

Injuries to Massachusetts Residents

Data to Support the Unintentional Injury Prevention Strategic Plan

Beth Hume, Project Director
Jeanne Hathaway, Epidemiologist

Injury Surveillance Program, MDPH

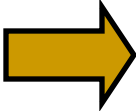


General Overview




Leading Causes of Death

MA Residents, 2008



Rank	<1 year	1-14 years	15-24 years	25-44 years	45-64 years	65-74 years	75-84 years	85+ years	All Ages
1	Short gestation and LBW (95)	Injury Deaths (32)	Injury Deaths (294)	Injury Deaths (761)	Cancer (3092)	Cancer (2933)	Cancer (4119)	Heart Disease (5946)	Cancer (12996)
2	Congenital malformations (58)	Cancer (28)	Cancer (24)	Cancer (289)	Heart Disease (1606)	Heart Disease (1485)	Heart Disease (3531)	Cancer (2508)	Heart Disease (12840)
3	Pregnancy Complications (28)	Congenital Malformation (11)	Heart Disease (18)	Heart Disease (244)	Injury Deaths (840)	Chronic Lower Respiratory Disease (497)	Chronic Lower Respiratory Disease (967)	Stroke (1298)	TOTAL INJURY DEATHS (2,820)
4	SIDS (24)	Influenza & Pneumonia (5)	Ill-defined conditions (15)	Ill-defined conditions (67)	Chronic liver disease (299)	Stroke (253)	Stroke (824)	Alzheimer's Disease (1228)	Stroke (2636)
5	Complications of placenta (21)	Ill-defined conditions (5)	Congenital Malformation (11)	Chronic liver disease (63)	Chronic Lower Respiratory Disease (238)	Diabetes (207)	Alzheimer's Disease (492)	Influenza & Pneumonia (908)	Chronic Lower Respiratory Disease (2565)
6	Intrauterine Hypoxia (10)	Heart Disease (4)	Stroke (5)	HIV/AIDS (38)	Stroke (224)	Nephritis (187)	Nephritis (453)	Chronic Lower Respiratory Disease (851)	Alzheimer's Disease (1829)
7	Respiratory distress (10)	Perinatal conditions (4)	Diabetes (3)	Diabetes (30)	Diabetes (219)	Injury Deaths (141)	Influenza & Pneumonia (416)	Nephritis (604)	Influenza & Pneumonia (1599)
8	Circulatory System (8)	Stroke (2)	--	--	Septicemia (117)	Influenza & Pneumonia (134)	Diabetes (332)	Injury Deaths (411)	Nephritis (1375)
9	Neonatal hemorrhage (7)	--	--	--	Ill-defined conditions (113)	Septicemia (133)	Injury Deaths (285)	Ill-defined conditions (318)	Diabetes (1084)
10	Pulmonary hemorrhage (5)	--	--	--	--	Chronic liver disease (111)	Septicemia (256)	Pneumonitis (299)	Septicemia (782)



Source: Registry of Vital Records and Statistics, MDPH

Intent of Injury, MA Residents

Fatal (2008) and Nonfatal Injuries (2009)

Intent of Injury	Injury Fatalities		Nonfatal Hospital Stays		Nonfatal EDVisits		Total Injuries	
	Number	Rate ¹	Number	Rate ¹	Number	Rate ¹	Number	Rate ¹
Unintentional	2,029	31.2	53,226	819.1	663,041	10,203.8	718,296	11,054.2
Suicide and Self-Inflicted	499	7.7	4,481	69.0	6,714	103.3	11,694	180.0
Homicide and Assault	166	2.6	2,487	38.3	24,935	383.7	27,588	424.6
Undetermined Intent	85	1.3	934	14.4	5,905	90.9	6,924	106.6
Other/Legal	7	0.1	52	0.8	621	9.6	680	10.5
Adverse effects	34	0.5	3,162	48.7	1,138	17.5	4,334	66.7
Intent Code Missing ²	0	0.0	5,132	79.0	6,883	105.9	12,015	184.9
Total	2,820	43.4	69,474	1,069.2	709,237	10,914.8	781,531	12,027.3

Sources: Registry of Vital Records and Statistics; MA Inpatient Hospital Discharge Database, and MA Outpatient Emer. Dept. Discharge Database, DHCFF

Unintentional Injury Deaths

Leading Causes, MA Residents, 2008

INJURY CAUSE	Total Number	Crude Rate	Percent
Poisoning	728	11.2	35.9
Fall	479	7.4	23.6
Transport Injuries	398	6.1	19.6
Suffocation/hanging	116	1.8	5.7
Firearm	0	0.0	0.0
Drowning/submersion	46	0.7	0.2
Cut/pierce	0	0.0	0.0
Fire/burn	39	0.6	0.2
Natural/environmental	17	0.3	0.1
Struck by, against	6	0.1	0.0
Machinery	5	0.1	0.0
Other specified	57	0.9	0.3
Unspecified	162	2.5	8.0
TOTAL DEATHS	2,029	31.2	100%

79%

Source: Registry of Vital Records and Statistics, MDPH

Nonfatal Unintentional Injury-related Hospital Discharges, FY2009

INJURY CAUSE	Total Number	Crude Rate per 100,000	Percent of Total
Fall	28,258	434.9	58.7
Poisoning	6,726	103.5	14.0
Transport Injuries	4,652	71.6	9.7
Struck by, against	1,305	20.1	2.7
Cut/pierce	559	8.6	1.2
Natural/environmental	1,170	18.0	2.4
Overexertion	911	14.0	1.9
Suffocation/hanging	607	9.3	1.3
Fire/burn	507	7.8	1.1
Firearms	31	0.5	0.1
Machinery	174	2.7	0.4
Drowning/submersion	34	0.5	0.1
Other specified	3,814	58.7	7.9
Unspecified	3,416	52.6	7.1
Adverse effects	<i>n/a</i>	--	<i>n/a</i>
Missing	<i>n/a</i>	--	<i>n/a</i>
TOTALS	48,144	740.9	100%

82%

Source: MA Inpatient Hospital Discharge Database, DHCFF

Nonfatal Unintentional Injury-related ED Visits, FY2009

INJURY CAUSE	Total Number	Crude Rate per 100,000	Percent of Total
Fall	193,407	2,976.4	27.5
Struck by, against	115,683	1,780.3	16.4
Transport Injuries	80,773	1,243.1	11.5
Overexertion	78,004	1,200.4	11.1
Cut/pierce	66,504	1,023.5	9.5
Natural/Environmental	29,765	458.1	4.2
Poisoning	13,716	211.1	2.0
Fire/burn	9,393	144.6	1.3
Machinery	3,194	49.2	0.5
Suffocation	578	8.9	0.1
Firearm	424	6.5	0.1
Drowning/submersion	141	2.2	0.0
Other specified	49,819	766.7	7.1
Unspecified	54,523	839.1	7.8
Adverse effects	1,376	21.2	0.2
Missing	5,997	92.3	0.9
TOTALS	703,297	10,823.3	100.0

Fall and Transport
39%

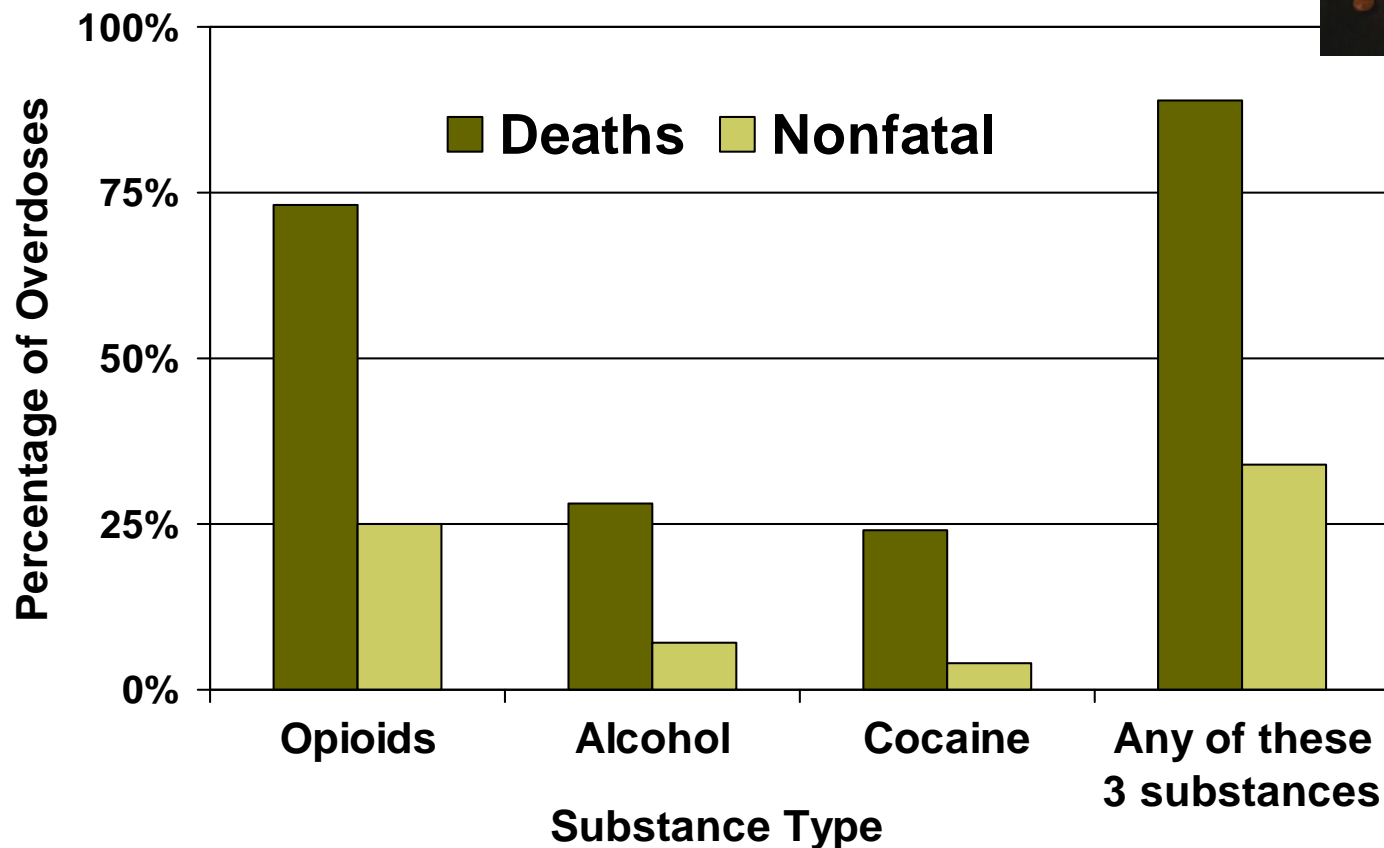
Source: MA Outpatient Emer. Dept. Discharge Database, DHCFFP

Unintentional Poisonings/ODs



Fatal and Nonfatal Overdoses¹

Main Substances Involved

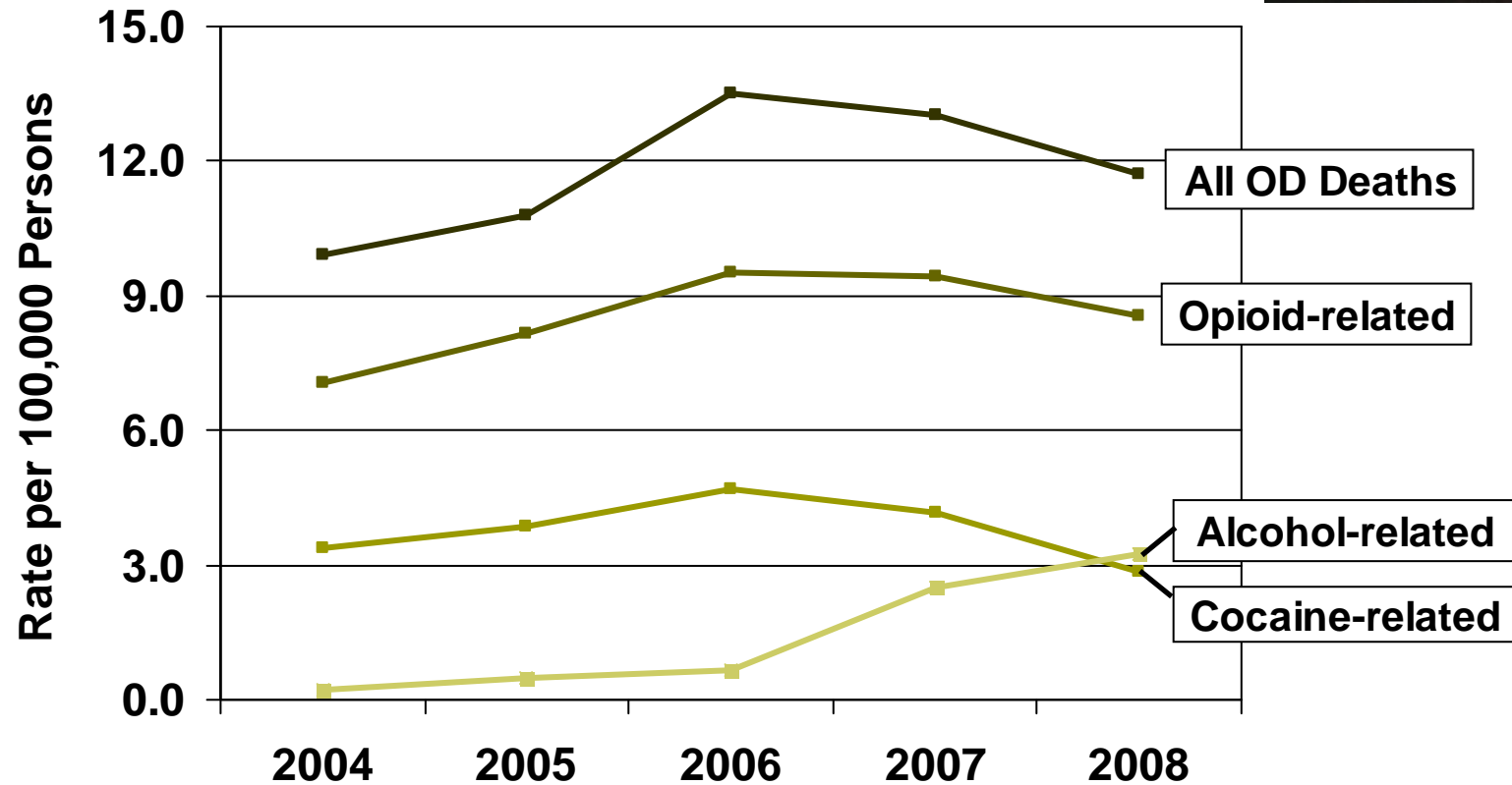


¹Unintentional or undetermined poisonings/ODs only.

Sources: Registry of Vital Statistics, 2008, MDPH and MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, FY2009, DHC FP

Fatal Overdoses¹

Trends by Main Substance Involved, 2004 - 2008



¹Unintentional or undetermined poisonings only.

Source: Registry of Vital Statistics, MDPH

Fatal Opioid-related ODs¹

By Age Group & Gender



¹Unintentional or undetermined intent only.

Sources: Registry of Vital Statistics, 2008, MDPH

Opioid-related Overdoses

Association with Rx's (Ohio Report)



- From 1999 to 2008, unintentional OD deaths increased by 350% in Ohio, with this increase mostly due Rx drug-related ODs.
- 75% of those who died from a Rx opioid-related OD had an opioid Rx within 2+ years before their death.
- Persons who died from drug ODs had opioid Rx “fill rates” 5-25x higher than the average person in Ohio.
- The most frequently filled opioid Rx's among drug OD decedents were hydrocodone & oxycodone.

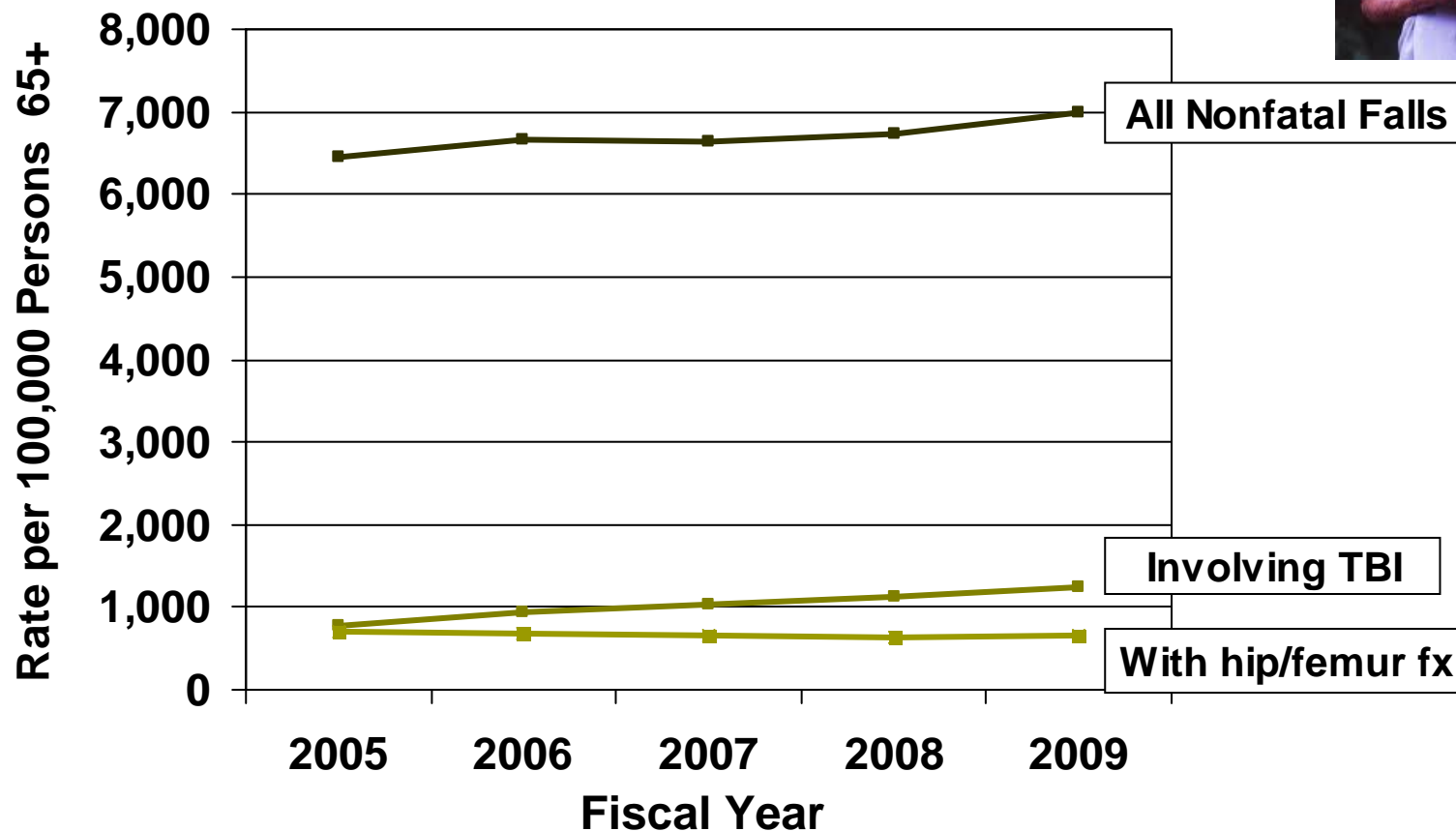
Source: The Burden of Poisoning in Ohio, 1999-2008, Ohio Department of Health, 2010

Falls Among Older Adults



Falls Among Older Adults¹

Nonfatal Fall Rates, 2005 - 2009

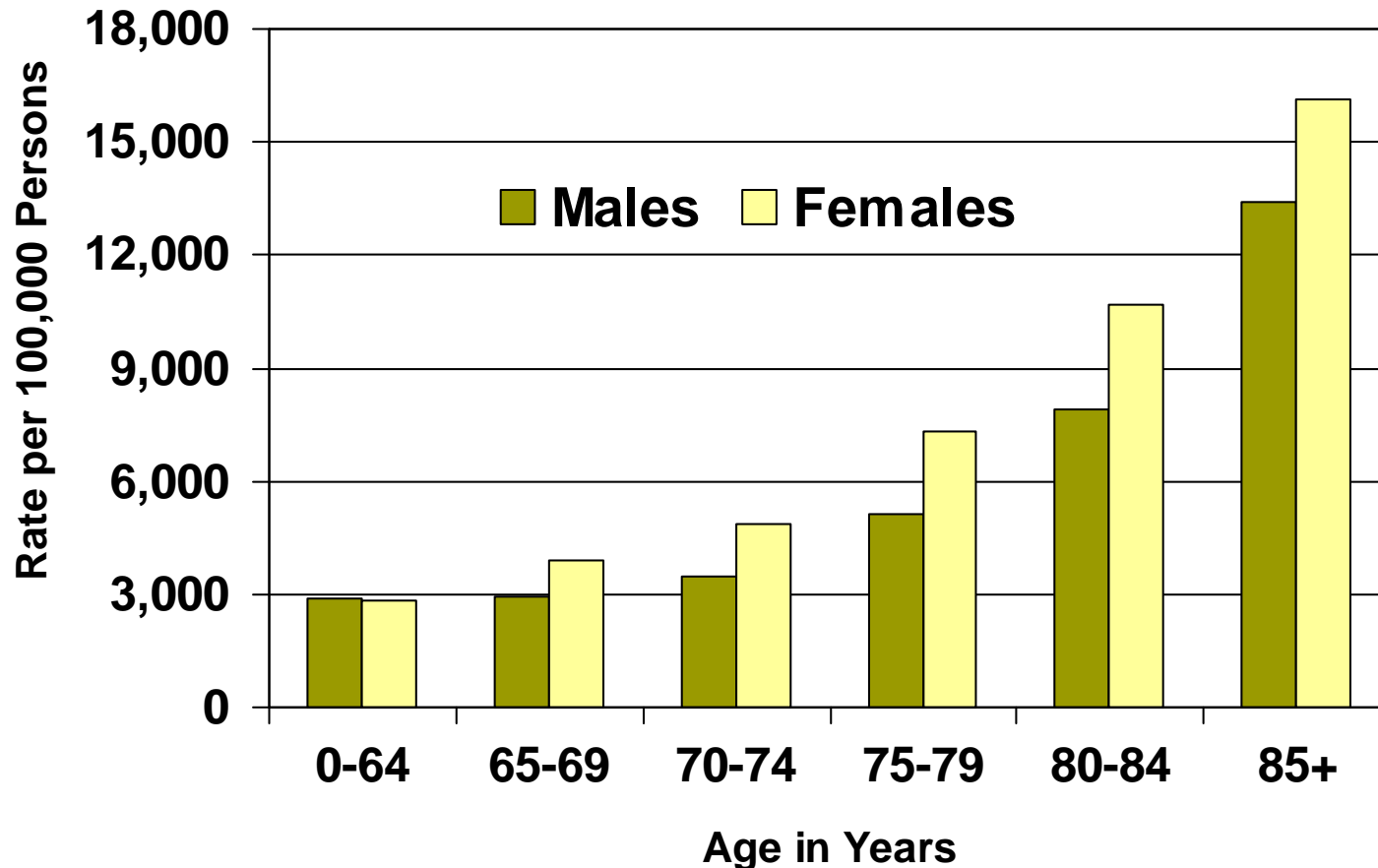


¹Unintentional falls among adults ages 65+.

Sources: MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, DHCFP

Falls Among Older Adults

Nonfatal Fall Rates by Age & Gender



Sources: MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, FY2009, DHCFP

Falls Among Older Adults

Associated Conditions (selected)



Of MA adults ages 65+ who reported...

- **(the following associated conditions),
over one in five...**

...also reported falling in the past 3 months.

Source: Behavioral Risk Factor Surveillance Survey, 2010, MDPH

Falls Among Older Adults

Associated Conditions (selected)



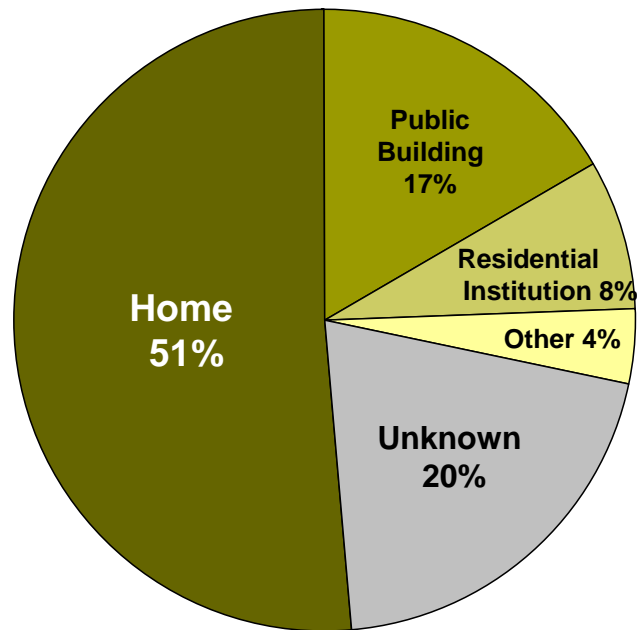
Of MA adults ages 65+ who reported...

- **poor mental health, one in three (36%) ...**
- **cognitive impairments, one in four (26%) ...**
- **any disability, one in four (23%) ...**
- **diabetes, one in five (21%) ...**
- **a prior heart attack, one in five (19%) ...**

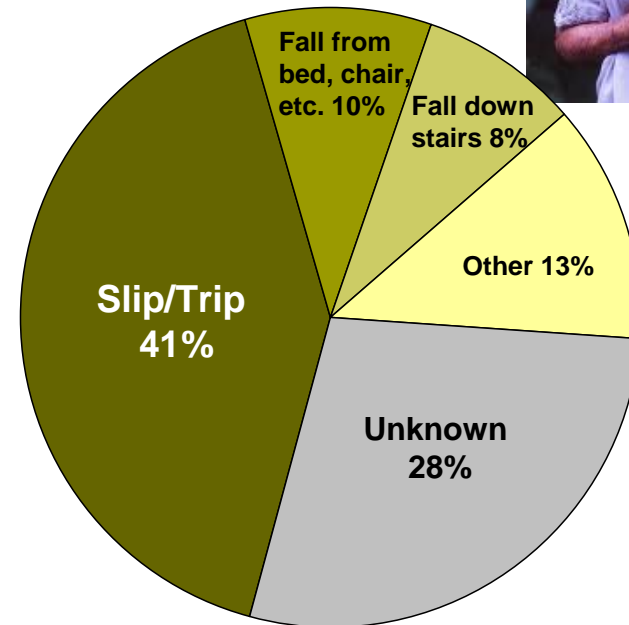
...also reported falling in the past 3 months.

Falls Among Older Adults

Location & Circumstances of Falls



**Location of Fatal Falls,
MA adults 65+, 2008**



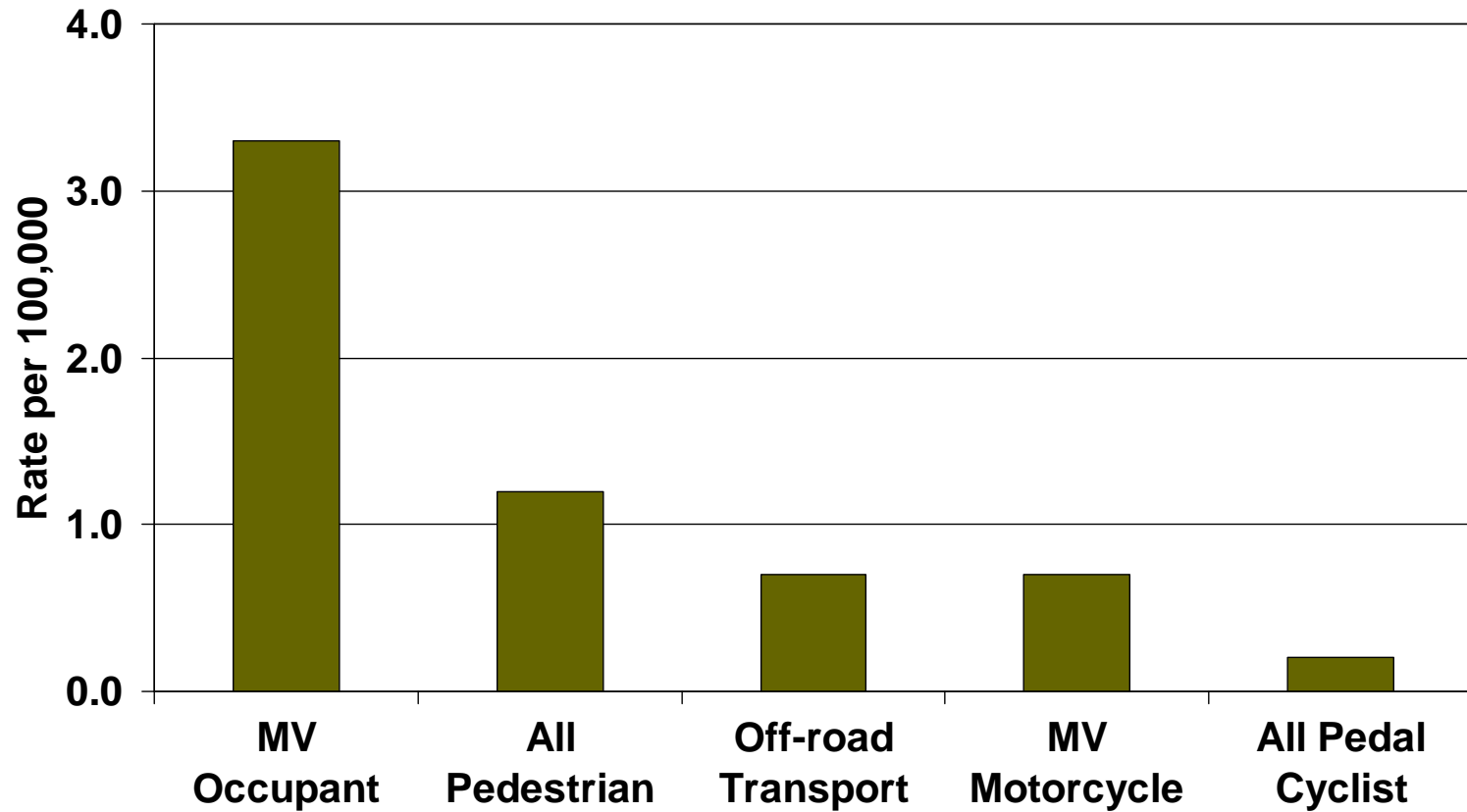
**Circumstances of Nonfatal Falls,
MA Adults 65+, 2009**

Sources: Registry of Vital Statistics, MDPH;
MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, DHCFP

Transportation-Related Injuries



Transportation-Related Deaths Rates by “Person Type”¹

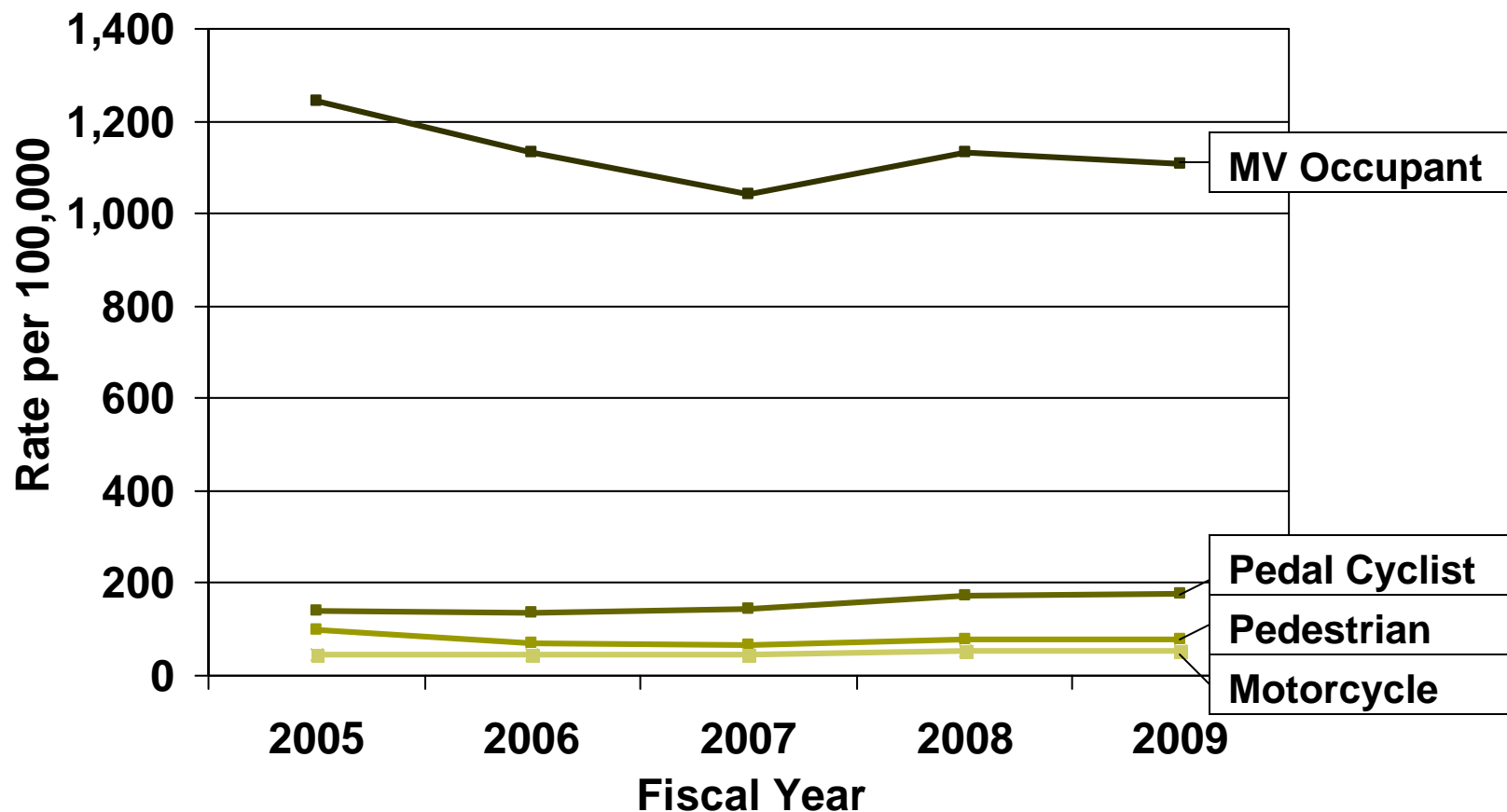


¹Pedestrian and pedal cyclist categories include MV and non-MV related injuries.

Sources: Registry of Vital Statistics, MDPH

Transportation-Related Injuries

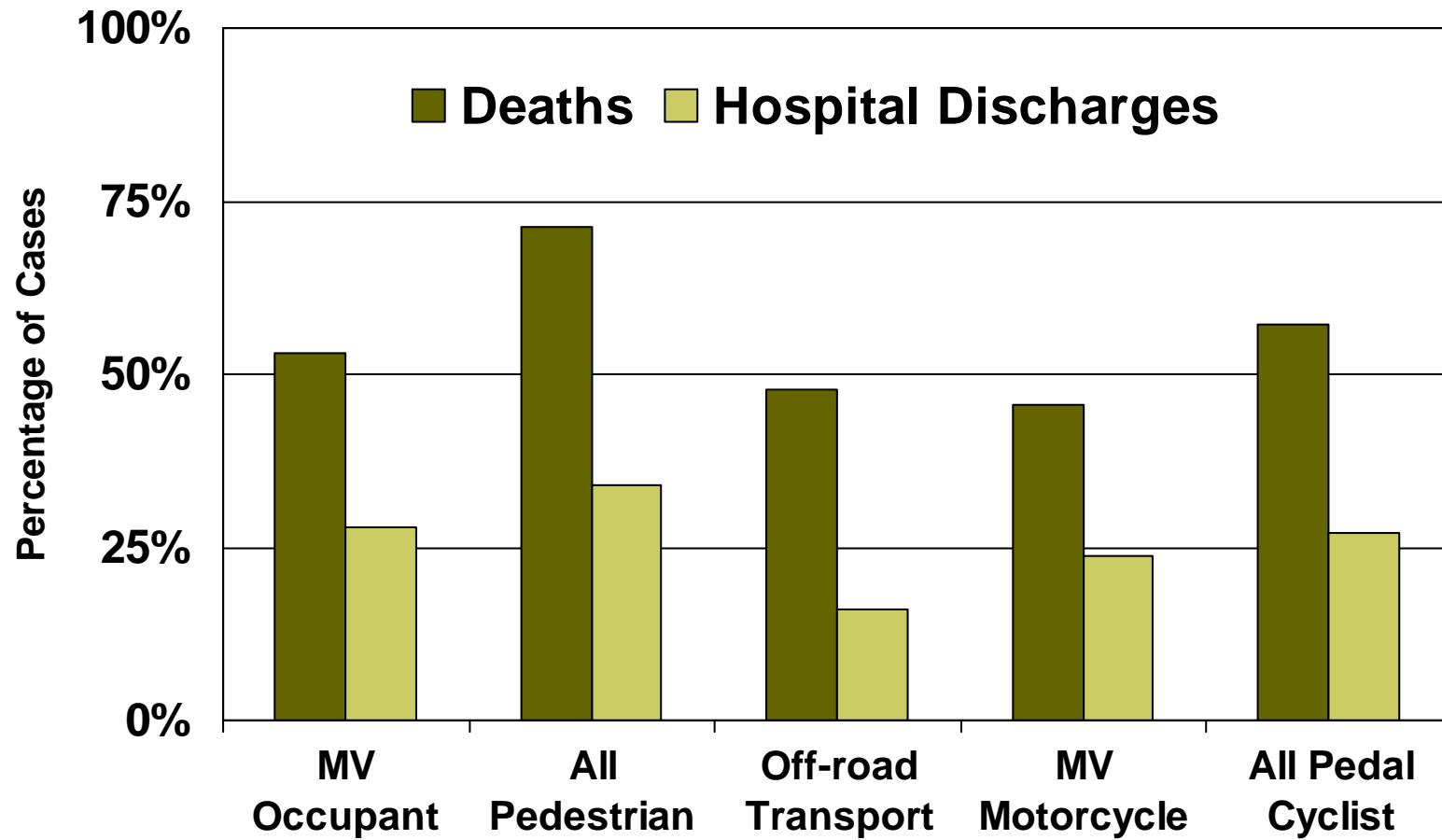
Trends in Nonfatal Injuries, 2005 - 2009



Sources: MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, DHCFP

Transportation-Related TBIs

Percent of Deaths & Hospital Discharges Involving TBI



Sources: Registry of Vital Statistics, 2008, MDPH
MA Inpatient Hospital Discharge Database, FY2009, DHCFP

Fatal Traffic Crashes¹

Major Risk Factors (NHTSA, 2009)



Of 334 traffic-related fatalities in MA:

- **60% were not using belts/restraints**
- **35% involved alcohol (BAC = .08+)**
- **23% involved speeding**
- **11% involved drivers under age 21**

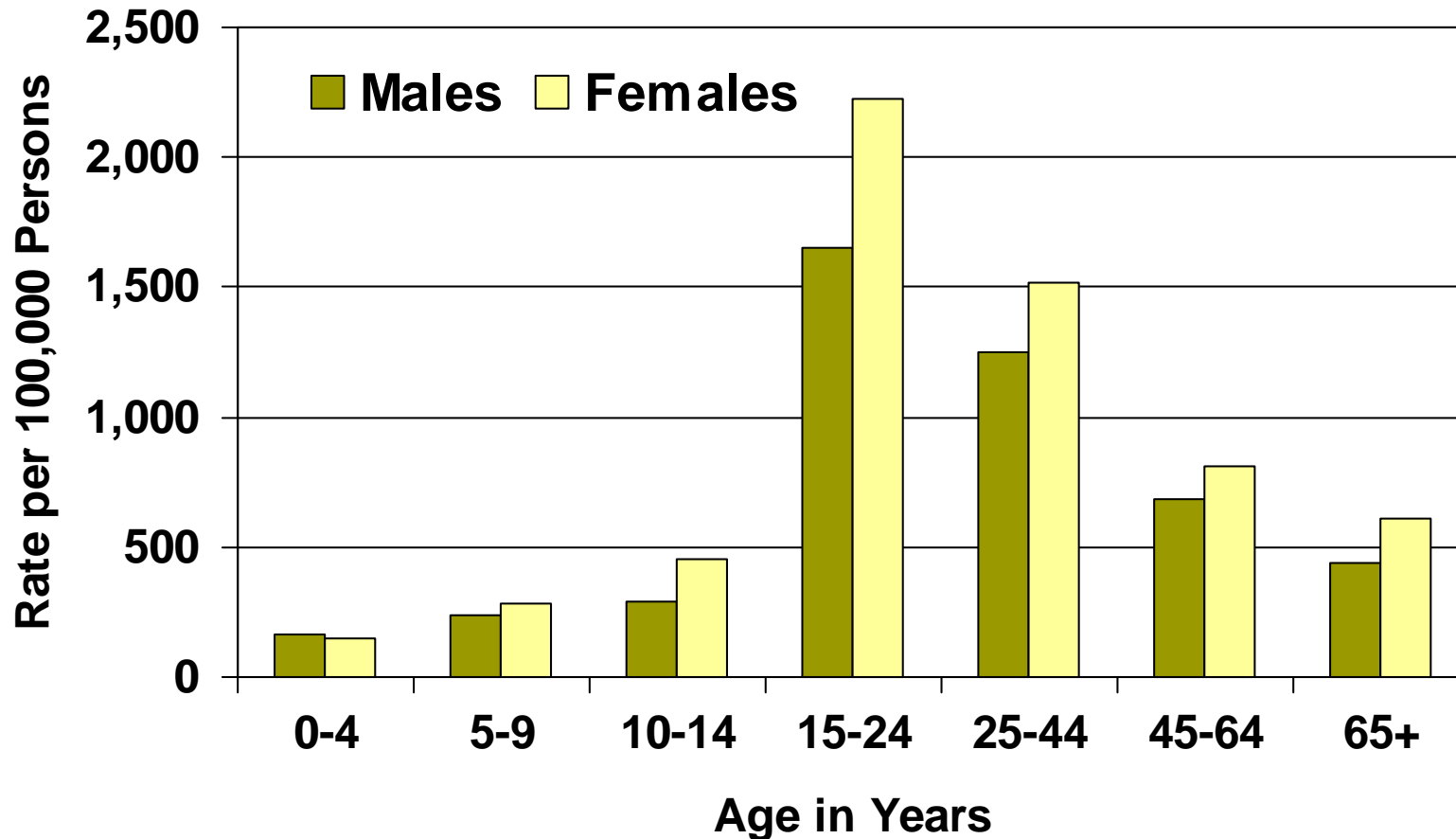
Source: ¹Traffic Safety Facts, Massachusetts, 2005-2009, NHTSA

MV Occupant Injuries



MV Occupant Injuries

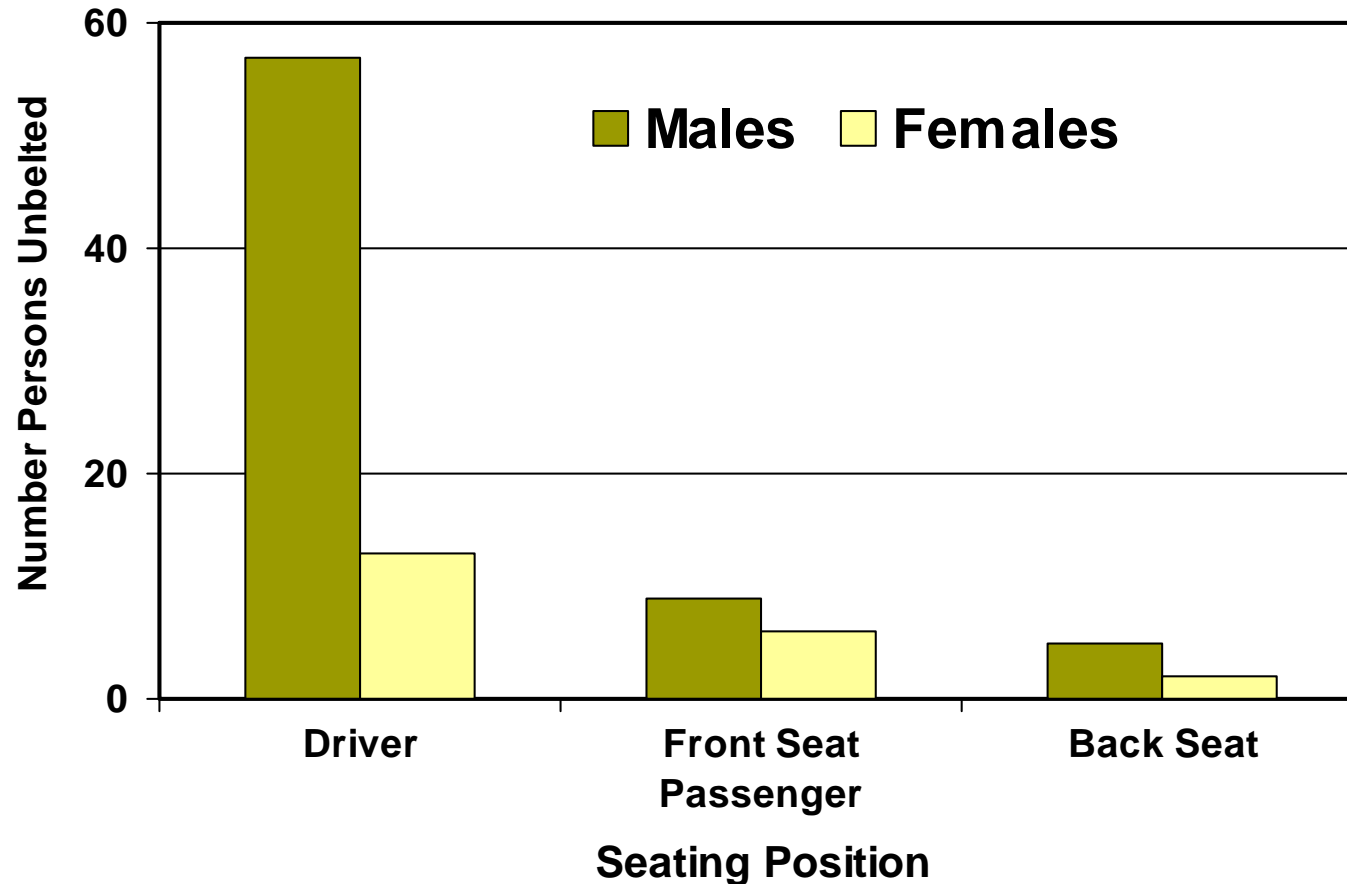
Nonfatal Injuries by Age Group & Gender



Sources: MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, FY2009, DHCFP

MV Occupant Deaths¹

Unbelted Persons by Seating Position & Gender



¹n = 99 unbelted persons (of 185 MV-occupant deaths in MA; n missing = 39)

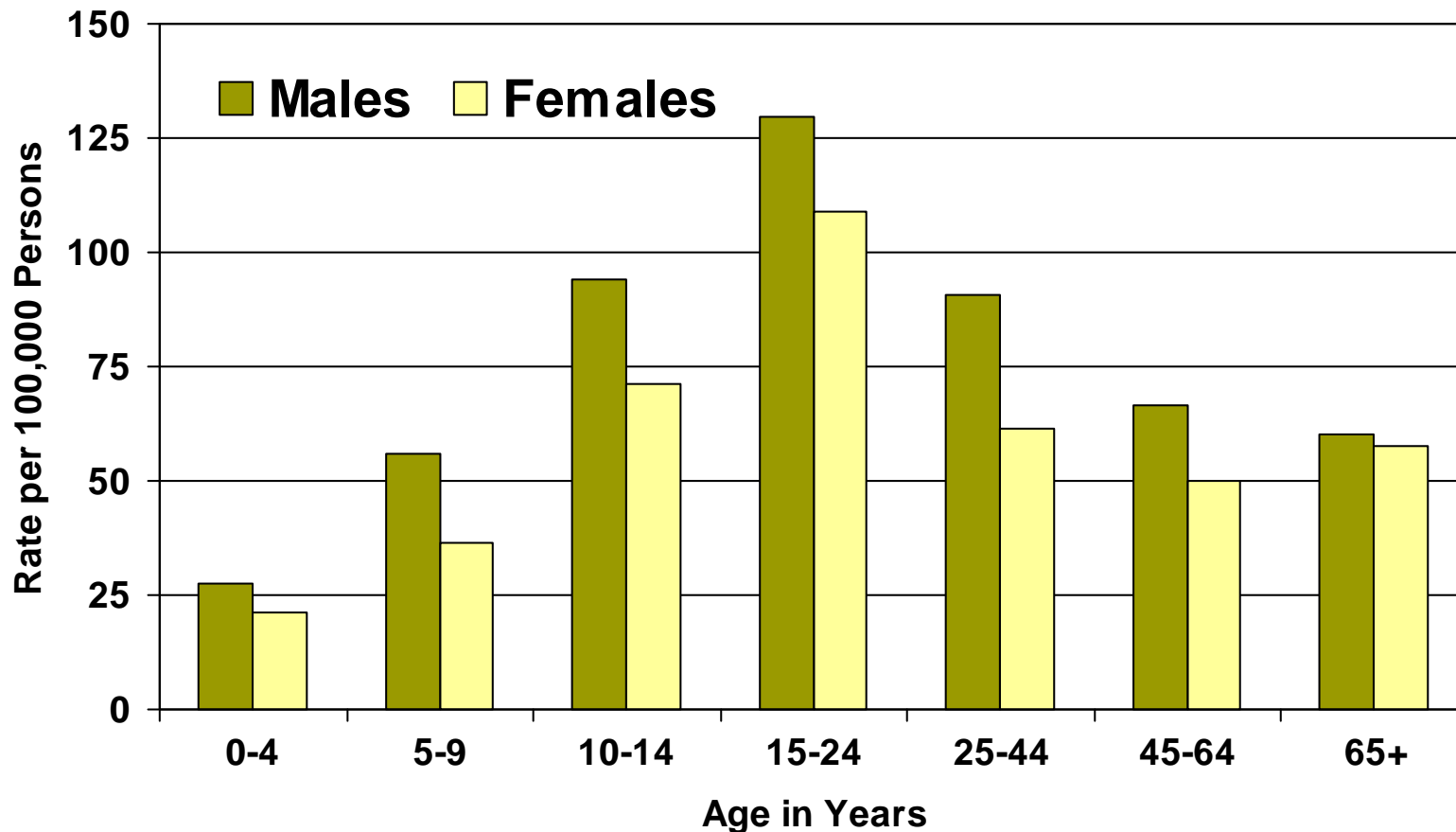
Sources: Fatality Analysis Reporting System (FARS) Query System, 2009, NHTSA

Pedestrian Injuries



Pedestrian Injuries¹

Nonfatal Injuries by Age Group & Gender



¹ Includes MV traffic-related and non-MV traffic

Sources: MA Inpatient Hospital Discharge, Outpatient Observation Stay, and Outpatient ED Discharge databases, FY2009, DHCFP

MV-related Pedestrian Deaths¹

Associated Factors (NHTSA, 2009)



Of 48 MV-related pedestrian deaths in MA:

- **77% involved adults 35+**
- **65% did NOT occur at an intersection**
- **60% occurred during the day**
- **44% involved darting or stumbling into road**
- **17% involved walking, standing, etc. in road**

Sources: ¹Fatality Analysis Reporting System (FARS), 2009, NHTSA

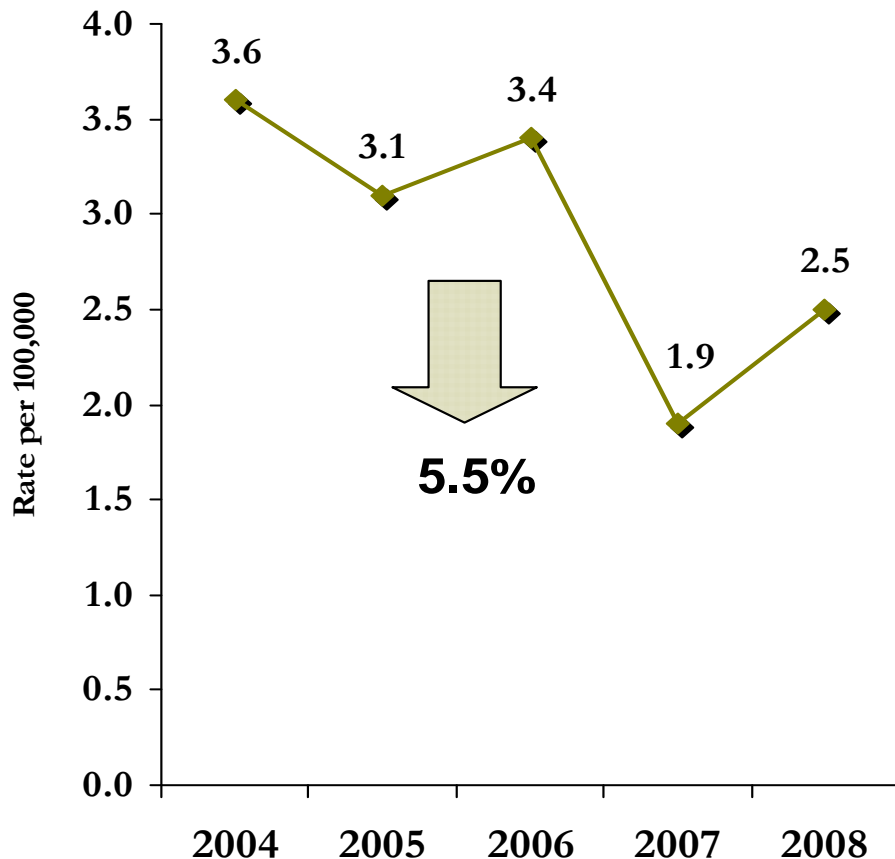


Unintentional Injury Deaths

MA Children Ages 0-14

Unintentional Injury Deaths

MA Children, Ages 0-14, 2004-2008

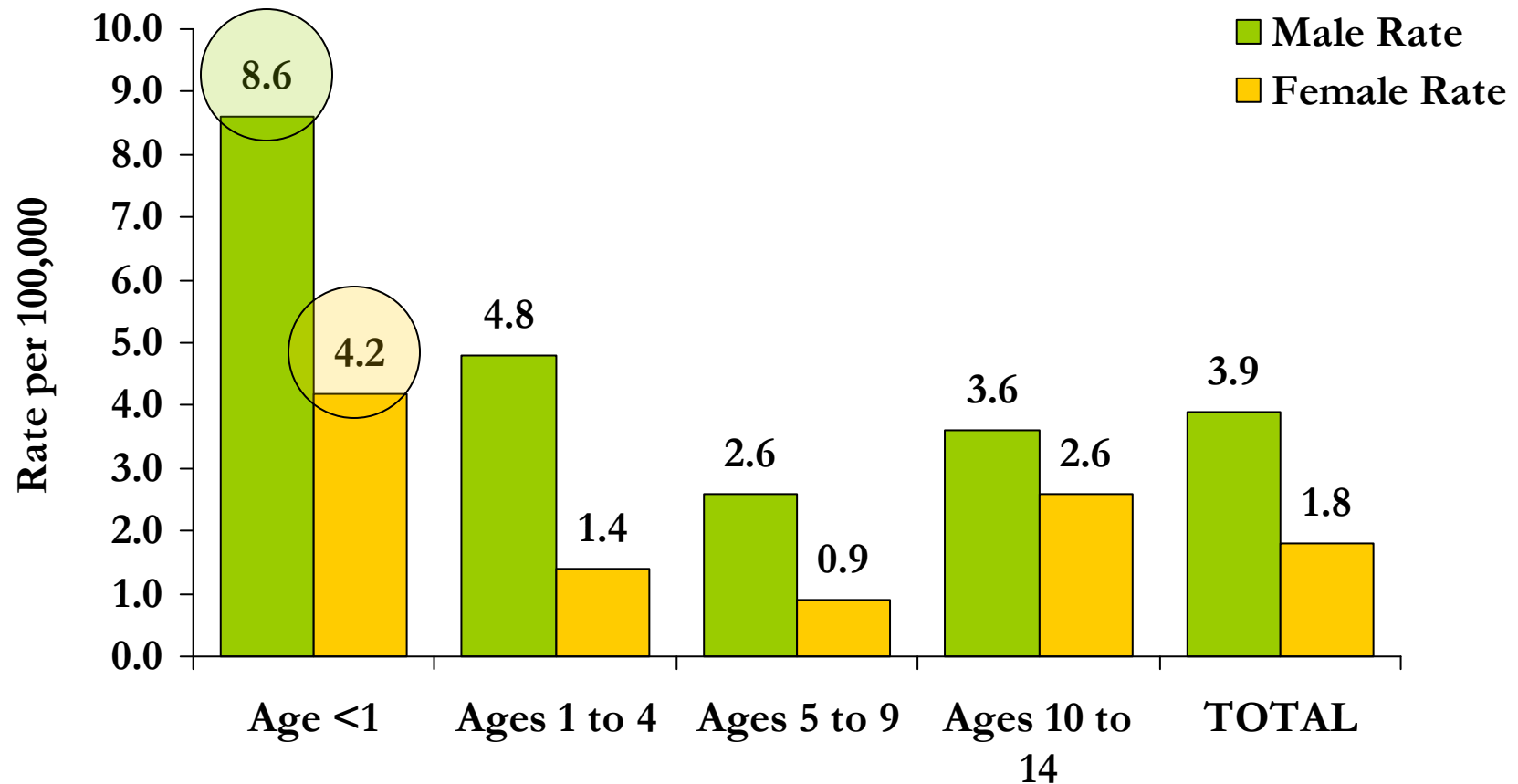


- Between 2004 and 2008 there were 174 injury deaths to MA children ages 0-14.
- During this time there was a downward trend in overall injury death rates.
 - The annual percent change was 5.5%*

*Statistically significant at the $P \leq .05$ level; the noted change is unlikely to be due to chance alone.

Unintentional Injury Deaths

Rate by Gender and Age Group, MA Children



Unintentional Injury Deaths by Cause

MA Children Ages 0-14, 2004-2008

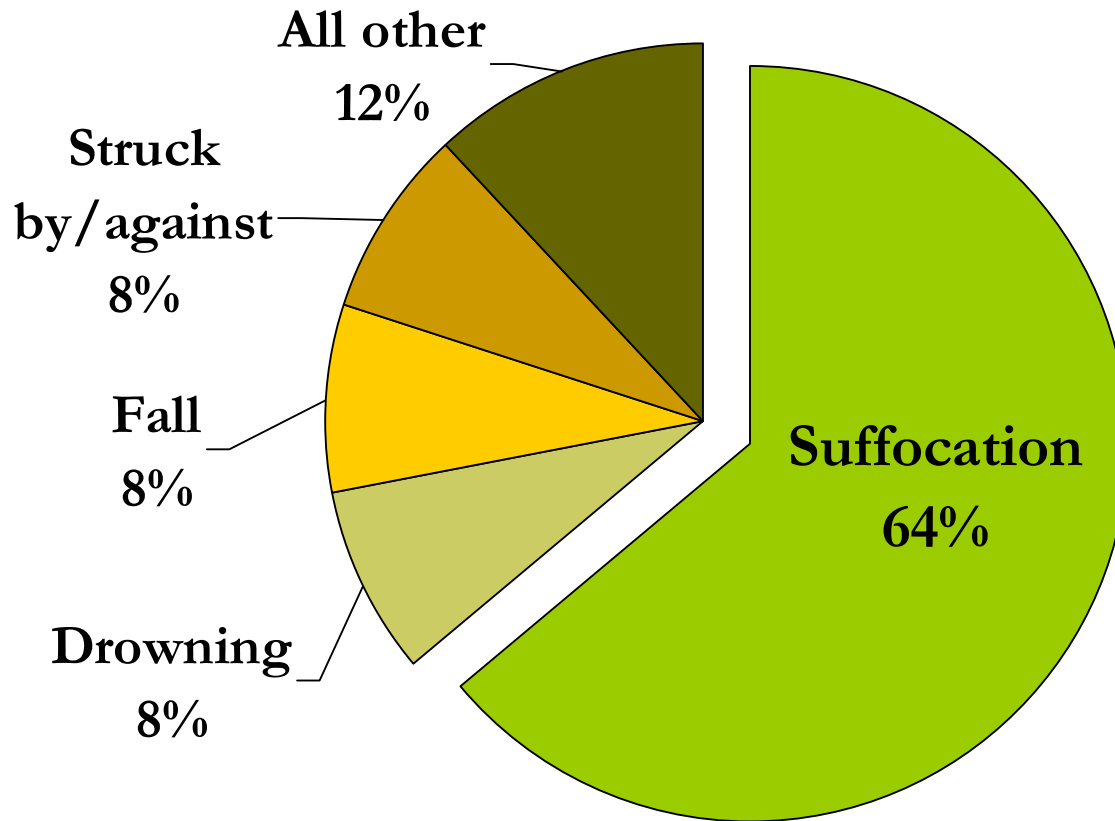
INJURY CAUSE	Total Number	Crude Rate per 100,000	Percent of Total
Transport	65	5.5	37.4
MV-occupant ¹	27	2.3	15.5
Pedestrian	24	2.0	13.8
Pedal cyclist	7	0.6	4.0
Other Transport	7	0.6	4.0
Drowning	35	3.0	20.1
Suffocation	34	2.9	19.5
Fire/burn	14	1.2	8.0
Fall	8	0.7	4.6
Poisoning	5	0.4	2.9
Struck by/against	5	0.4	2.9
Natural/environ-all other	2	0.2	1.1
Cut/pierce	1	0.1	0.6
Firearm	1	0.1	0.6
Other specified, NEC	2	0.2	1.1
Unspecified	2	0.2	1.1
Total	174	14.8	100.0

77%

Source: Registry of Vital Records and Statistics, MDPH

Unintentional Injury Deaths, 2004-2008

Leading Causes to MA Children Ages <1 Year



Among suffocation deaths

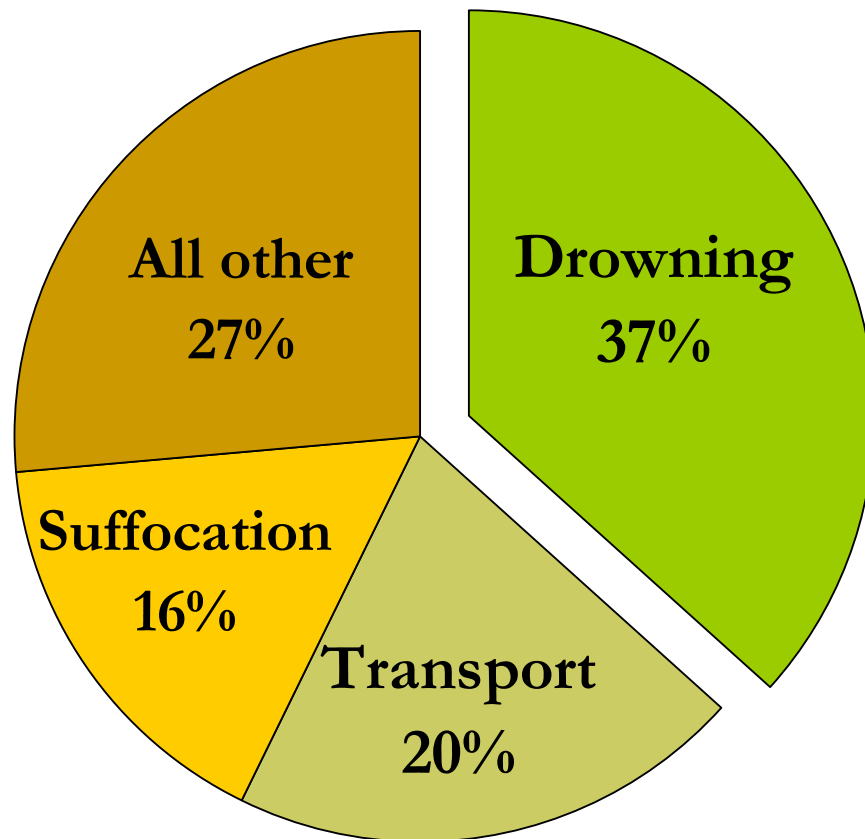
- 31.3% of deaths occurred in a bed
- 50% were unspecified

N=25

Source: Registry of Vital Records and Statistics, MDPH

Unintentional Injury Deaths, 2004-2008

Leading Causes to MA Children Ages 1 – 4



N=49

Source: Registry of Vital Records and Statistics, MDPH

Among drowning deaths

- 44% occurred in a swimming-pool
- 17% occurred in natural water

Among transport deaths

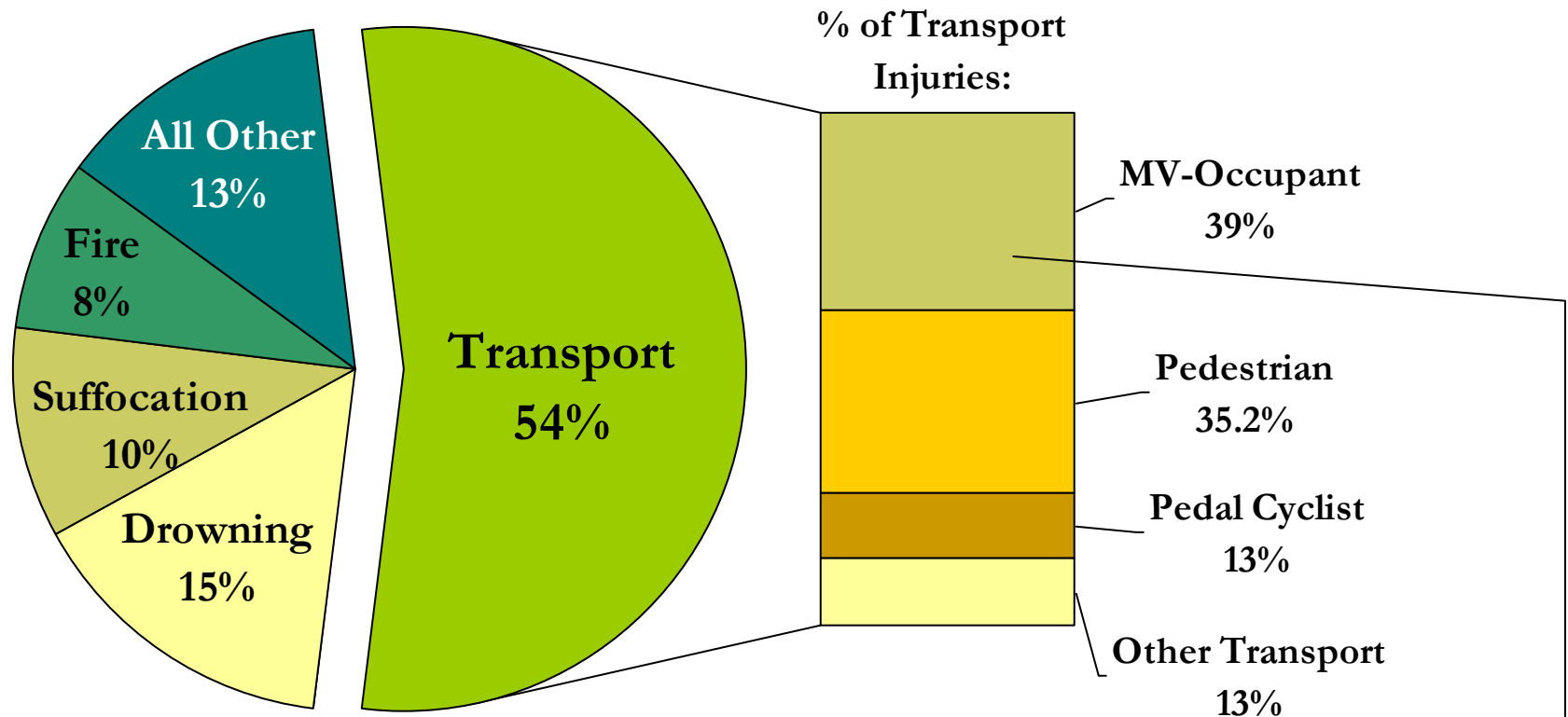
- 50% were MV-occupants and 50% were MV-pedestrian injuries
- Where restraint use was known, 31% of occupants age 4 and younger who were fatally injured, were totally unrestrained (NHTSA, 2009 Data)

Among suffocation deaths

- 43% were from inhalation/ingestion of food

Unintentional Injury Deaths, 2004-2008

Leading Causes to MA Children Ages 5 - 14



N=100

Source: Registry of Vital Records and Statistics, MDPH

Where restraint use was known, 46% of occupants age 14 and younger who were fatally injured were unrestrained. (NHTSA, 2009 Data)



Nonfatal Unintentional Injuries

MA Children Ages 0-14

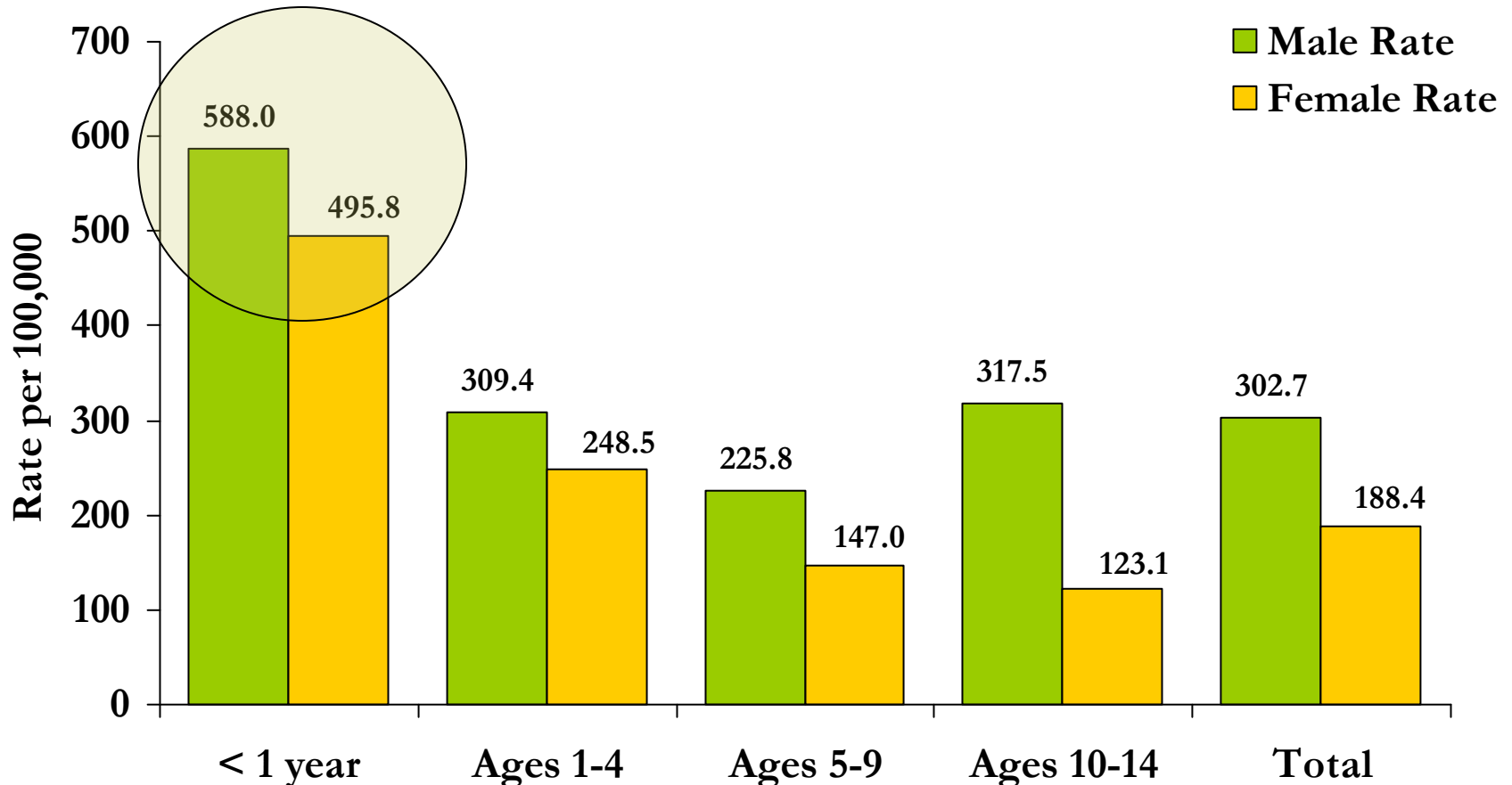
Nonfatal Unintentional Injuries

MA Children, Ages 0-14

- ❑ In 2009, there were nearly 130,000 nonfatal injuries to MA children ages 0-14.
- ❑ Nonfatal injury trends declined slightly between 2002 and 2009; 1.8% per year for hospital discharges, and <1% per year for ED visits
- ❑ Some causes, such as ED visits for MV-Occupant, MV-Pedestrian, and Pedal Cyclist injuries declined significantly (7.9%, 6.9% and 3.1% per year, respectively)

Nonfatal Unintentional Injuries

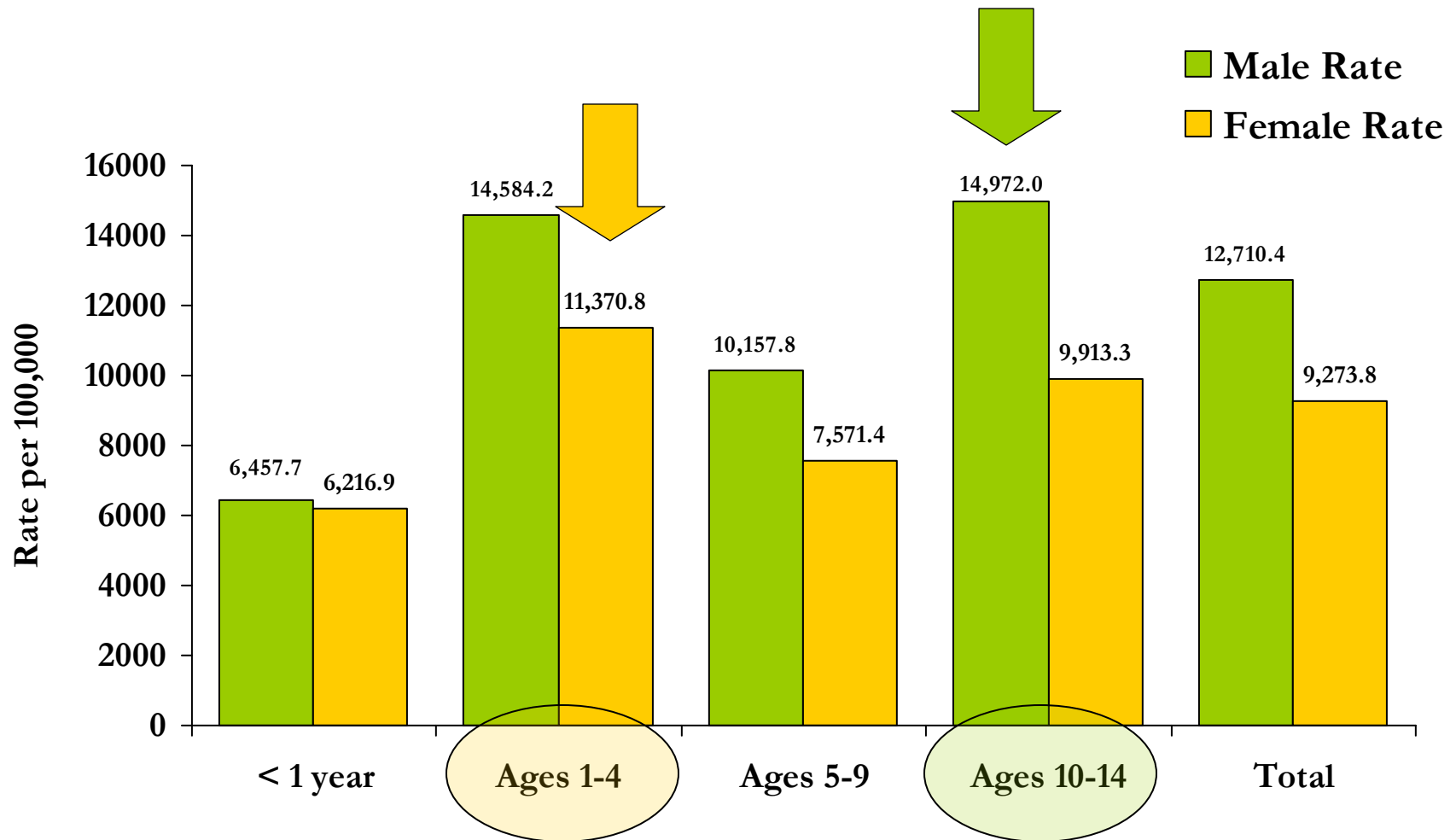
Hospital Stay Rates, MA Children, Ages 0-14, 2009



Source: MA Inpatient Hospital Discharge Database and MA Outpatient Observation Stays Database, DHCFP

Nonfatal Unintentional Injuries

ED Discharge Rates, MA Children Ages 0-14, 2009



Source: MA Outpatient Emer. Dept. Discharge Database, DHCFP

Nonfatal Unintentional Injuries

Leading Causes, MA Children, 2009

Rank	<1 year	Ages 1 - 4	Ages 5 - 9	Ages 10 - 14
1	Fall	Fall	Fall	Struck by or against object
2	Struck by or against object	Struck by or against object	Struck by or against object	Fall
3	Fire/Burn	Natural/environmental	Transport	Overexertion
4	Natural/environmental	Cut/pierce	Cut/pierce	Transport
5	Cut/pierce	Overexertion	Natural/environmental	Cut/pierce

60%

Sources: MA Inpatient Hospital Discharge Database, and MA Outpatient Emer. Dept. Discharge Database, DHCFP

According to youth surveys conducted, 9% of middle school students and 14% of high school students reported minimal seat belt use (i.e., never or rarely wear a seat belt while in a car). 2009 MYRBS; MYHS

Nonfatal Unintentional Fall Injuries

Circumstance by Age Group, MA Children, 2009

Unintentional Falls	< 1 year	Ages 1-4	Ages 5-9	Ages 10-14	Rank
Fall from slipping, tripping, or stumbling	108	2,773	2,578	3,201	1
Fall from recreational equip. such as roller skates, skateboard, snowboard	2	116	852	2,210	2
Fall resulting in striking against sharp or other object	250	3,544	1,737	934	3
Fall from or out of building or other structure	1	38	28	23	
Fall on or from ladder, scaffolding, steps or stairs	291	1,921	707	823	
Fall on same level from collision, pushing, shoving by/with other person	0	45	227	997	
Fall from furniture	1,260	3,184	937	297	
Fall from playground equipment	8	777	1,706	482	
Fall, other/unspecified	1,036	5,201	4,228	4,926	
TOTAL	2,956	17,599	13,000	13,893	

Source: MA Inpatient Hospital Discharge Database, MA Outpatient Emergency Department Discharge Database, and MA Outpatient Observation Stays Database, DHCFP

Nonfatal Unintentional Injuries Struck by or Against an Object Circumstance by Age Group, MA Children, 2009

Unintentional Struck by or Against an Object	< 1 year	Ages 1-4	Ages 5-9	Ages 10-14	Rank
Striking against in sports with or without subsequent fall	6	104	1,569	9,105	1
Striking against other stationary object with or without subsequent fall	85	1,264	1,031	1,124	2
Striking against furniture with or without subsequent fall	70	1,155	517	219	3
Struck accidentally by falling object	72	618	452	412	
Striking against with or without subsequent fall, other	353	3,788	4,628	5,099	
TOTAL	586	6,929	8,197	15,959	

Source: MA Inpatient Hospital Discharge Database, MA Outpatient Emergency Department Discharge Database, and MA Outpatient Observation Stays Database, DHCFP

- **In 2009**, of those students who reported having played on a sports team in the past year, 19% of middle school and 18% of high school students reported having **suffered a blow or jolt to the head while playing** (MYRBS; MYHS)

Traumatic Brain Injuries to Children

MA Children, Ages 0-14

In 2008, 41% of ALL injury deaths to children in the 0-14 age group were associated with a TBI.

- 75% resulted from transportation-related injuries, of which more than 50% were pedestrian-related.

There were more than 16,000 TBI-associated in-patient hospitalizations and emergency department discharges to children ages 0-14 in 2009.

- For children ages 0-9 the leading cause was fall, among those 10-14 years old, struck-by or against an object was the leading cause.

Unintentional Injuries:

General Contributing Factors

EXTRA INFO

Young children are:

- Developing cognitive, perceptual, and behavioral abilities
- Sensory abilities such as peripheral vision
- As well as, overall comprehension and judgment¹

Older kids and teens:

- Beginning to engage in recreational activities and sports
- Highly mobile age groups
- Social influences may contribute to higher risk behavior

Parental, cultural, and societal attitudes and influences

1. AAP Policy Statement:
www.pediatrics.org/cgi/doi/10.1542/peds.2009-1143

Unintentional Injuries:

EXTRA INFO

Protective Factors and Strategies

Drowning:

- Adequate/designated supervision around water
- Adequate fencing (e.g. height, stand alone fence) around pools
- Use multiple layers of protection

Suffocation

- Decrease the practice of bed sharing
- Increase awareness/use of "Back to Sleep"

Transport:

- Increase and correctly use child safety seats, booster seats
- Increase use of seat belts

Falls & Struck by:

- Adequate supervision
- Use of protective gear in sports/recreation
- Increase adoption of concussion guidelines
- Install window guards (Children Can't Fly)

MDPH Injury Data Contacts:

Injury Surveillance Program Jeanne Hathaway	jeanne.hathaway@state.ma.us 617-624-5601
Beth Hume Injury Surveillance Program	beth.hume@state.ma.us 617-624-5648
Holly Hackman Injury Prevention and Control Program	holly.hackman@state.ma.us 617-624-5466