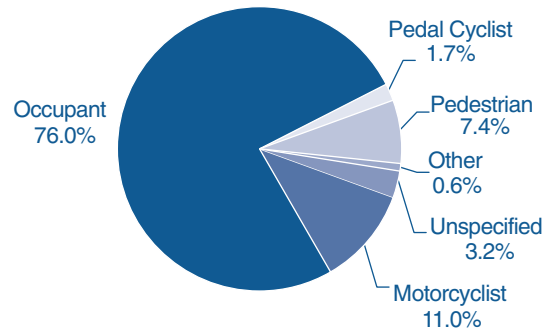


Figure 3.1: Regional non-fatal unintentional MVT crash injury hospitalization, by injured person (N=1,853), 2003 Regional COTS data.

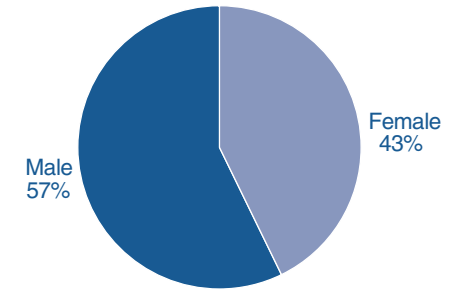


Figure 3.2: Number of Non-fatal MVT crash injury hospitalizations, by gender (N=1,853), 2003 Regional COTS data.

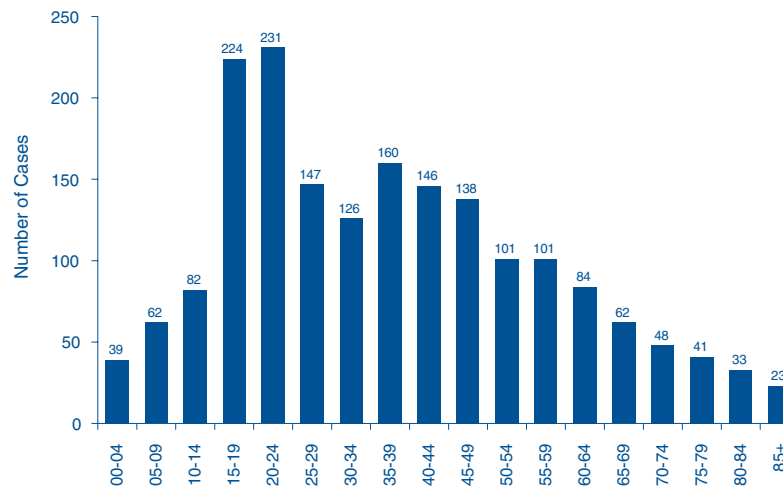
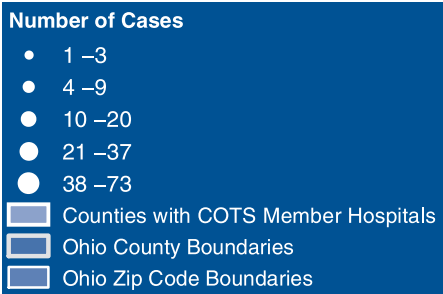
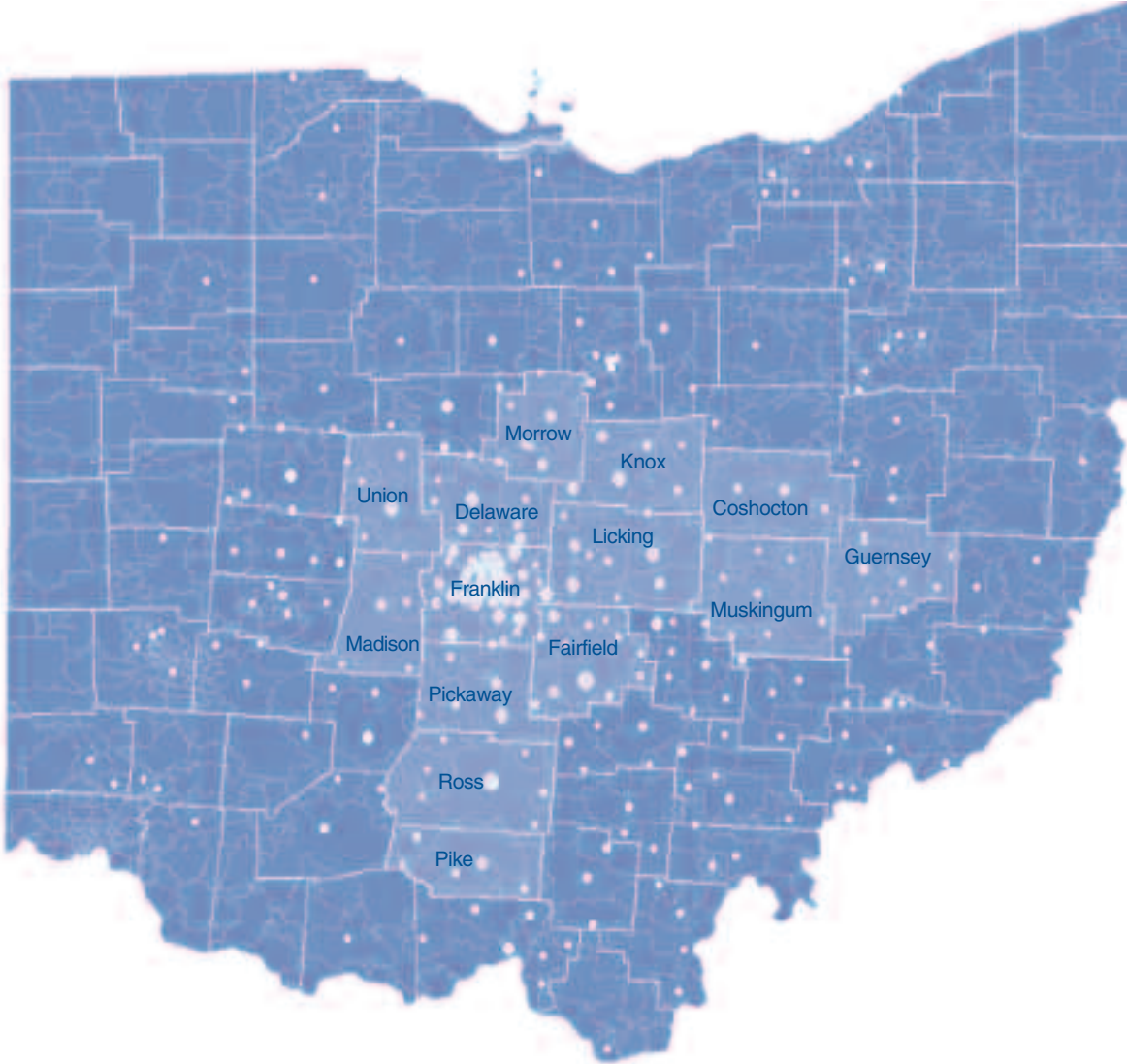


Figure 3.3: Number of Regional Motor Vehicle Crash Hospital Admissions, by Age (N=1,848), 2003 Regional COTS data.





Map 3.1: COTS Regional non-fatal MVT crash injury hospitalizations distribution, by zip code of residence, 2003 Regional COTS data.



Section 3: Regional COTS Registry Data: Non-Fatal MVT Hospitalizations

How Long

Regionally, the average hospital stay, for MVT crash victims, admitted to a COTS member hospital for two or more days was nearly 6.0 days in 2003 (Table 3.1). Among MVT crash hospitalizations, pedal cyclist related hospitalizations had the longest length of stay, lasting nearly 7 days on average.

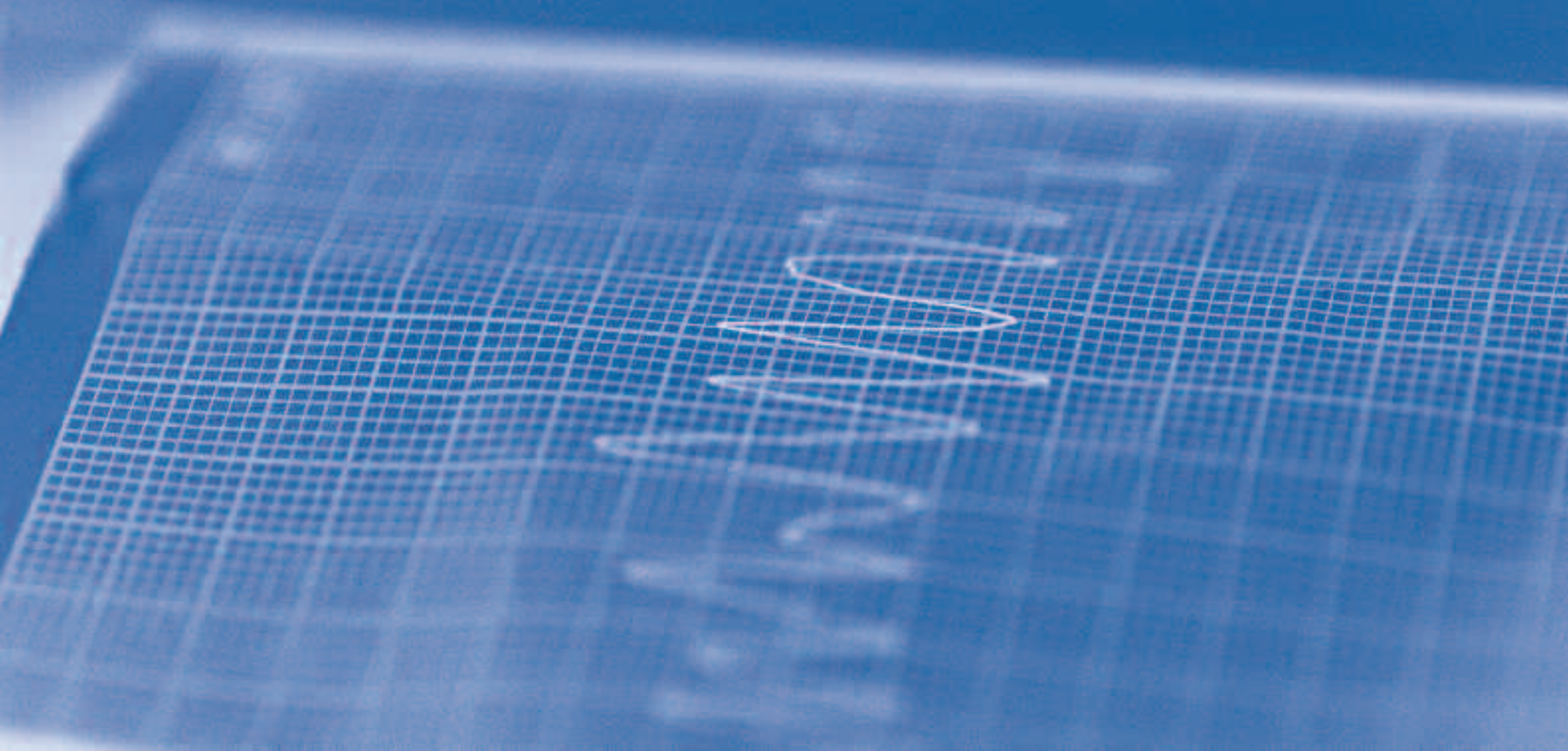
Person Involved	Mean length of stay (days)	
	2002	2003
Pedestrian	5.7	5.9
Motorcyclist	6.9	6.1
Other	5.6	5.9
Occupant	6.3	5.8
Unspecified	7.6	5.8
Pedal cyclist	10.7	6.6
All Unintentional MVT	6.3	5.9

Table 3.1: Regional, non-fatal, unintentional MVT injury crash hospitalization average length of hospital stay, by person involved, 2002 and 2003 Regional COTS data.



Section: 4

Summary of Regional Assault Injury Hospitalizations



Section 4: Regional COTS Registry Data: Non-Fatal Assault Hospitalizations

Introduction

Assaults resulting in two or more days of hospitalization make up approximately 8.5% of all regional COTS injury hospitalizations of two or more days.

What – Mechanism of Injury

Among regional assault hospitalizations, nearly one out of every three is due to firearms or explosives (Figure 4.1, Table 4.1). A majority (53%) of firearm assaults were from a handgun. Additionally, one in five assault hospitalizations were from fights or brawls.

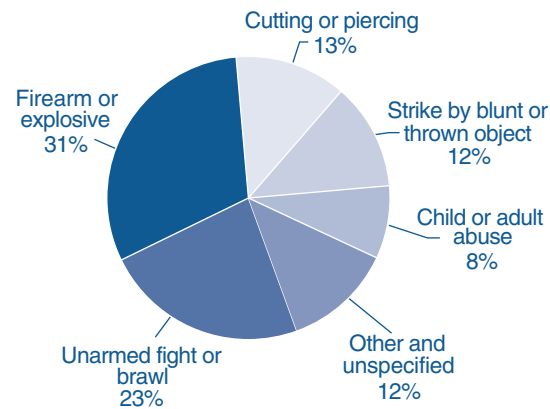


Figure 4.1: Regional leading mechanisms of assault injury hospitalizations (N=514), 2003 Regional COTS data.

Mechanism	Number	Percent of Total
Unarmed Fight, Brawl, Other	120	23.3%
Unarmed fight or brawl	116	22.6%
Other	3	0.58%
Firearm or Explosive	159	30.9%
Handgun	84	16.3%
Shotgun	12	2.33%
Other and unspecified firearm	61	11.9%
Anti-personnel bomb	1	0.19%
Unspecified explosive	1	0.19%
Cutting or Piercing Instrument	65	12.6%
Strike by blunt or thrown object	63	12.3%
Child or Adult Abuse	43	8.37%
by Father, stepfather, boyfriend	1	0.19%
by Mother, stepmother, girlfriend	1	0.19%
by Spouse or Partner	11	2.14%
by Child	2	0.39%
by Sibling	1	0.19%
By Non-related caregiver	2	0.39%
By Unspecified person	25	4.86%
Other and Unspecified	62	12.1%
Fire	2	0.39%
Air gun	1	0.19%
Human bite	5	0.97%
Other specified	16	3.11%

*Aggregating numbers by mechanism may not add up to total average (514) due to missing information.

Table 4.1: Regional assault hospitalizations by mechanism, 2003 Regional COTS data.



Attribute	All Assaults	Unarmed Fight or Brawl	Firearm or Explosive	Cutting or piercing Instrument	Strike by blunt or Thrown Object	Child adult abuse	Other or Unspecified
Total Number	514	120	159	65	63	43	62
Gender	Number & Percent of Category						
Males	434 (84.4%)	98 (81.7%)	147 (92.5%)	57 (87.7%)	55 (87.3%)	20 (46.5%)	7 (11.3%)
Females	80 (15.6%)	22 (18.3%)	12 (7.5%)	8 (12.3%)	8 (12.7%)	23 (53.5%)	55 (88.7%)
Age-Groups	Number & Percent of Category						
0-4	25 (4.9%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	24 (55.8%)	0 (0.0%)
5-9	2 (0.4%)	1 (0.8%)	0 (0.0%)	0 (0.0%)	1 (1.6%)	0 (0.0%)	0 (0.0%)
10-14	3 (0.6%)	2 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (2.3%)	0 (0.0%)
15-19	75 (14.6%)	8 (6.7%)	42 (26.6%)	8 (12.3%)	9 (14.3%)	2 (4.7%)	6 (9.7%)
20-24	90 (17.5%)	20 (16.7%)	36 (22.8%)	15 (23.1%)	9 (14.3%)	2 (4.7%)	8 (12.9%)
25-29	76 (14.8%)	17 (14.2%)	31 (19.6%)	6 (9.2%)	7 (11.1%)	3 (7%)	11 (17.7%)
30-34	59 (11.5%)	13 (10.8%)	17 (10.8%)	14 (21.5%)	7 (11.1%)	4 (9.3%)	4 (6.5%)
35-39	46 (9%)	13 (10.8%)	3 (1.9%)	10 (15.4%)	7 (11.1%)	2 (4.7%)	11 (17.7%)
40-44	57 (11.1%)	19 (15.8%)	11 (7%)	4 (6.2%)	12 (19%)	0 (0.0%)	11 (17.7%)
45-49	40 (7.8%)	16 (13.3%)	6 (3.8%)	3 (4.6%)	7 (11.1%)	1 (2.3%)	7 (11.3%)
50-54	17 (3.3%)	3 (2.5%)	8 (5.1%)	4 (6.2%)	1 (1.6%)	0 (0.0%)	1 (1.6%)
55-59	8 (1.6%)	3 (2.5%)	2 (1.3%)	0 (0.0%)	0 (0.0%)	1 (2.3%)	2 (3.2%)
60-64	5 (1%)	2 (1.7%)	2 (1.3%)	0 (0.0%)	0 (0.0%)	1 (2.3%)	0 (0.0%)
65-69	6 (1.2%)	2 (1.7%)	0 (0.0%)	0 (0.0%)	2 (3.2%)	0 (0.0%)	1 (1.6%)
70-74	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
75-79	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
80-84	4 (0.8%)	0 (0.0%)	0 (0.0%)	1 (1.5%)	1 (1.6%)	2 (4.7%)	0 (0.0%)
85+	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Missing age	—	—	1 (.06%)	—	—	—	—

Table 4.2: Number and percentage of regional, non-fatal assault injury hospitalizations in the past year by mechanism, gender, and age-group (2003 Regional COTS data).

Who

Among all regional assault hospitalizations for two or more days, greater than four out of every five are males (Table 4.2). Looking at specific types of assault hospitalizations, Firearm assaults account for the largest disparity between male and female (92.5% vs. 7.5%) assault hospitalizations. Firearm assaults also account for the largest overall number and percentage of all male assault hospitalizations (34%, 147 out of 434), followed by fights or brawls (23%, 98 out of 434). Looking at female assault hospitalizations, greater than half of the total assault hospitalizations were due to either child or adult abuse (29%, 23 out of 80) and fights or brawls (28%, 22 out of 80).

Among females, the leading cause of non-fatal assault hospitalizations in the COTS region as a whole is largely “unspecified.” (In Franklin County, the leading cause for female assault hospitalizations is domestic violence; see page 15 of this report.) Nationally a large percent of female assault victims are due to domestic violence, accounting for nearly 73,000 hospitalizations annually¹. The majority of women who are abused (up to 92%) do not reveal it to medical care providers.²

1 *Evaluating Domestic Violence Programs*, September 2002. Agency for Healthcare Research and Quality, Rockville, MD: <http://www.ahrq.gov/research/domesticviol/>.

2 *The Health Care Response to Domestic Violence Fact Sheet*, Family Violence Prevention Fund & Trauma Foundation, 1994. San Francisco, CA: <http://eserver.org/feminism/domestic-violence.html>.



Section 4: Regional COTS Registry Data: Non-Fatal Assault Hospitalizations

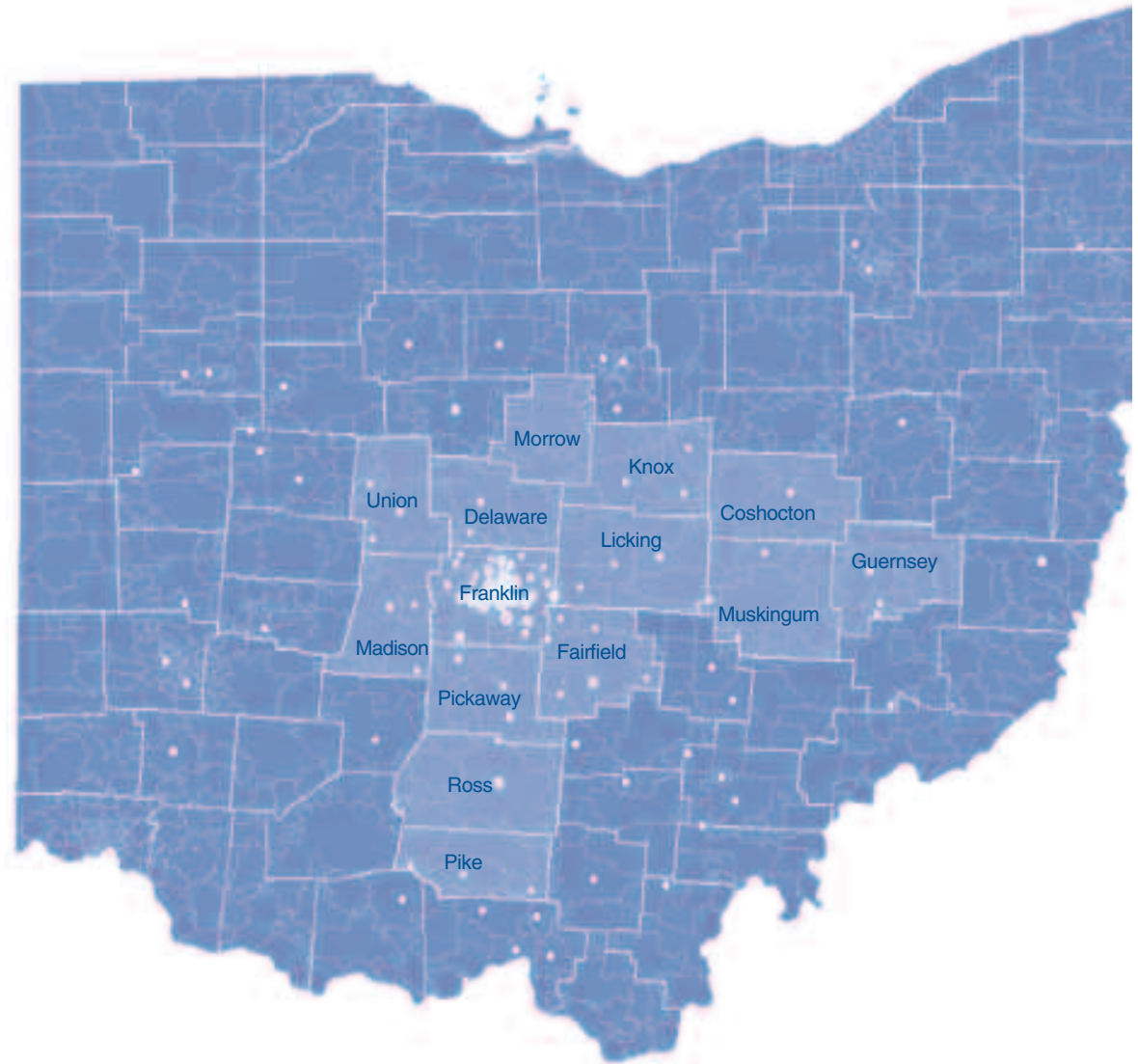
Among all regional assault hospitalizations, almost one out of every three is between the ages of 15-24 years. This same 15-24 year age-group accounts for almost 50% of all assault firearm hospitalizations.

Similar to the geographic distribution of MVT crash hospital admissions of two or more days to a COTS member hospital, the concentration of assault hospitalizations is highest among residents in and around the Franklin County area (Map 4.1).

Number of Cases

- 1 –2
- 3 –7
- 8 –13
- 14 –20
- 21 –30

- Counties with COTS Member Hospitals
- Ohio County Boundaries
- Ohio Zip Code Boundaries



Map 4.1: COTS Regional assault injury hospitalizations distribution, by zip code of residence, 2003 Regional COTS data.

5

Section: 5

Summary of All Mechanisms of Injury Hospitalizations

Section 5: Regional COTS Registry Data: Non-Fatal Hospitalizations

Introduction

In 2003, 5,984 people were admitted to a central Ohio hospital with a non-fatal injury severe enough to require two or more days of hospitalization. This is equal to 16 hospitalizations a day for the year. The number of injury admissions for two or more days to a COTS member hospital in 2003 is a 17% increase over the number in 2002 (5,984 vs. 5,123).

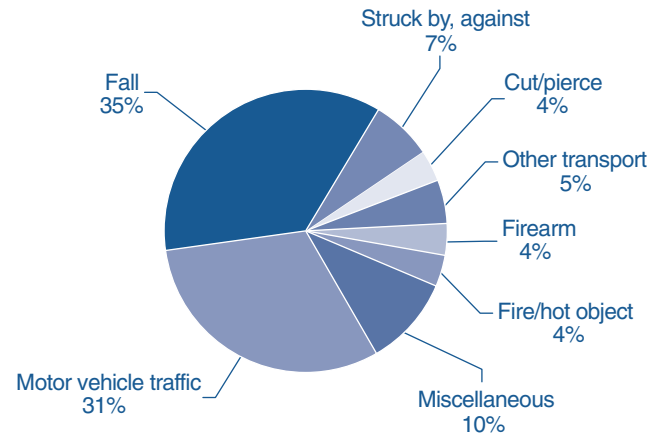


Figure 5.1: Leading Non-fatal injury hospitalization mechanisms (N=5,984), 2003 Regional COTS data.

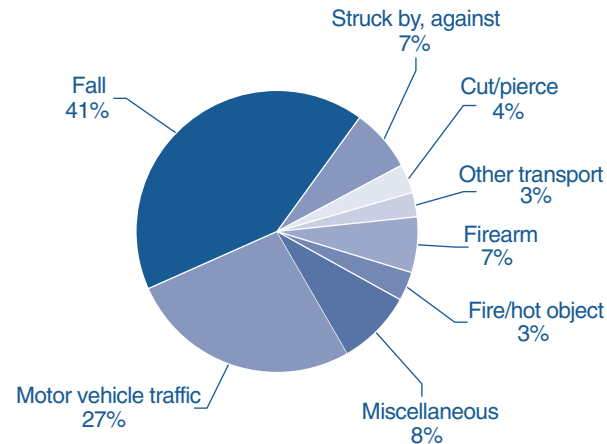


Figure 5.2: Franklin County resident leading non-fatal injury hospitalization mechanisms (N=2,532), 2003 COTS data.



Mechanism*	2002 Number	2002 Percent of Total	2003 Number	2003 Percent of Total
Fall	1808	35.3%	2147	35.9%
Motor Vehicle Traffic Crash	1541	30.1%	1853	31.0%
Struck by, against	374	7.3%	425	7.1%
Transport, other	257	5.0%	294	4.9%
Cut/pierce	196	3.8%	213	3.6%
Firearm	166	3.2%	221	3.7%
Fire/hot object	159	3.1%	211	3.5%
Other specified and classifiable	129	2.5%	152	2.5%
Unspecified	110	2.1%	66	1.1%
Machinery	100	2.0%	119	2.0%
Natural/environmental	77	1.5%	70	1.2%
Pedal cyclist, other (Non-MVT related)	74	1.4%	93	1.6%
Overexertion	42	0.8%	26	0.4%
Other specified, not elsewhere classifiable	33	0.6%	49	0.8%
Drowning/submersion	12	0.2%	15	0.3%
Pedestrian, other (Non-MVT related)	12	0.2%	15	0.3%
Suffocation	7	0.1%	13	0.2%
Poisoning	3	0.1%	1	0.02%
Adverse effects	8	0.2%	0	0%
Total	5124**		5984***	

* See Appendices for ICD-9 E-codes and definitions.

** 2002 Data—Aggregating numbers by mechanism may not add up to total (5,124). One case was missing an E-code; 2 cases were given a code of E849—place of injury code; and 13 were not given a fourth digit in the E-code, therefore we were unable to assign the exact mechanism of injury.

*** 2003 Data—Aggregating numbers by mechanism may not add up to total (5,984). One case was not given a fourth digit in the E-code, therefore we were unable to assign the exact mechanism of injury.

Table 5.1: Non-fatal injury hospitalizations per year, by mechanism, 2003 Regional COTS data.

What – Mechanism of Injury

The top three mechanisms of non-fatal injuries—falls, motor vehicle traffic (MVT) crashes, and struck-by or against an object or person—accounted for 74% (4,452 of 5,984) of the total number of injuries requiring two or more days of hospitalization in 2003 (Figure 5.1). Over one-third (35%) of all COTS injury hospitalizations were from falls, followed by MVT crashes (30%). A full list of injury hospitalization mechanisms including those comprising the miscellaneous category are presented in Table 5.1.



Section 5: Franklin County COTS Registry Data: Non-Fatal Hospitalizations

Introduction

In 2003, 2,532 Franklin County residents were admitted to a central Ohio hospital with a non-fatal injury severe enough to require two or more days of hospitalization, with an age-adjusted rate of approximately 255.0 per 100,000.

What – Mechanism of Injury

The top three mechanisms of non-fatal injury hospitalizations among Franklin County residents—falls, motor vehicle traffic crashes, and struck-by or against an object or person—accounted for 75% (1,911 of 2,532) of the total number of injuries to a Franklin County resident requiring two or more days of hospitalization (Figure 5.2). A large percentage (~42%) of these injury hospitalizations are due to falls, followed by MVT crashes (~27%). A full list of injury hospitalization mechanisms including those comprising the miscellaneous category are presented in Table 5.2.

Mechanism*	2002 Number (%)	2002 Adjusted Rate (per 100,00)	2003 Number (%)	2003 Adjusted Rate (per 100,00)
Fall	971 (38.5)	107.136	1055 (41.7)	116.866
Motor vehicle traffic (MVT)	658 (26.1)	62.272	676 (26.7)	64.540
Struck by, against	198 (7.8)	18.311	180 (7.1)	16.510
Firearm	122 (4.8)	10.783	166 (6.6)	14.984
Cut/pierce	108 (4.3)	9.734	89 (3.5)	8.011
Fire/hot object	86 (3.4)	7.951	86 (3.4)	7.872
Transport, other	80 (3.2)	7.365	65 (2.6)	6.077
Unspecified	78 (3.1)	7.889	33 (1.3)	3.062
Other specified and classifiable	51 (2.0)	4.159	55 (2.2)	5.063
Pedal cyclist, other (Non-MVT related)	38 (1.5)	3.610	37 (1.5)	3.500
Natural/environmental	38 (1.5)	3.457	32 (1.3)	2.949
Overexertion	27 (1.1)	2.574	12 (0.47)	1.244
Machinery	20 (0.79)	1.944	15 (0.59)	1.334
Other specified, not elsewhere classifiable	19 (0.75)	1.728	17 (0.67)	1.634
Drowning/submersion	8 (0.32)	0.714	3 (0.12)	0.265
Pedestrian, other (Non-MVT related)	7 (0.28)	0.705	4 (0.16)	0.385
Suffocation	4 (0.16)	0.358	6 (0.24)	0.559
Poisoning	2 (0.08)	0.147	1 (0.04)	0.099
Adverse effects	6 (0.24)	0.641	0 (0)	0
Total	2523**	251.537	2532	254.952

* See Appendices for ICD-9 E-codes and definitions.

** 2002 Data—Aggregating numbers by mechanism may not add up to total (2,523). In the entire 2002 registry, one case was missing an E-code; 2 cases were given a code of E849—place of injury code; and 13 were not given a fourth digit in the E-code, therefore we were unable to assign the exact mechanism of injury.

Table 5.2: Non-fatal injury hospitalizations per year, by mechanism, 2003 Regional COTS data.



6

Section: 6

Summary of Franklin County Resident All Mechanisms of Injury Mortality

Section 6: Franklin County Injury Mortality Data: All Mechanisms Summary

Overview

In 2001 and 2002, an average 512 of Franklin County residents sustained an injury severe enough to cause death (492* excluding adverse effects), an adjusted rate of 48.3 per 100,000. In Franklin County, unintentional injuries rank as the 7th leading cause of death while suicide is 12th and homicide is 14th (Table 6.1). In terms of years of productive life lost (YPLL), unintentional injuries rank 2nd, while suicide and homicide rank 5th and 6th respectively (Table 6.2). As a whole, all injury deaths (unintentional, homicide, and suicide) are responsible for a total average of 11,093.5 years of productive life lost, making all injury deaths the number one cause of years of productive life lost. In 2000 and 2001 the average number of injury fatalities in Franklin County was 449. There were an average of 63 more fatalities in 2001-2002 compared to 2000-2001, a 14% increase.

* In 2001-02 there were an average of 11 Adverse Effects of drugs or medical care, 8 Undetermined intent, and 1 case with not enough information to categorize.

Rank	Cause	Average Number
1	Diseases of the Heart	2060.5
2	Malignant Neoplasm	1904
3	Cerebrovascular Disease	514
4	Chronic lower respiratory disease	465
5	Diabetes mellitus	316
6	Unintentional Injuries	302.5
7	Influenza and Pneumonia	184
8	Alzheimer's Disease	178
9	Nephritis, nephritic syndrome and nephrosis	152.5
10	Septicemia	119.5
11	Suicide	107.5
12	Chronic liver disease and cirrhosis	85
13	Homicide	82
14	Essential primary hypertension and hypertensive renal disease	78.5
15	Certain conditions originating in the perinatal period	71.5
16	Parkinson's Disease	58
17	Aortic aneurysm and dissection	51.5
18	Congenital malformations, deformations and chromosomal abnormalities	46
19	Pneumonitis due to solids and liquids	44
20	HIV/AIDS	43

Table 6.1: Top 20 Franklin County leading causes of death (Average Number of Deaths per year = 8,130.5), 2001-02.

Rank	Cause	Average YPLL
1	Malignant Neoplasm	7387.5
2	Unintentional Injuries	6011.5
3	Diseases of the Heart	5400
4	Certain conditions originating in the perinatal period	4640
5	Homicide	2698.5
6	Suicide	2383.5
7	Congenital malformations, deformations and chromosomal abnormalities	2208.5
8	Diabetes mellitus	1202.5
9	Cerebrovascular Disease	1086.5
10	HIV disease	1008

Table 6.2: Top 10 Franklin County leading causes of years of productive life lost (YPLL), 2001-02.



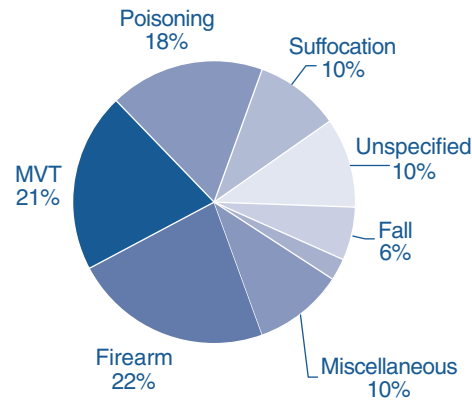


Figure 6.1: Franklin County leading mechanisms of injury death (average N=512), 2001-02 mortality data.

What – Mechanism of Injury

The top three mechanisms of injury death—firearm, motor vehicle traffic crash, and poisoning—accounted for over 61% of the total number of injury deaths to Franklin County residents in 2001 and 2002 (Figure 6.1). A full list of injury mechanisms of death including those comprising the miscellaneous category are presented in Table 6.3 (see next page).

Injury by intent

Approximately 60% of all injury deaths are unintentional, while approximately 17% are due to homicides and 22% are suicides (Figure 6.2).

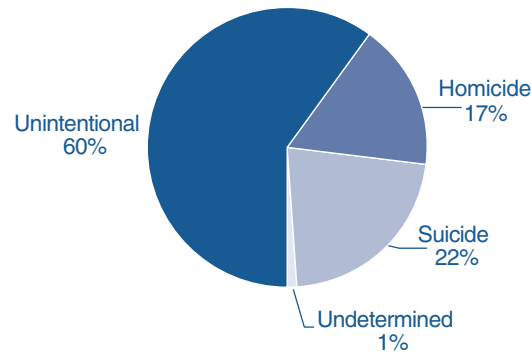


Figure 6.2: Franklin County injury deaths by intent (N=500), 2001-02 mortality data.



Section 6: Franklin County Injury Mortality Data: All Mechanisms Summary

Mechanism*	Average Number	Percent of Total	Adjusted Rate (per 100,00)
Firearm	116	22.65625	10.509
Motor Vehicle Traffic (MVT)	106	20.70313	9.706
Poisoning	90.5	17.67578	8.244
Unspecified	53	10.35156	6.159
Suffocation	50	9.765625	5.029
Fall	31.5	6.152344	3.453
Fire/Hot object	13	2.539063	1.276
Cut/pierce	12	2.34375	1.110
Adverse effects	11	2.148438	1.249
Drowning	8.0	1.5625	0.747
Other specified, not elsewhere classifiable	8.0	1.5625	0.822
Other specified, classifiable	4.5	0.878906	0.406
Natural/environmental	2.0	0.390625	0.216
Other pedestrian, (Non-MVT)	1.5	0.292969	0.141
Other land transport	1.5	0.292969	0.144
Machinery	0.5	0.097656	0.052
Other pedal cyclist	0.5	0.097656	0.048
Other transport	0.5	0.097656	0.042
Struck by or against	0.5	0.097656	0.059
Total	512**	100%	49.542

* See Appendices for ICD-10 codes and definitions

** Aggregating numbers by mechanism may not add up to total average (512) due to missing information.

Table 6.3: Franklin County average injury deaths, percentage of total, and age-adjusted death rate by mechanism, 2001-2002.



Appendices

A

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 in averaged 2001-2002 format. Franklin County residency is determined by residency county codes recorded on the death certificates in 2000 and geo-coding from 2001 and beyond.

Non-fatal Injuries (Injury Hospitalizations): The data relating to non-fatal injuries, from 2002 and 2003 is from the Central Ohio Trauma System and its member hospitals.

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. Motor Vehicle Traffic Crash related-TBI patients also have 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. 2003 Franklin County, OH Trauma Hospitalization Rates: 2003 U.S. Census Bureau American Community Survey Estimate for Franklin County, OH.
2. 2003 Franklin County, OH Smoothed Zip Code Age-Adjusted Trauma Hospitalization Rates: 2000 U.S. Census Bureau Zip Code Tabulation Area population estimates.
3. 2003 Franklin County, OH Trauma hospitalization Age-specific and gender Age-specific rates: 2003 Linear estimates derived from 1990 and 2000 age-specific and gender age-specific populations.
4. 2002 Franklin County, OH Mechanism of Injury Death Rates: 2002 U.S. Census Bureau American Community Survey Estimates for Franklin County, OH.
5. 2001-2002 Average Franklin County, OH Death Rates by Cause: 2001 and 2002 U.S. Census Bureau Annual Time Series Estimate for Franklin County, OH.
6. 2001-2002 Average Franklin, OH County Zip Code Age-Adjusted Death Rates: 2000 U.S. Census Bureau Zip Code Tabulation Area population estimates.



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.

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 age-specific and age-adjusted.

Age-specific Rate

2002 Franklin County hospital admission age-specific rates for trauma and 200-2001 average Franklin County injury death age-specific rates are calculated by dividing the appropriate aggregated number of years 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:

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

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

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 i th age class of area a is

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

then DSR_a equals:

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

DSR_a = directly standardized rate for area a

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

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

x_{ia} = number of cases in i th 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 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.

Smoothed Zip Code Average Age-Adjusted Rates and Maps

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.

Comparing Rates

There are several ways to compare rates with one another. One method is to calculate the 95% CIs for the rates being compared and determine if the CIs overlap with one another. If the CIs do not overlap, then the two rates are considered to be significantly different at the 95% confidence level. For example, the table below shows 1990-1998 average firearm mortality rates for males and female in Franklin County.

Example:

Gender	Average Deaths	Crude Rate	95%CI
Male	119.3	24.81	20.26-29.35
Female	23.2	4.49	2.62-6.35

In the above example, the male CI does not overlap the female CI. Therefore, we can say (with 95% confidence) that there is a significant difference between the male and female firearm mortality rate in Franklin County. Again, crude rates should never be compared to age-adjusted rates.



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)

- Includes legal intervention (E970-E978) and operations of war (E990-E999).
- Three 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.
- E968.5 (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.
- E849 (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.

Mechanism/Cause	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-.9 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	E890.0-E899	E958.1	E968.0, E979.3	E988.1	
Hot object/substance	E924.0-9	E958.2,.7	E961, E968.3	E988.2,.7	
Firearm	E922.0-.3,.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 (.0.1)				
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	E800-807(.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 ³	E905.0-6, 9 E906.0-4, 5, 9				
Overexertion	E927				
Poisoning	E850.0-E869.9	E950.0-E952.9	E962.0-9	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation	E911-E913.9	E953.0-9	E963	E983.0-9	
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	E968.9	E988.9	E976; E997.9
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



Mechanism/Cause	Manner/Intent Unintentional	Suicide	Homicide	Undetermined	Other
Cut/pierce	W25-W29, W45	X78	X99	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/flame	X00-X09	X76	X97	Y26	
Hot object/substance	X10-X19	X77	X98	Y27	
Firearm	W32-W34	X72-X74	X93-X95, *U01.4	Y22-Y24	Y35.0
Machinery	W24, W30-W31				
All Transport	V01-V99	X82	Y03, *U01.1	Y32	Y36.1
Motor vehicle traffic					
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)

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

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 "*" .





04

www.goodhealthcolumbus.org

431 E. Broad Street
Columbus, Ohio 43215

T: 614.40.7419

F: 614.240.7416



Central Ohio
Trauma System