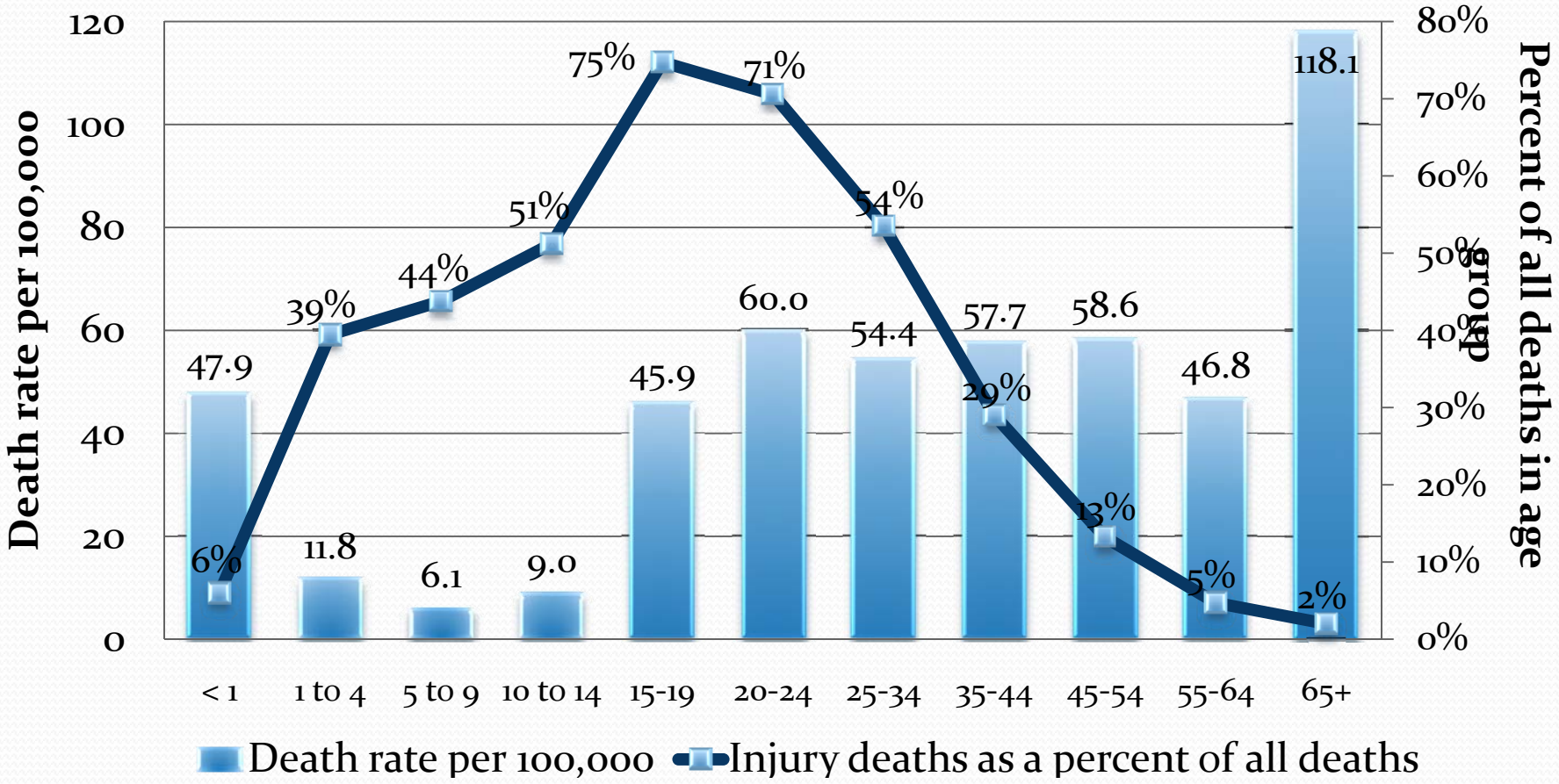
Violence and Injury Prevention Program

Ohio Department of Health
Violence and Injury Prevention Program

Leading Causes of Death by Age Group, Ohio, 2003-06

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Congenital Anomalies 891	Unintl Injury 214	Unintentl Injury 170	Unintent. Injury 186	Unintent Injury 2,030	Unintent Injury 1,831	Malignant Neoplasms 2,497	Malignant Neoplasms 9,010	Malignant Neoplasms 17,117	Heart Disease 95,494	Heart Disease 116,634
2	Short Gestation 773	Congenital Anomalies 84	Malignant Neoplasms 77	Malignant Neoplasms 82	Suicide 659	Suicide 822	Unintent Injury 2,385	Heart Disease 6,812	Heart Disease 11,305	Malignant Neoplasms 70,054	Malignant Neoplasms 99,693
3	SIDS 362	Homicide 56	Homicide 29	Suicide 49	Homicide 652	Homicide 600	Heart Disease 2,210	Unintent Injury 2,715	Chronic Low. Respiratory Disease 2,371	Cerebro-vascular 22,433	Cerebro-vascular 25,518
4	Maternal Pregnancy Comp. 337	Malignant Neoplasms 46	Congenital Anomalies 28	Homicide 36	Malignant Neoplasms 251	Malignant Neoplasms 553	Suicide 982	Liver Disease 1,113	Diabetes Mellitus 2,072	Chronic Low. Respiratory Disease 21,070	Chronic Low. Respiratory Disease 24,457
5	Placenta Cord Membranes 239	Heart Disease 37	Heart Disease 14	Congenital Anomalies 32	Heart Disease 169	Heart Disease 516	Homicide 416	Suicide 1,112	Cerebro-vascular 1,597	Alzheimer's Disease 12,771	Unintent Injury 17,250
6	Unintentional Injury 231	Influenza & Pneumonia 19	Cerebro-vascular 9	Heart Disease 20	Congenital Anomalies 81	Diabetes Mellitus 107	Liver Disease 382	Diabetes Mellitus 1,056	Unintent Injury 1,468	Diabetes Mellitus 11,279	Diabetes Mellitus 14,901
7	Respiratory Distress 143	Septicemia 15	Septicemia 8	Influenza & Pneumonia 10	Cerebro-vascular 31	HIV 93	Diabetes Mellitus 349	Cerebro-vascular 1,011	Liver Disease 1,041	Influenza & Pneumonia 7,824	Alzheimer's Disease 12,872
8	Bacterial Sepsis 125	Perinatal Period 12	Influenza & Pneumonia 7	Septicemia 8	Diabetes Mellitus 31	Cerebro-vascular 80	HIV 344	Chronic Low. Respiratory Disease 784	Nephritis 705	Nephritis 6,371	Influenza & Pneumonia 8,897

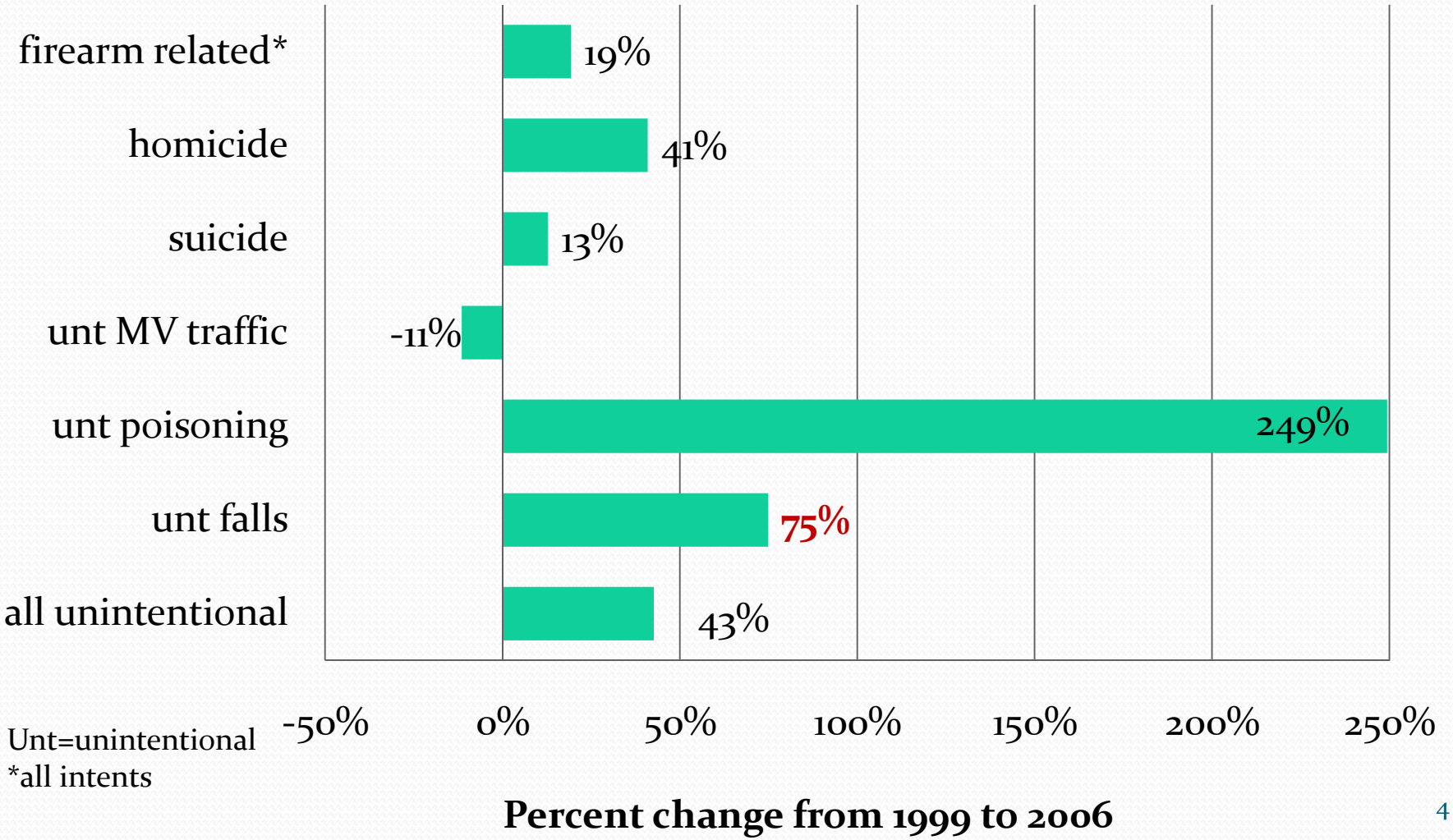
Proportion of all deaths due to injury and injury death rate per 100,000 by age group, Ohio, 2002-05



*Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2005. CDC WONDER

Percentage change in number of annual deaths for leading causes of injury, by mechanism and intent - Ohio, 1999 to 2006[1]

[1]Source: Ohio Dept of Health, Office of Vital Statistics



Unt=unintentional
*all intents

Evidence-Based Programs

Evidenced-based Programs

- CDC Fall Prevention Activities
  http://www.cdc.gov/ncipc/duip/FallsPreventionActivity.htm
- Multi-factorial and Physical Activity Programs for Fall Prevention
  http://www.stopfalls.org/grantees_info/files/Multi_factorial.pdf
- National Council on Aging – Center for Healthy Aging – Fall Prevention
  http://www.healthyagingprograms.org/content.asp?sectionid=98

CDC Fall Prevention Resources

- **Preventing Falls: What Works A CDC Compendium of Effective Community-based Interventions from Around the World -** This compendium, designed for public health practitioners and community-based organizations, describes 14 scientifically tested and proven interventions. **http://www.cdc.gov/ncipc/preventingfalls/CDCCompendium_030508.pdf**

- **Preventing Falls: How to Develop Community-based Fall Prevention Programs for Older Adults** This "how to" guide is designed for community-based organizations who are interested in developing their own effective fall prevention programs. **http://www.cdc.gov/ncipc/preventingfalls/CDC_Guide.pdf**

Multi-factorial approach includes all of the following components:

- **Medical Management** - Risk assessment by a health professional.
- **Balance and Mobility** - Increasing and improving physical activity (PA) or increasing access to PA opportunities.
- **Environmental Modification** - Home safety (Projects should address other home safety hazards for older adults as well; e.g., fire/burns, poisoning/medications, etc.).

Multi-faceted programs involve a comprehensive approach including the following elements:

1. **Coalition Building**
2. **Surveillance and Needs Assessment**
3. **Policy Enactment (Adoption) and Enforcement** (may include ordinances, laws, policies, regulations, etc.)
4. **Environment, Engineering and Systems Change** (may include alternative activities/ opportunities)
5. **Training and Education**
6. **Media Advocacy, Campaigns, Information and Support**

The effectiveness of the Objectives will be **Evaluated.**

Falls Among Older Adults in Ohio Report

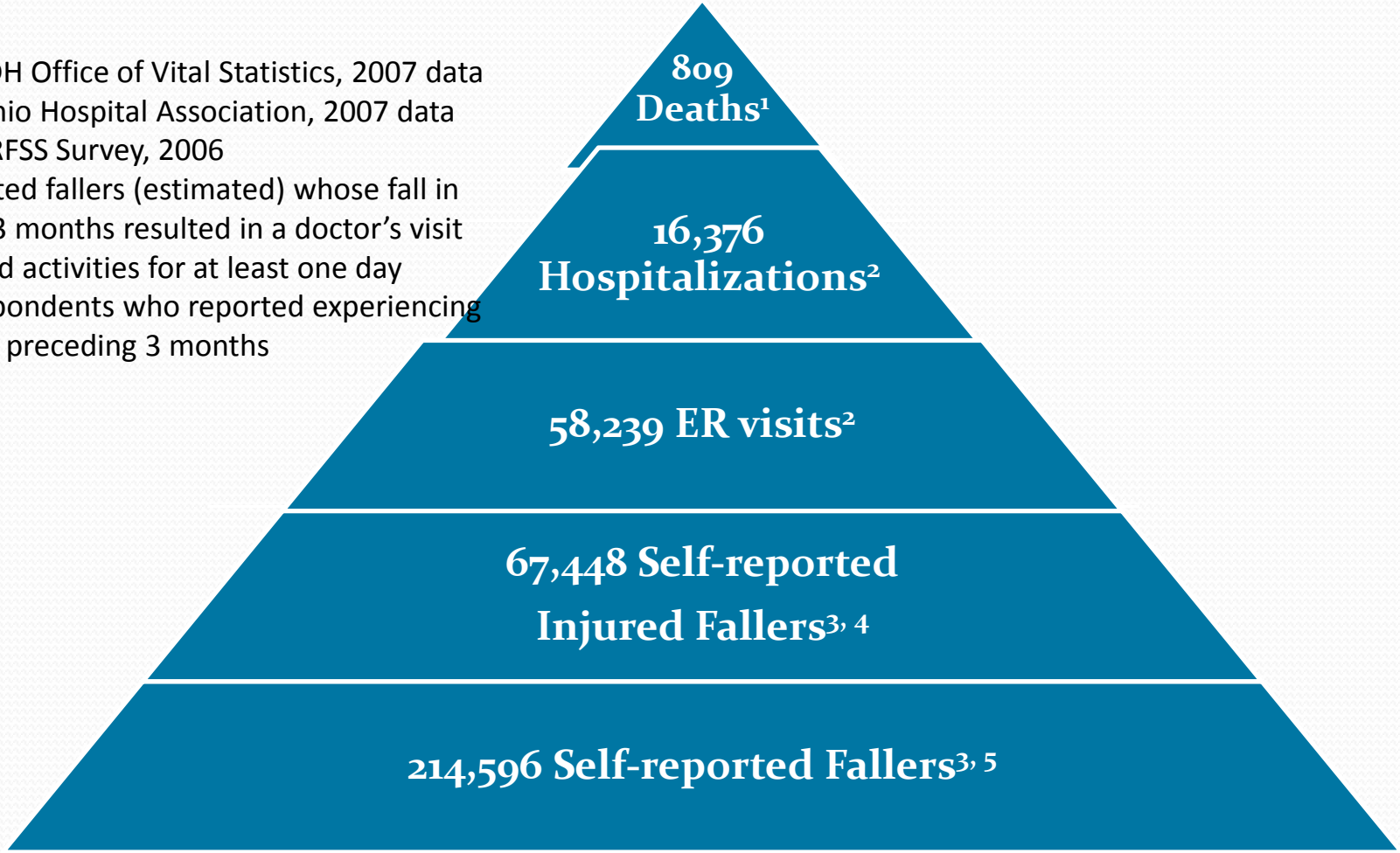
http://www.healthyohioprogram.org/diseaseprevention/falls.aspx

Key Points

- Falls among older adults have reached epidemic proportions and rates continue to rise.
- Older adults account for a disproportionate share of fall-related injury.
- The likelihood of falling and the severity of fall-related injury increases with age, and therefore the risk for hospitalization and death.
- Age and gender play a large role in determining risk for type of fall.
- Older adults with poor health status and those who are isolated are at greater risk for falling.

Number of fall-related deaths,[1] HIDs[2] and ER visits,[2] and self-reported injured fallers[3,4] and fallers,[3,5] for ages 65 and older, Ohio, 2007[1,2] (2006 BRFSS[3,4,5])

[1]Source:ODH Office of Vital Statistics, 2007 data
[2]Source: Ohio Hospital Association, 2007 data
[3]Source: BRFSS Survey, 2006
[4]Self-reported fallers (estimated) whose fall in preceding 3 months resulted in a doctor's visit or restricted activities for at least one day
[5]BRFSS respondents who reported experiencing a fall in the preceding 3 months

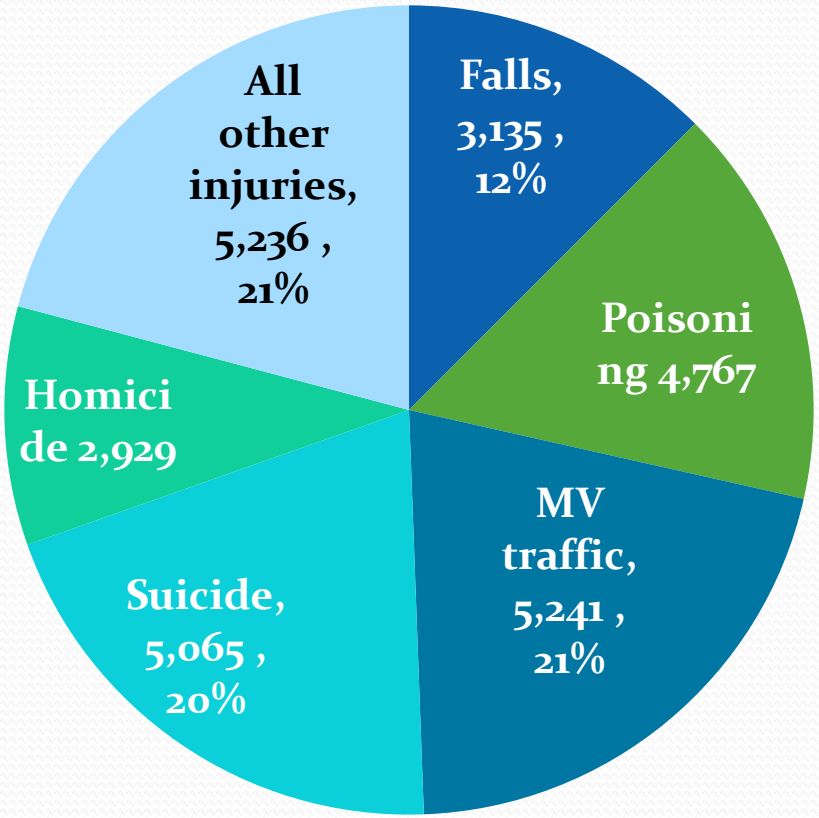


Falls in Comparison to Other Injuries

Proportion of injury deaths and inpatient hospitalizations by cause (for top 5 injury causes and all other causes), all ages, Ohio*

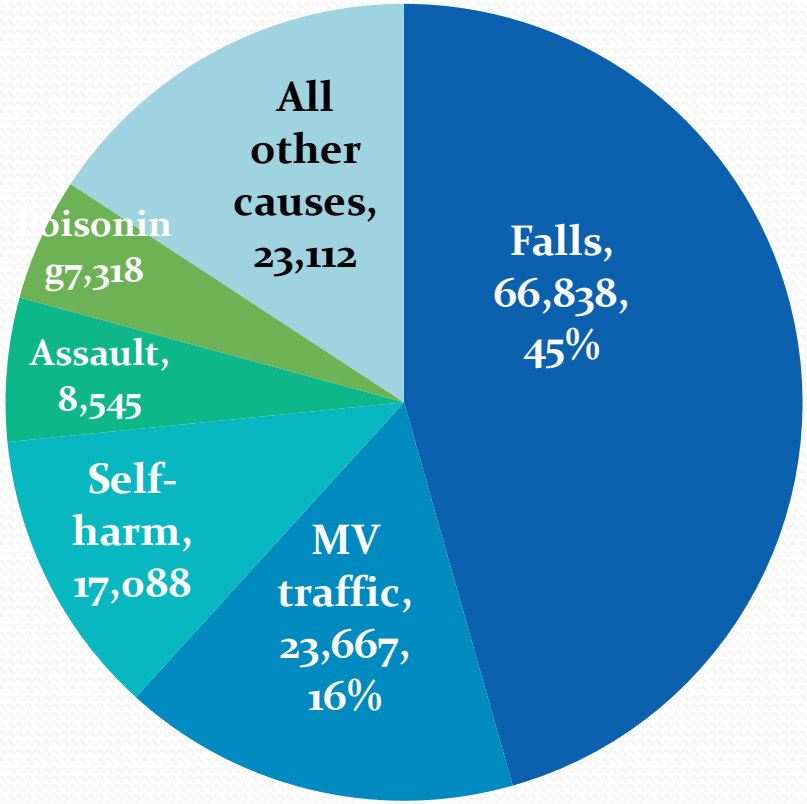
*Unintentional unless homicide/assault or suicide/self harm

Deaths, 2002-06*



*Source: ODH Vital Statistics

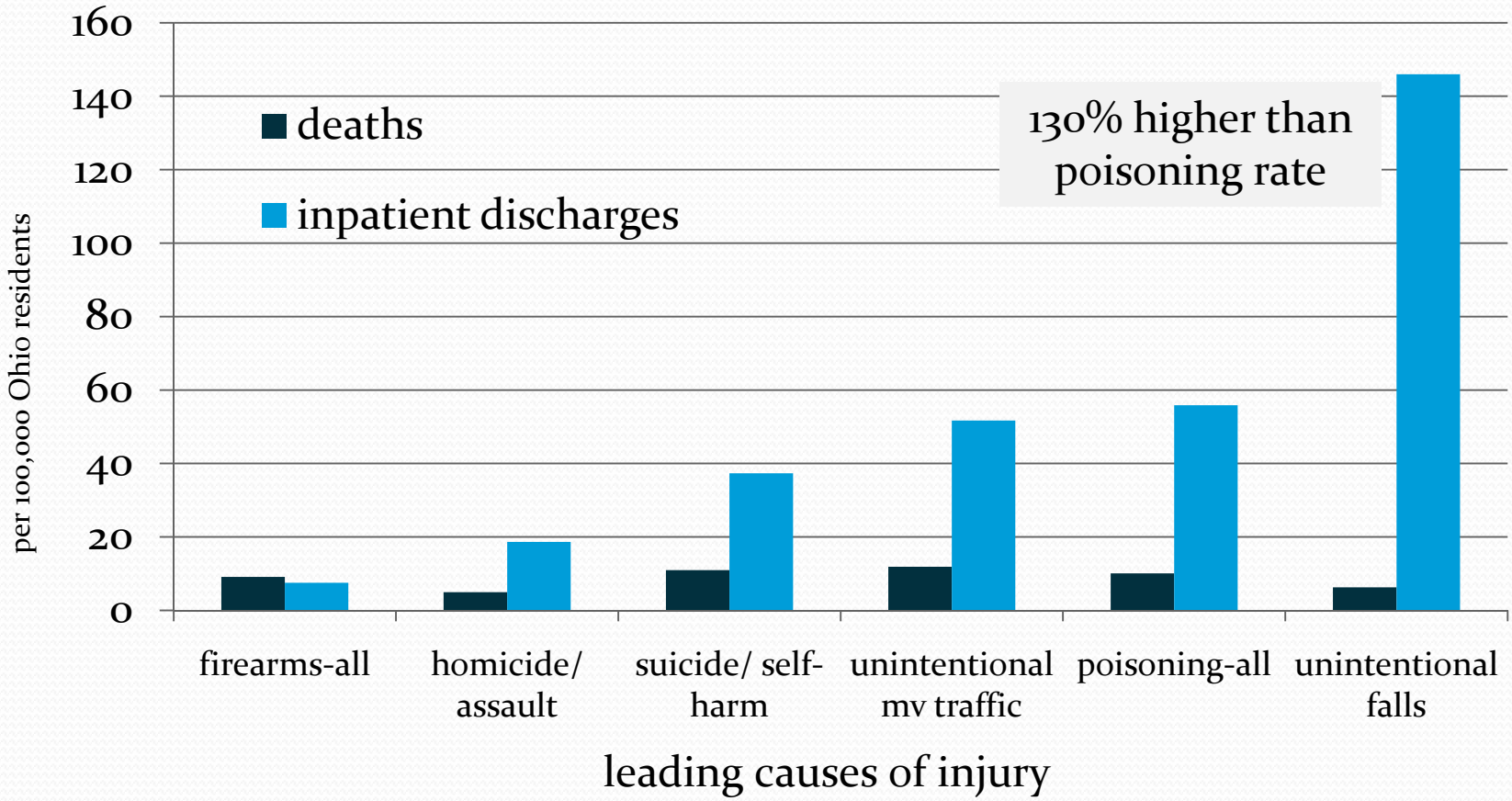
Hospitalizations, 2002-05+



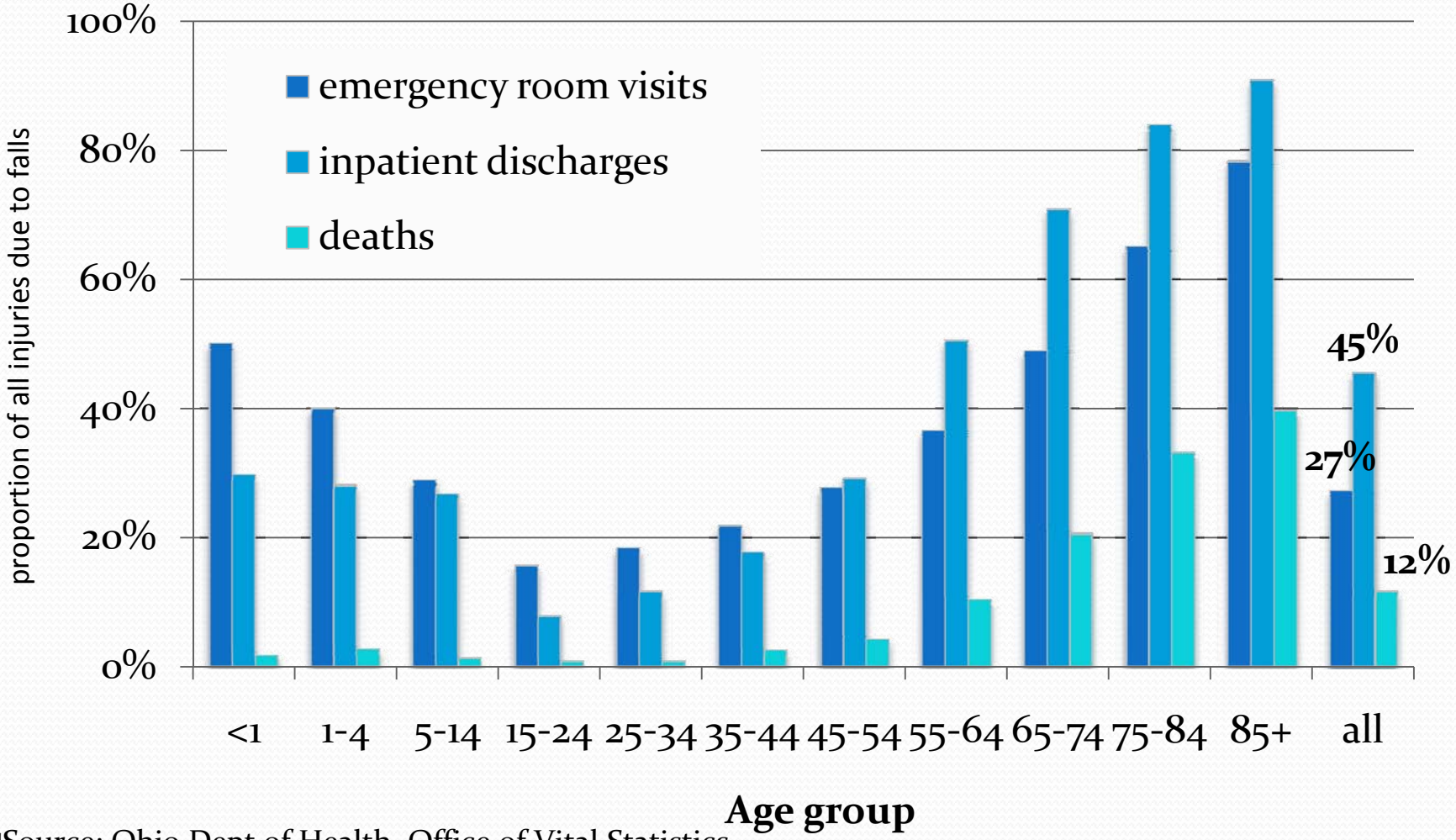
+Source: Ohio Hospital Association

Average annual injury death[1] and inpatient discharge rates (per 100,000), for leading causes of injury, Ohio, 2002-05

[1]Source: Ohio Dept. of Health, Office of Vital Statistics

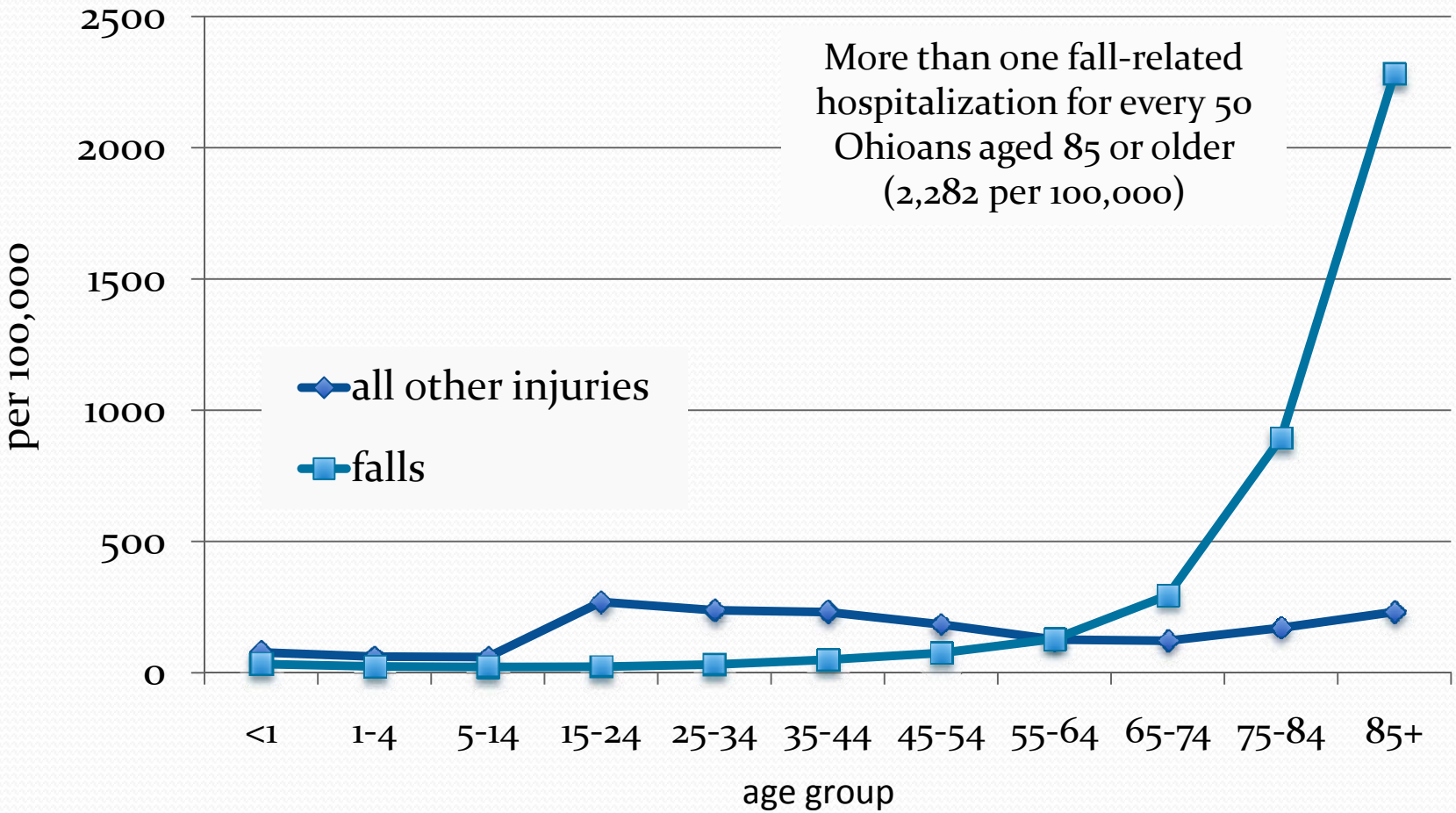


Proportion of injury-related ER visits, inpatient Hospitalizations and deaths[1] due to falls, by age group, Ohio, 2002-05



[1]Source: Ohio Dept of Health, Office of Vital Statistics

Average annual fall-related and all other injury combined inpatient hospitalization rates[1] by age group, Ohio, 2002-05[2]



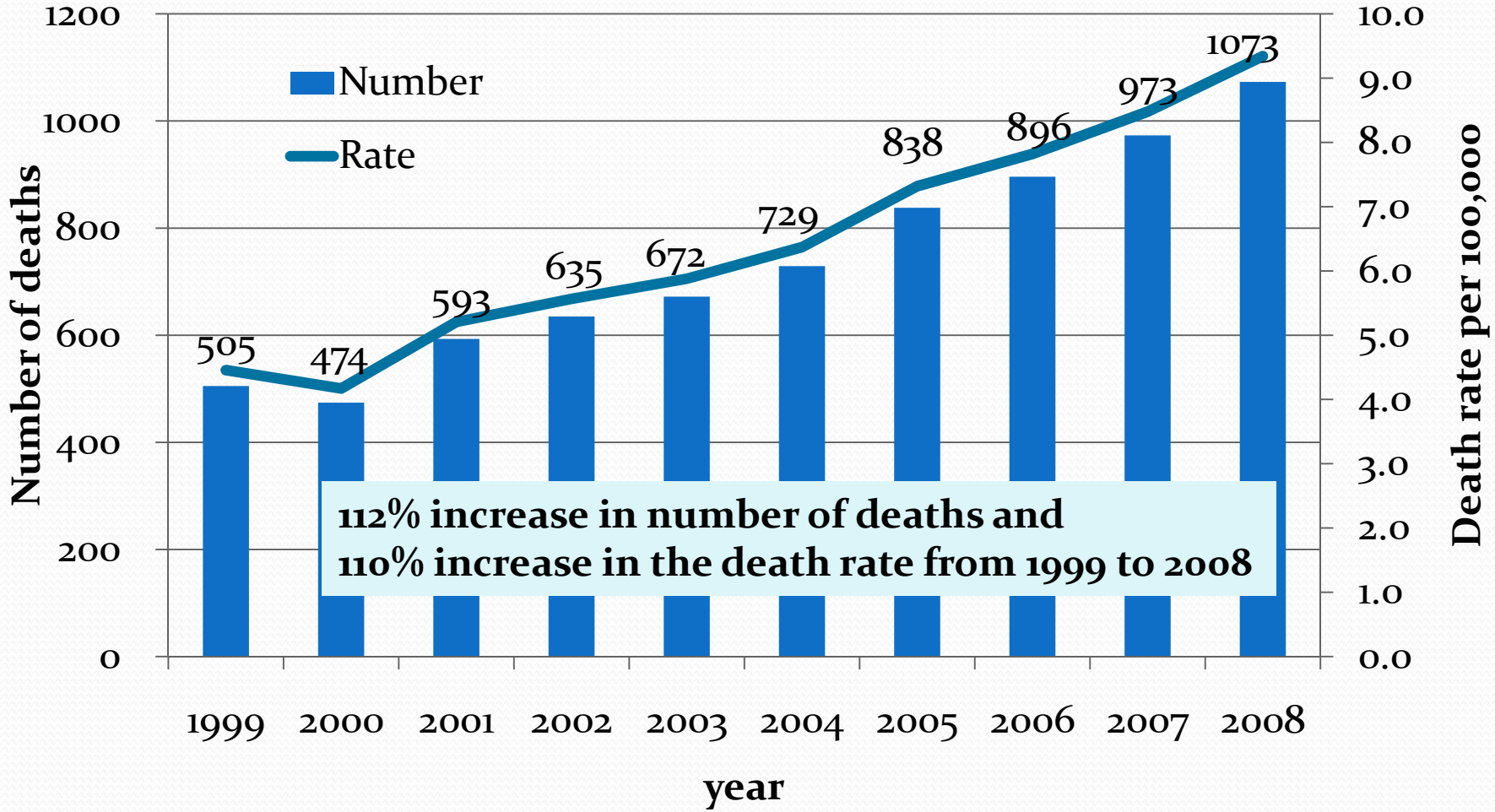
[1]per 100,000

[2]Source: Ohio Hospital Association

Age Group	Deaths by Intent (All unintentional except homicide/suicide)	Inpatient Discharges	Emergency Room Visits
lt 1	Suffocation (178) Homicide (57) Drowning (10)	Falls (193) Assault (191) Other Specified (41)	Falls (9,294) Struck by/against (2,617) Other Specified (1,559)
1-4	Drowning (62) Homicide (57) MV Traffic (48)	Falls (572) Poisoning (407) MV Traffic (253)	Falls (75,619) Struck by/Against (34,312) Other Specified (18,606)
5-14	MV Traffic (177) Suicide (57) Homicide (49)	Falls (1,385) MV Traffic (1,084) Struck by/against (514)	Falls (131,982) Struck by/against (115,452) Overexertion (39,295)
15-24	MV Traffic (1,354) Suicide (646) Homicide (633)	MV Traffic (5,976) Self-harm (3,932) Assault (2,546)	Struck by/against (115,612) MV Traffic (106,304) Falls (99,403)
25-34	MV Traffic (830) Suicide (817) Poisoning (626)	MV Traffic (3,889) Self-harm (3,794) Assault (2,111)	Falls (91,975) Overexertion (84,952) Struck by/against (70,484)
35-44	Poisoning (1,034) Suicide (1,019) MV Traffic (835)	Self-harm (4,561) MV Traffic (3,963) Falls (3,350)	Falls (96,488) Overexertion (72,837) Struck by/against (56,332)
45-54	Suicide (1,045) Poisoning (1,009) MV Traffic (755)	Falls (5,081) MV Traffic (3,389) Self-harm (2,979)	Falls (90,173) Overexertion (45,445) MV Traffic (41,536)
55-64	Suicide (608) MV Traffic (480) Poisoning (237)	Falls (5,906) MV Traffic (2,047) Self-harm (888)	Falls (61,668) MV Traffic (20,991) Overexertion (18,800)
65-74	MV Traffic (370) Suicide (365) Falls (362)	Falls (9,044) MV Traffic (1,301) Poisoning (628)	Falls (51,049) MV Traffic (10,752) Cut/pierce (9,140)
75-84	Falls (928) MV Traffic (409) Unspecified (381)	Falls (19,859) MV Traffic (1,296) Poisoning (495)	Falls (66,885) MV Traffic (6,708) Struck by/against (6,482)
85+	Falls (1,027) Unspecified (711) Suffocation/hanging (263)	Falls (18,148) MV Traffic (440) Unspecified (329)	Falls (42,512) Struck by/against (2,847) Overexertion (1,577)
Totals*	MV Traffic (5,435) Suicide (5,023) Poisoning (3,459) Falls (2,874*)	Falls (66,845*) MV Traffic (23,670*) Self-harm (17,089*) Assault (8,545*)	Falls (817,067*) Struck by/against (465,438*) Overexertion (370,253*) MV Traffic (337,825*)

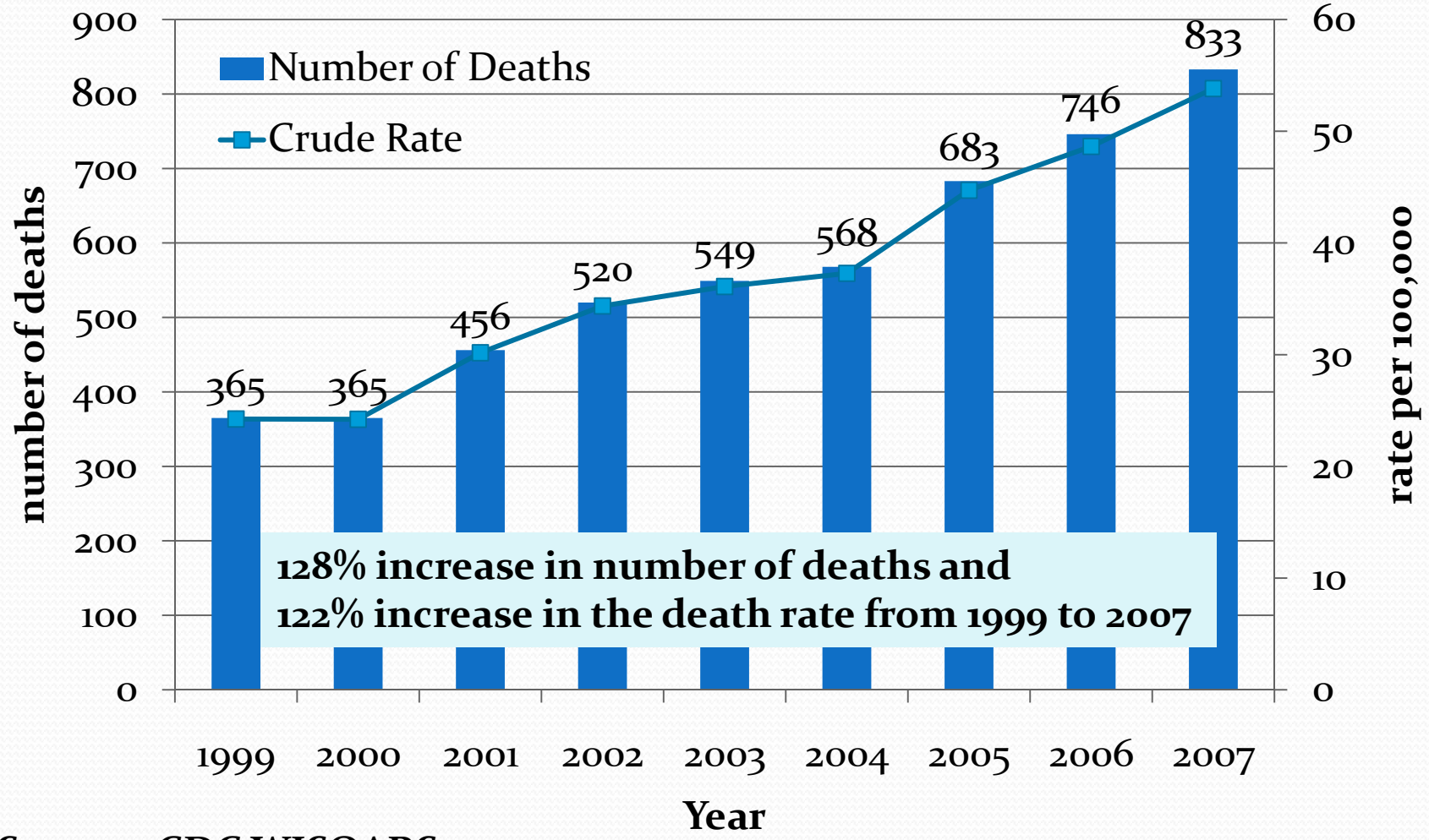
Trends over Time

Annual number and rate per 100,000 of fatal falls by year, Ohio, 1999 to 2008*



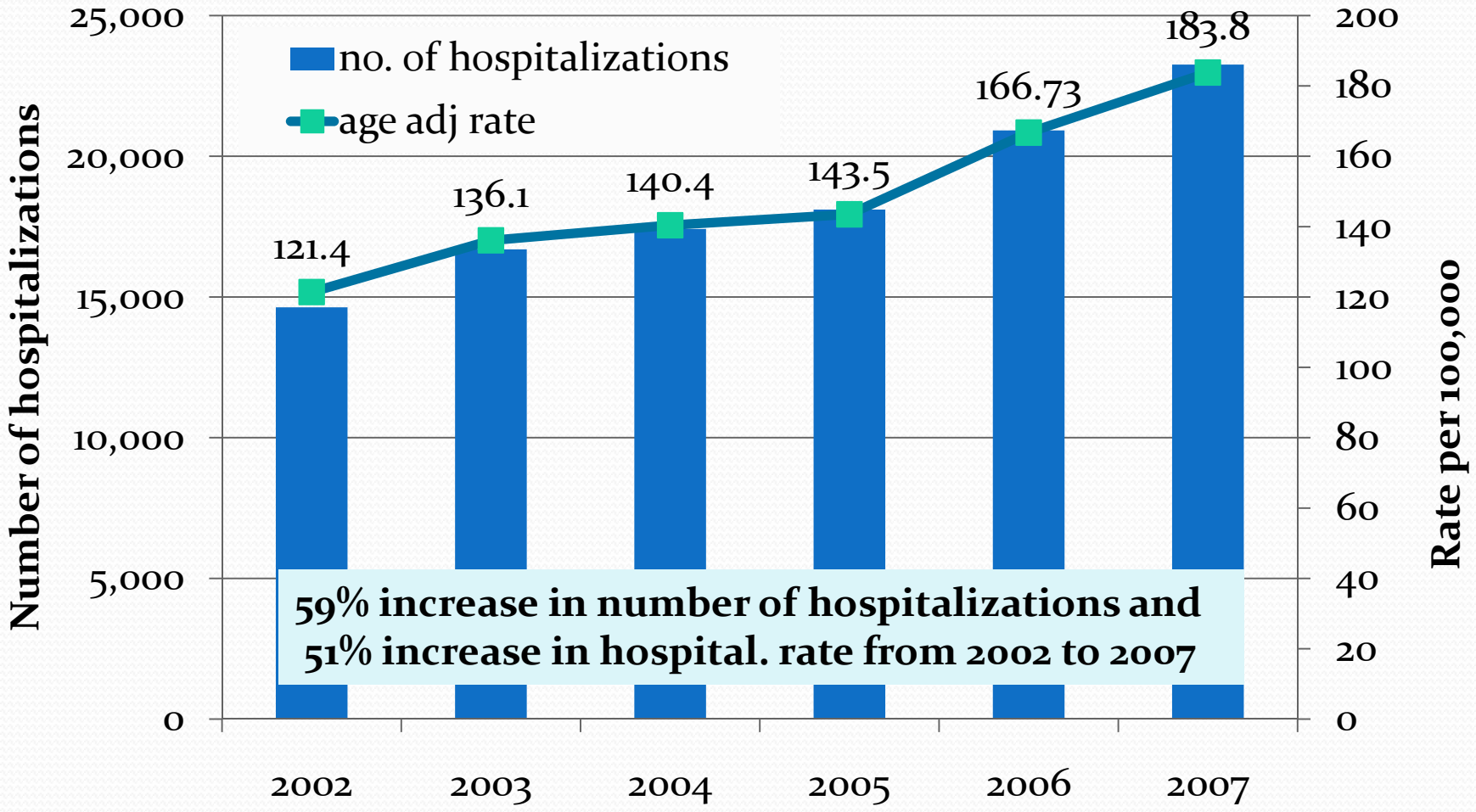
*Source: ODH Office of Vital Statistics

Annual number and rate per 100,000 of fatal falls by year, ages 65 and older, Ohio, 1999 to 2007*



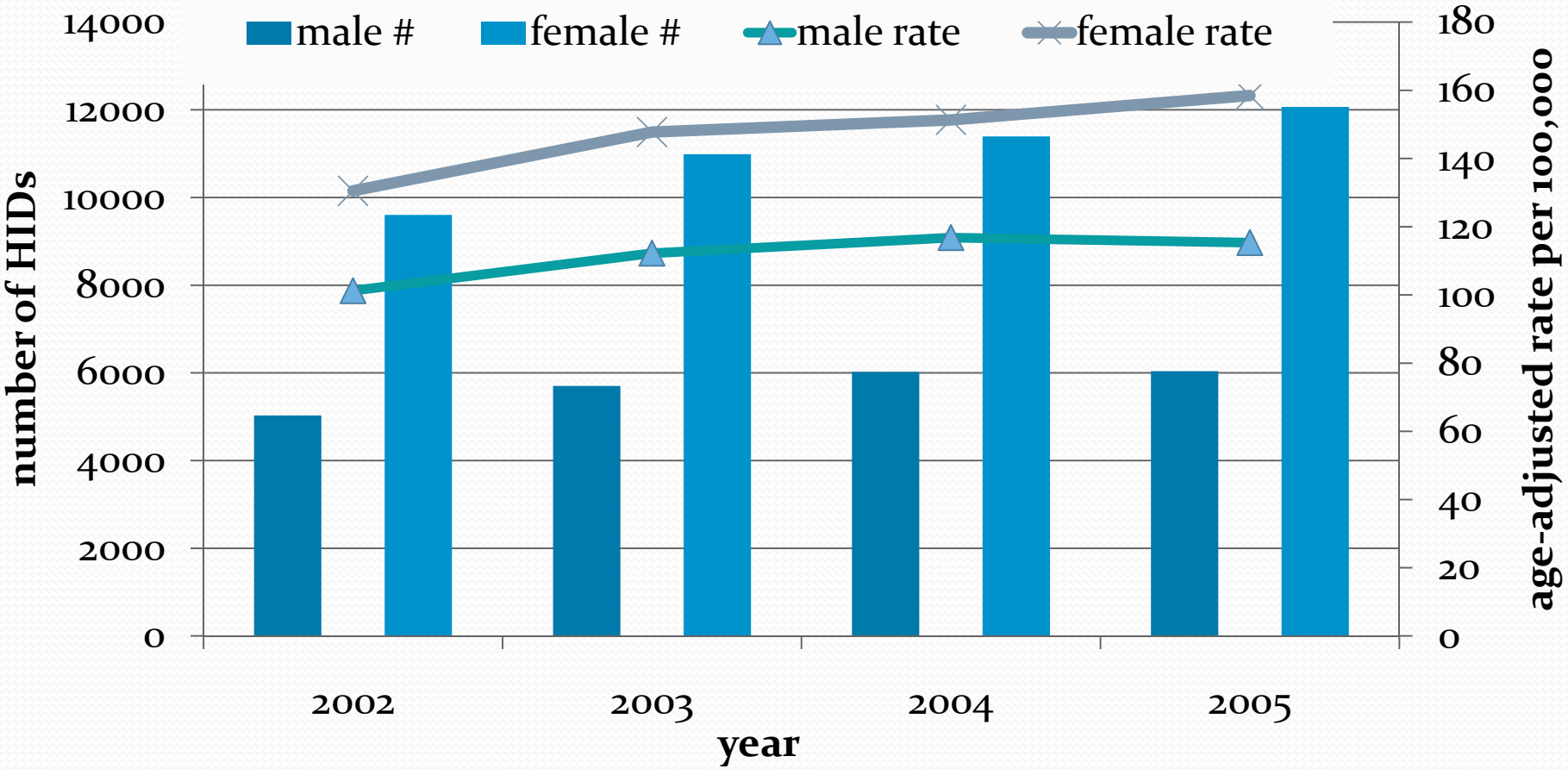
*Source: CDC WISQARS

Annual number and rate per 100,000 of fall-related inpatient hospitalizations by year, Ohio, 2002-07*



*Source: Ohio Hospital Association

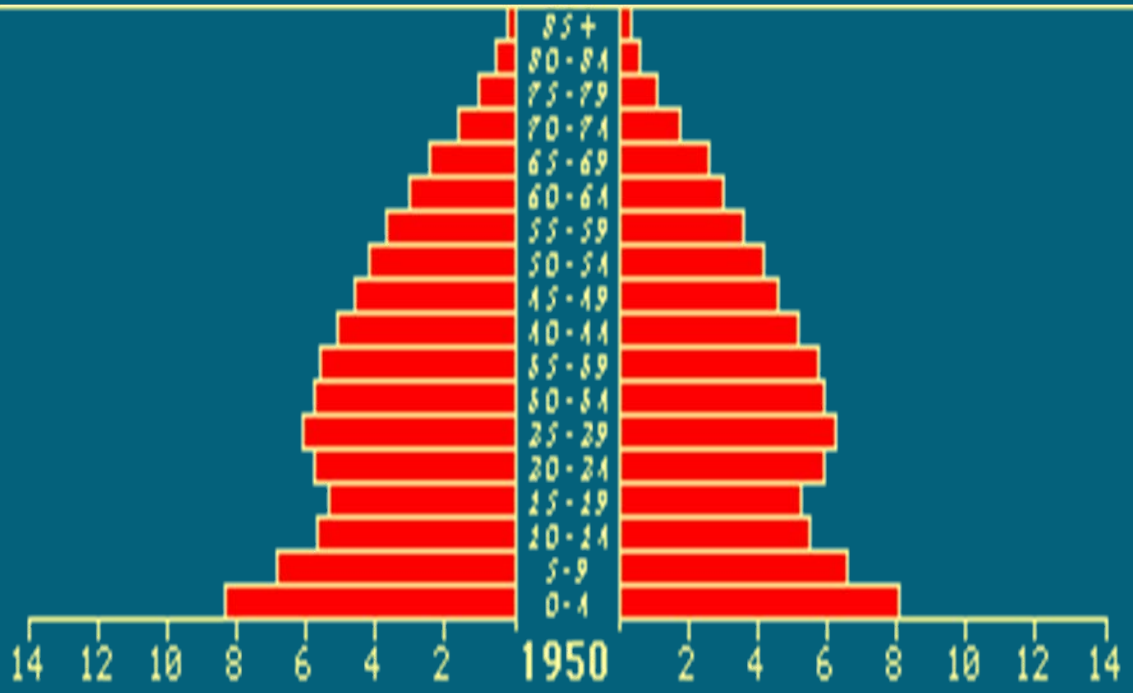
Number and age-adjusted rate[1] of fall-related inpatient discharges[2], by year, sex, Ohio, 2002-05



[1]per 100,000

[2]Source: Ohio Hospital Association

Ohio Population Projections: Growing Age 60+ Population

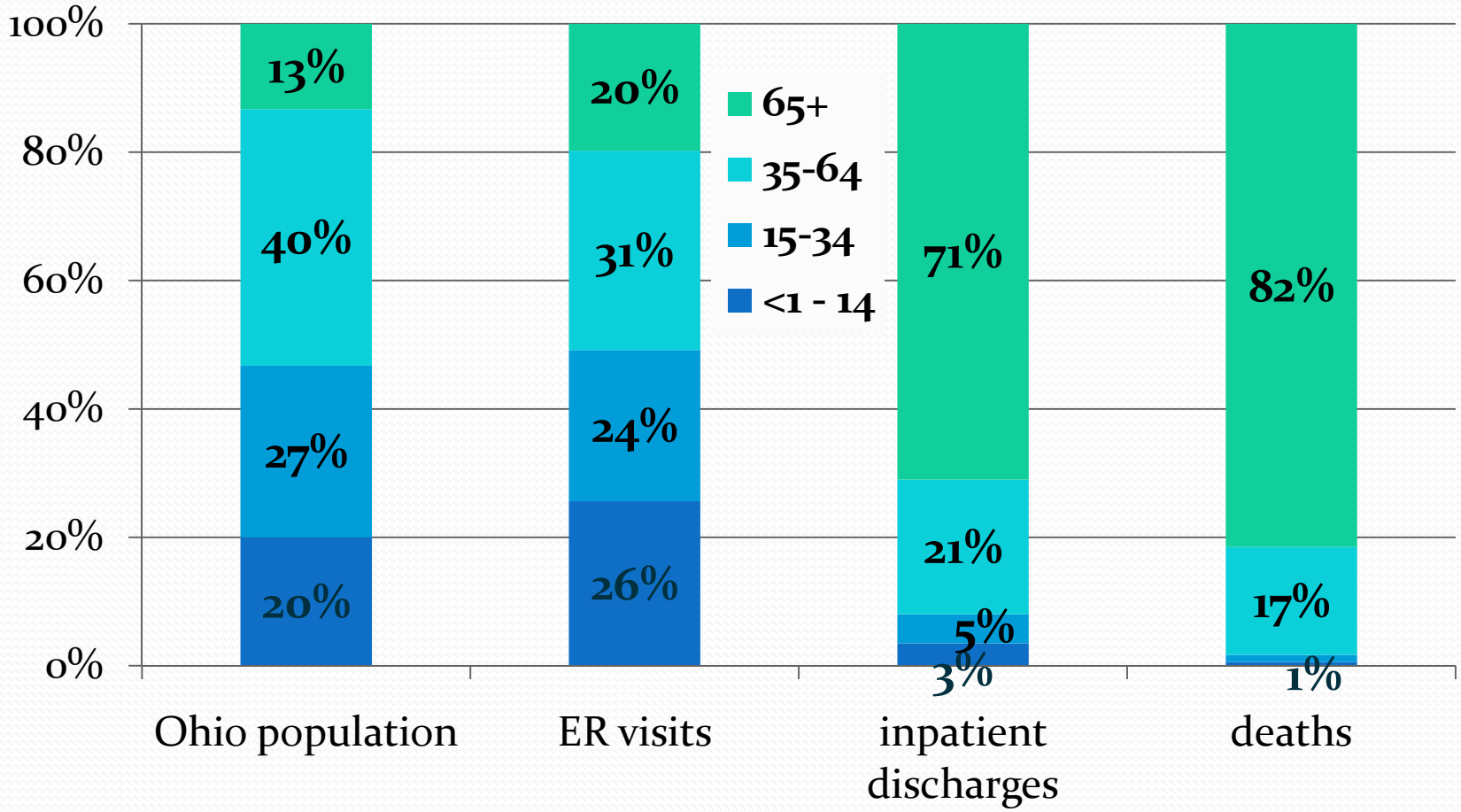


Male Age 60+ Population Female

50 Percent growth in 65 years and older from 2010-2030

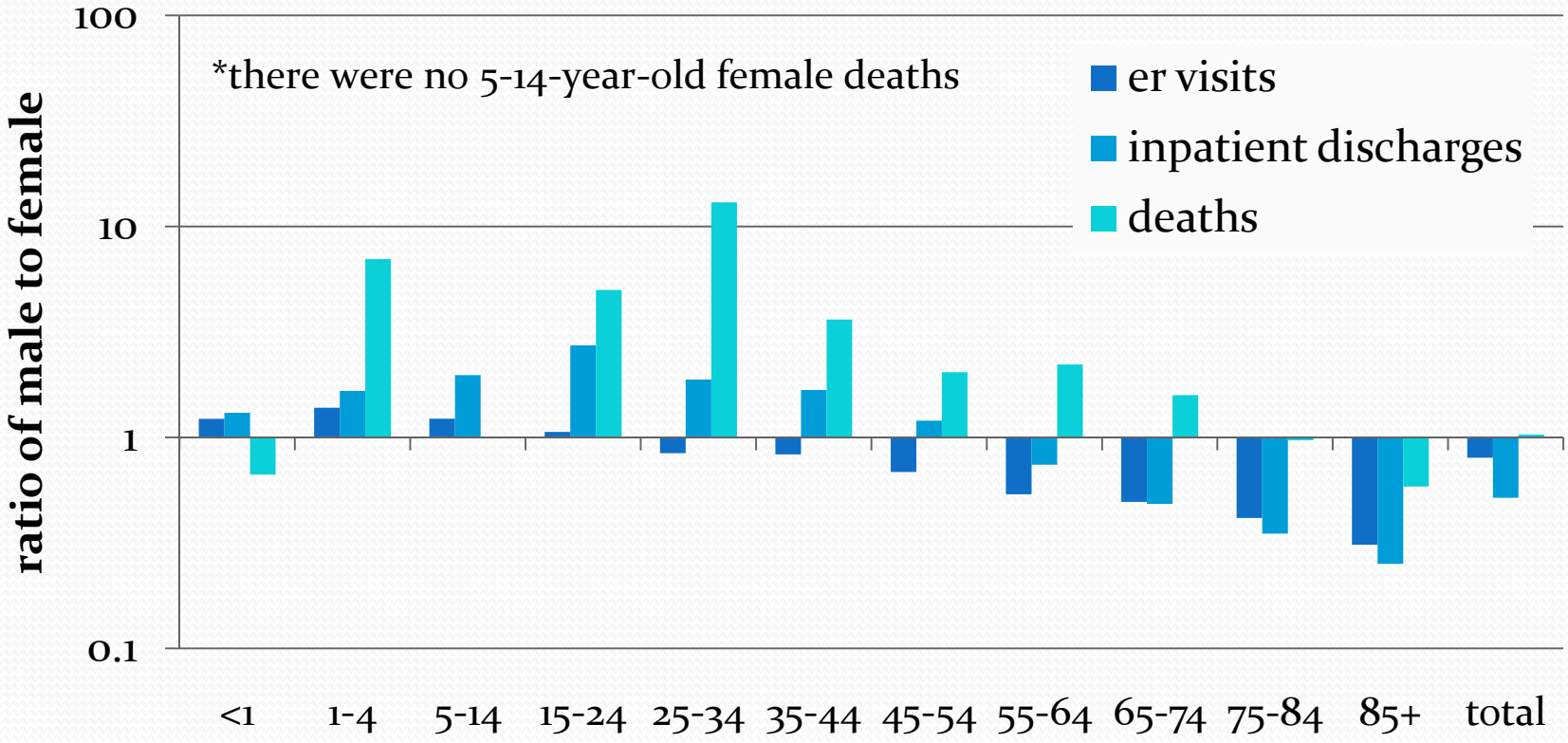
Disproportionate Burden Among Older Adults and Gender Comparisons

Proportional distribution of Ohio population[1], and fall-related ER visits[2], inpatient discharges[2] and deaths[3], by age group, 2005



Proportion by age group

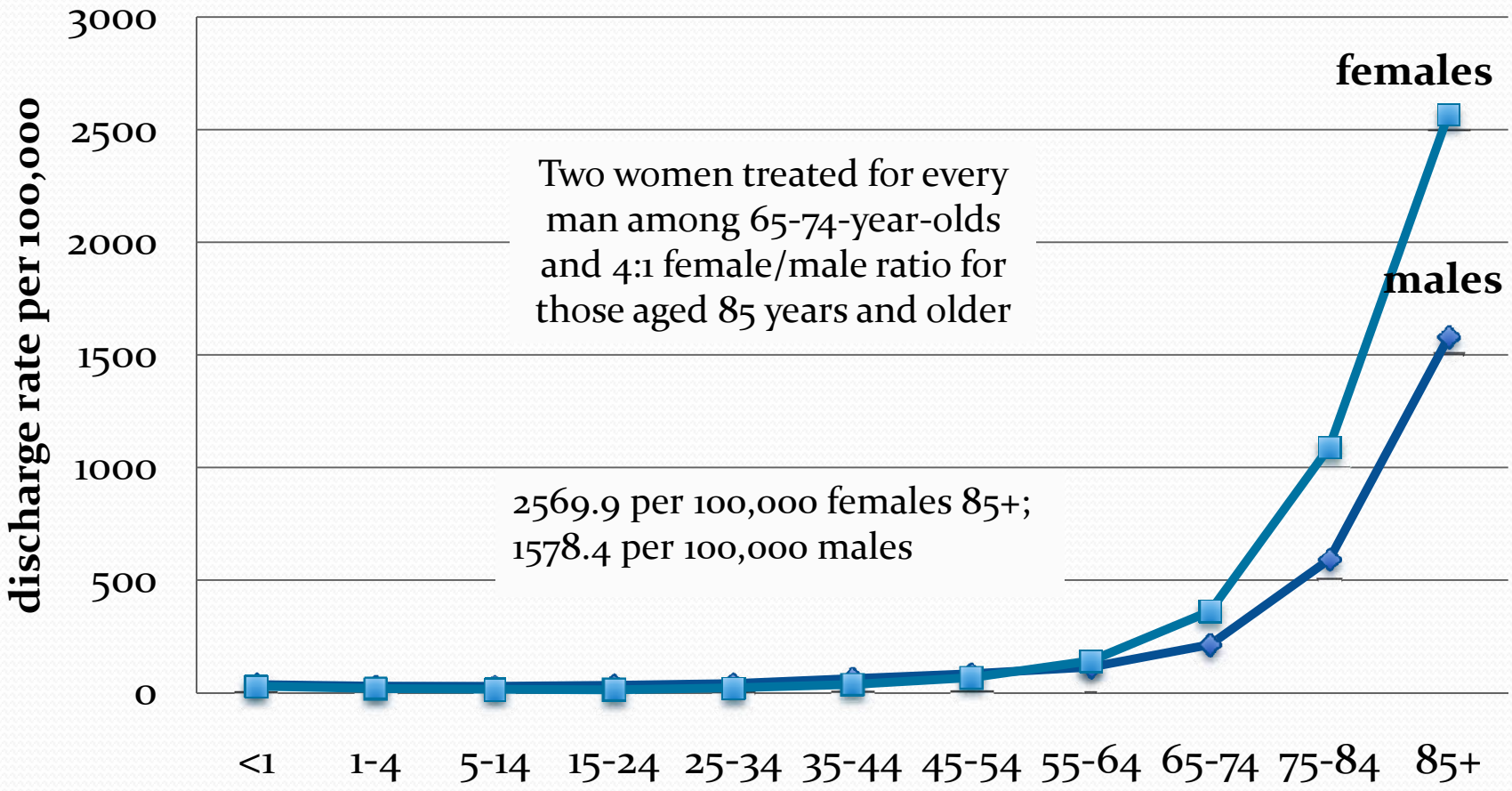
Ratio of male to female fall-related ER visits[1], inpatient discharges[1] and deaths[2], by age group* Ohio, 2002-05



[1]Source: Ohio Hospital Association

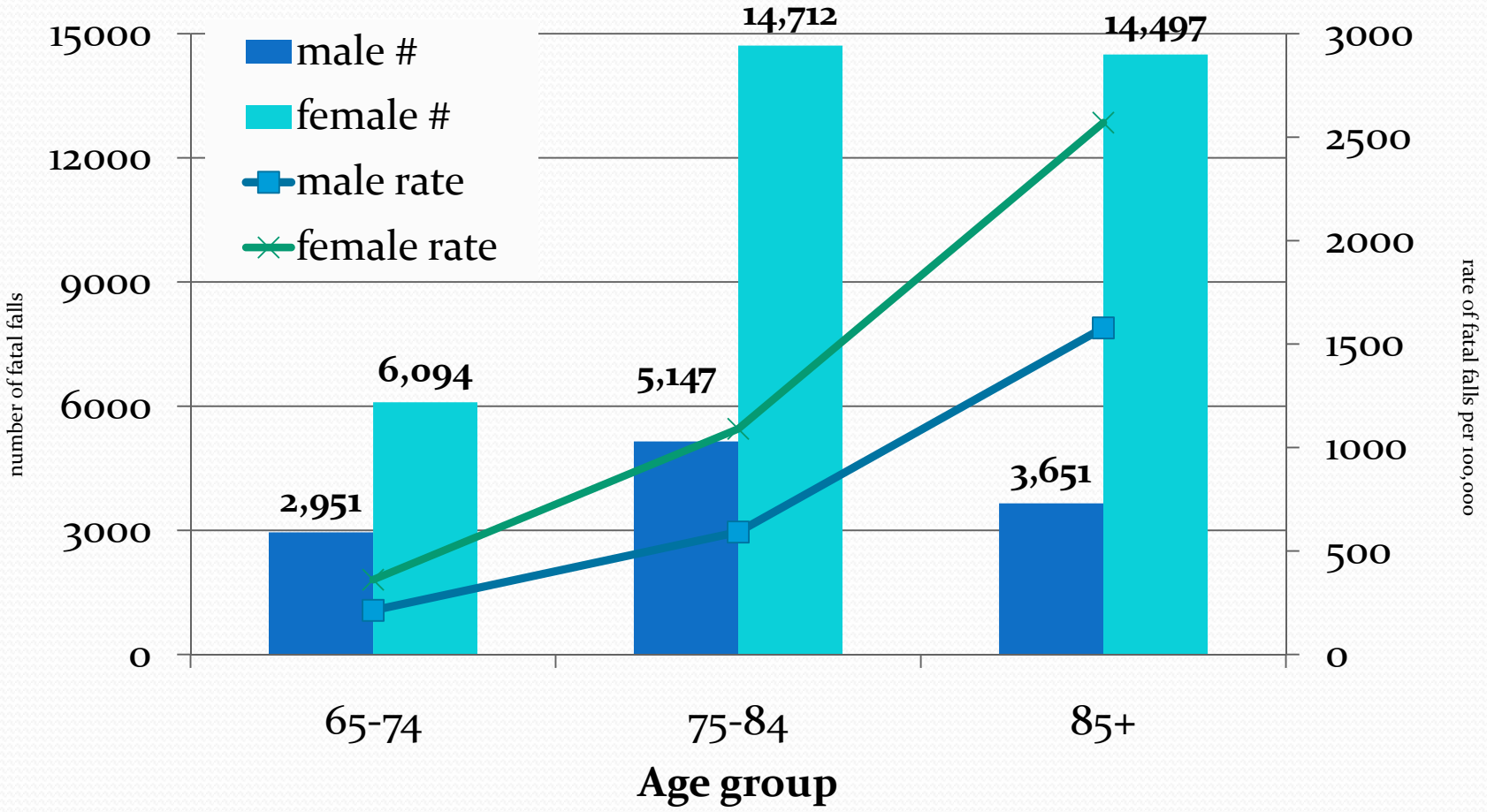
[2]Source: ODH, Office of Vital Statistics

Average annual fall-related inpatient hospitalization[1] rates[2], by age group, sex, Ohio, 2002-05



[1]Source: Ohio Hospital Association [2]per 100,000

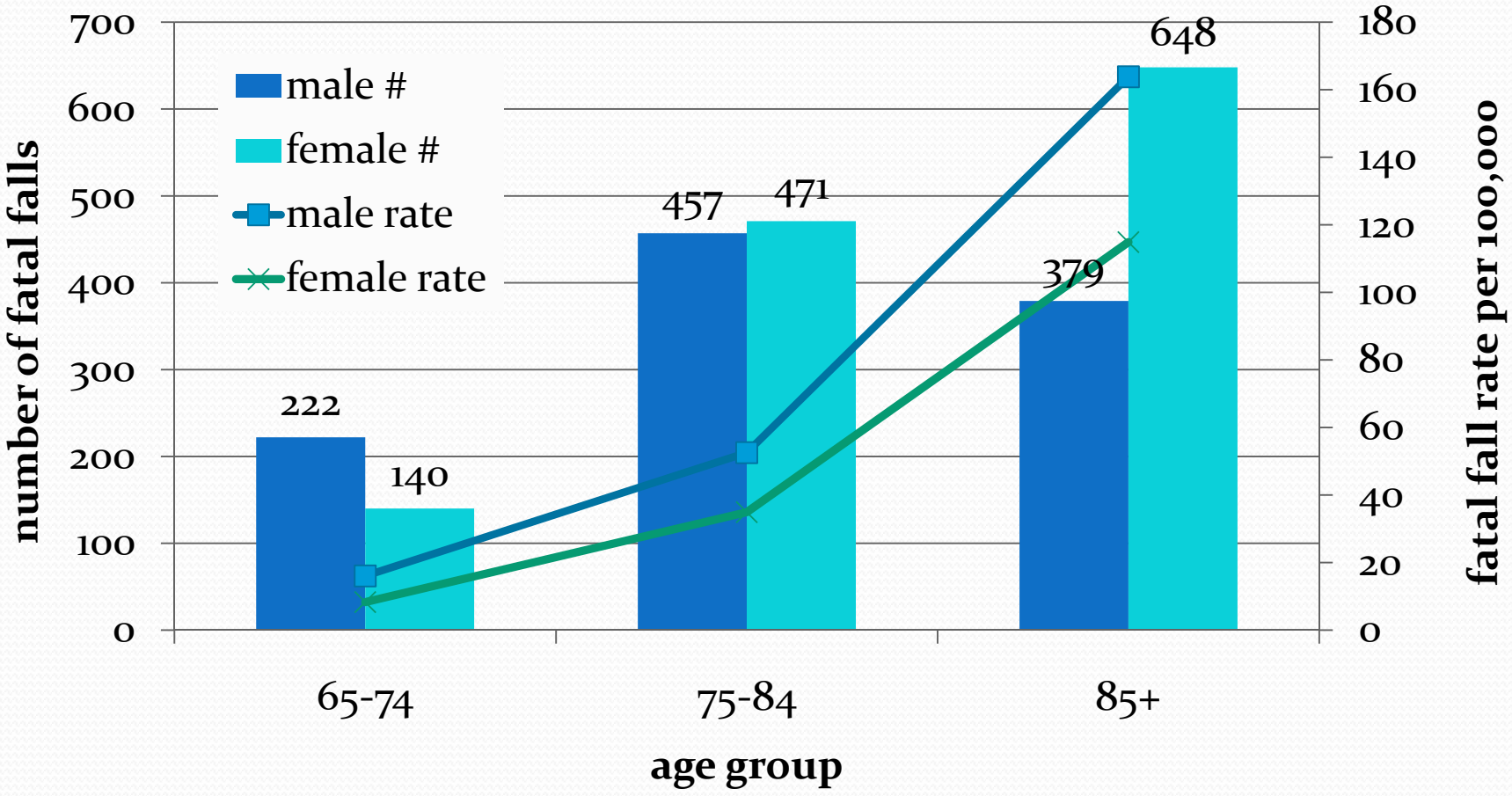
Number and rate[1] of fall-related HIDs[2] by age group, sex, ages 65 and older, Ohio, 2002-05



[1]*per 100,000*

[2]*Source: Ohio Hospital Association*

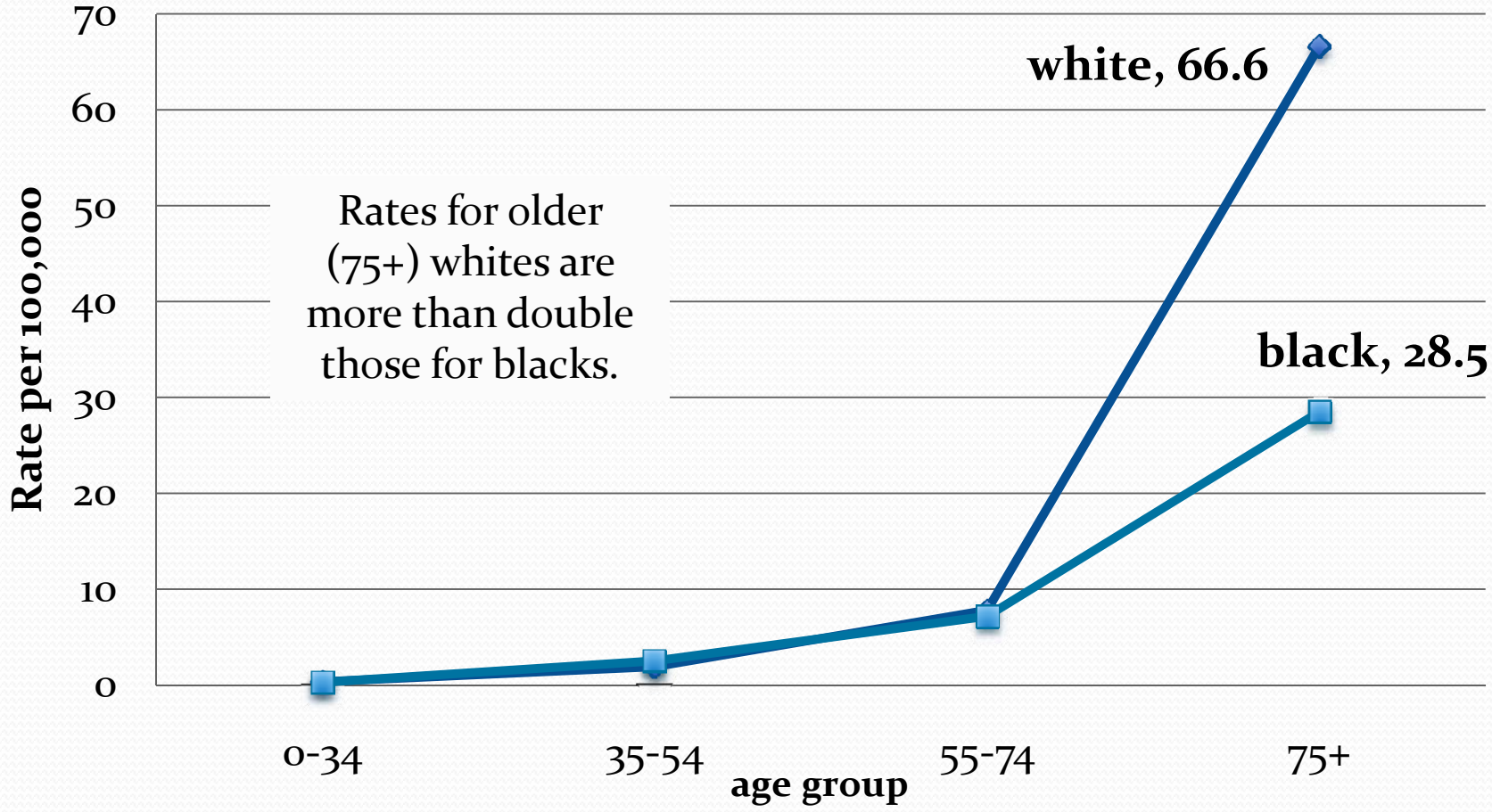
Number and rate[1] of fatal falls[2] by sex, age group, ages 65 and older, Ohio, 2002-05



[1]*per 100,000*

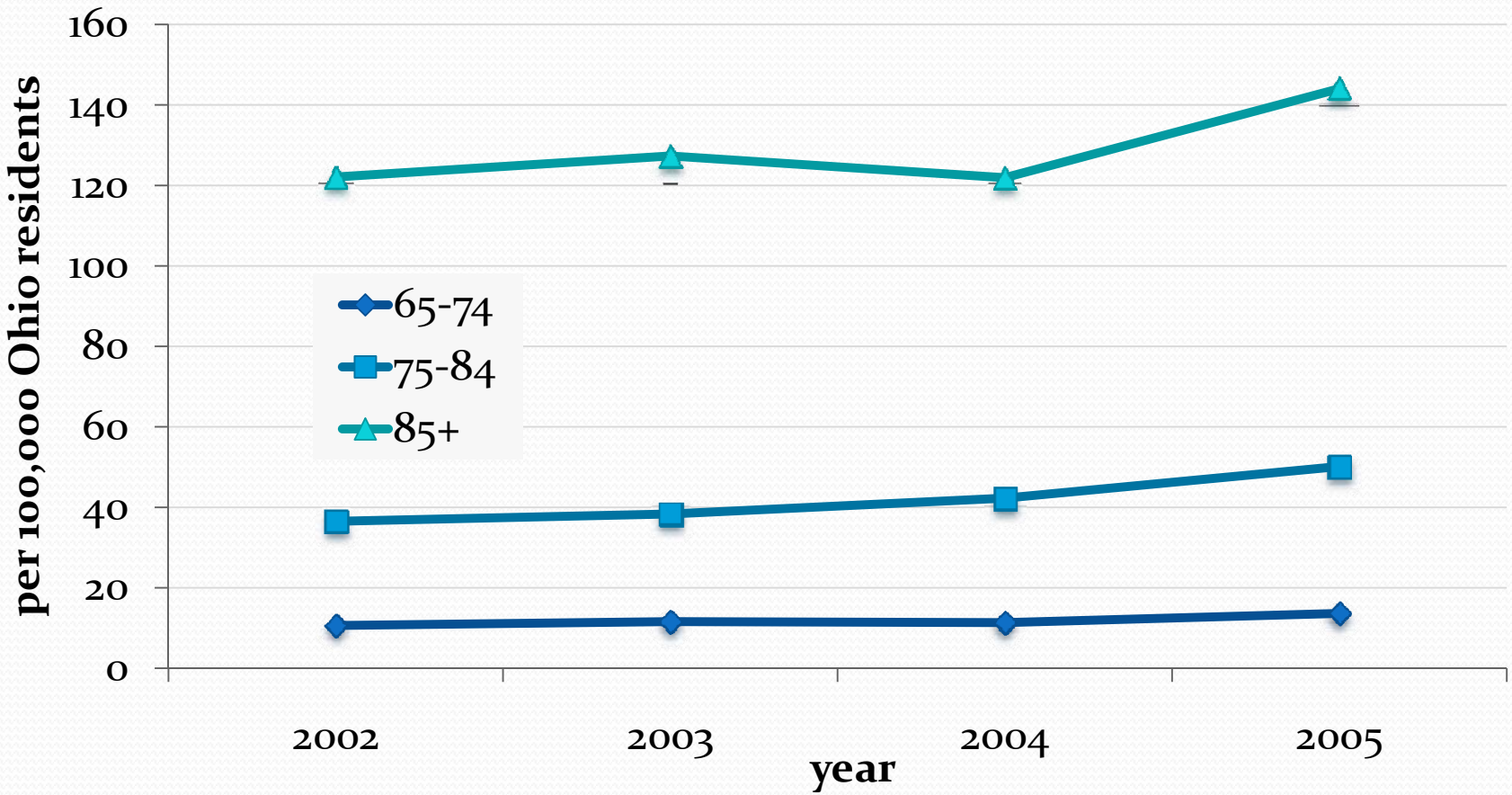
[2]*Source: ODH Office of Vital Statistics*

Average annual fall death rate[1,2], by race, age group, Ohio, 2002-05



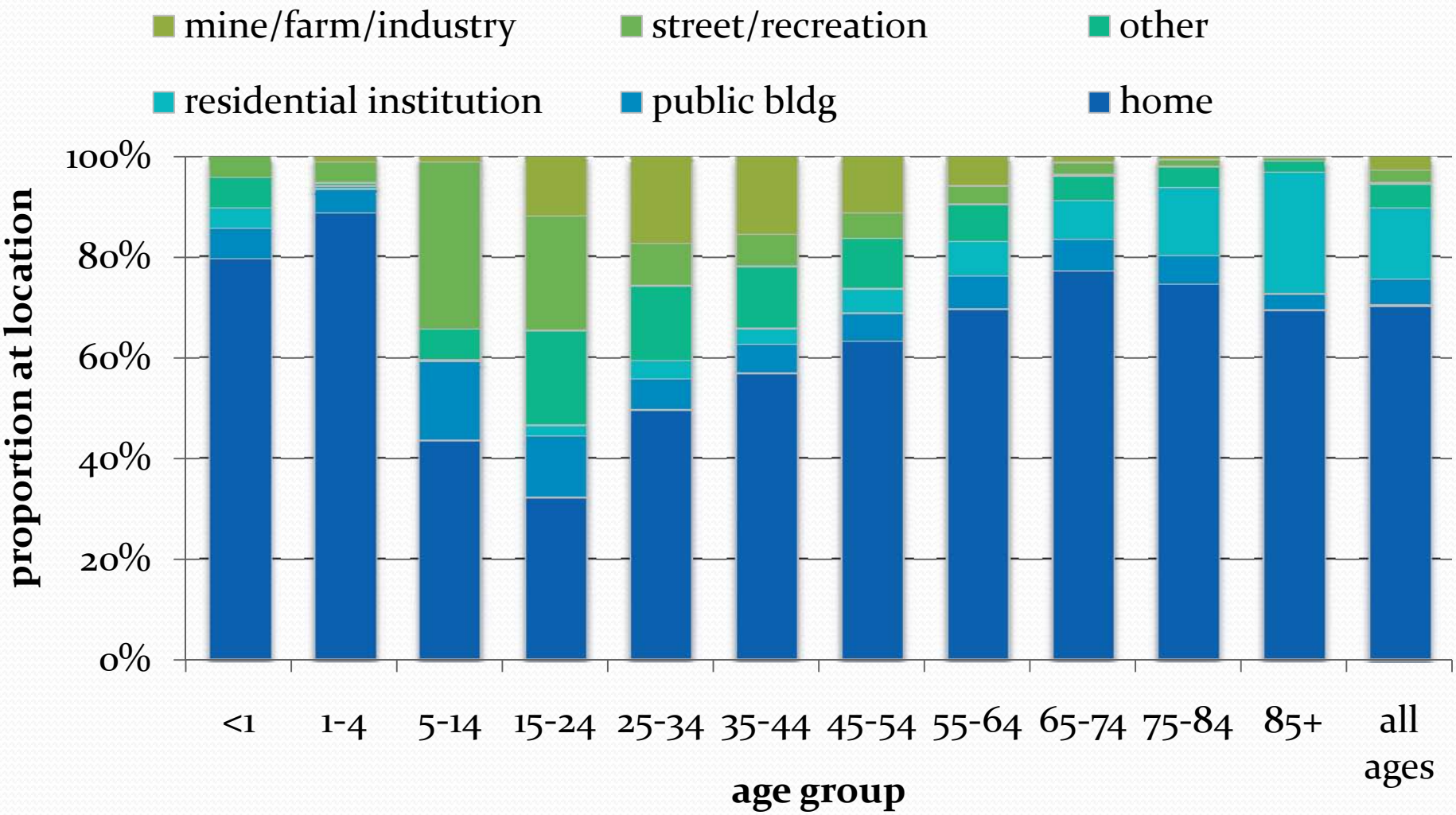
[1]*Source: ODH Office of Vital Statistics*

Fatal fall rates[1,2], by age group, year, ages 65 and older, Ohio, 2002-05



Location and Types of Falls Among Older Adults

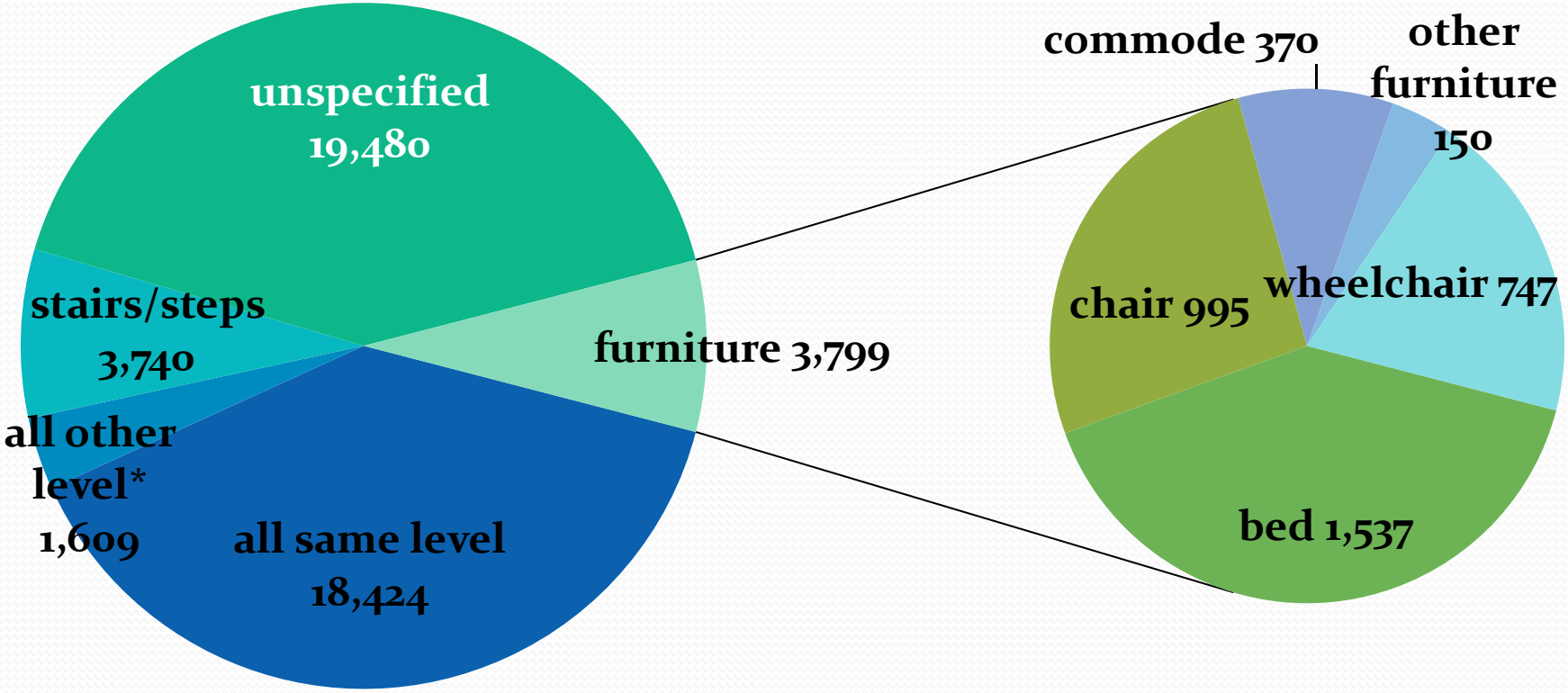
Proportional distribution of location of fall[1] for inpatient dischargees[2], by age group, Ohio, 2002-05



[1]*among those with known location*

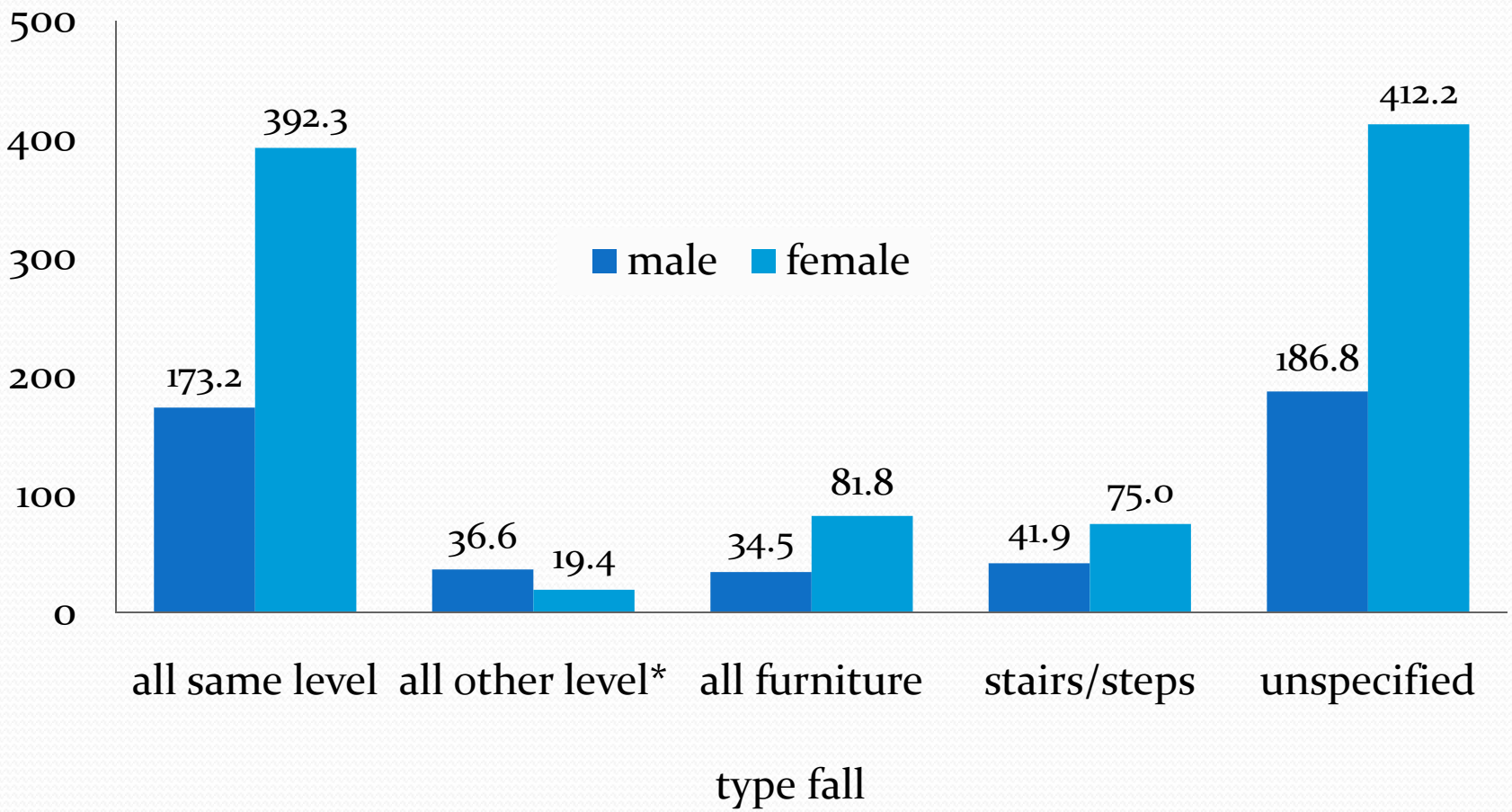
[2]*Source: Ohio Hospital Association*

Proportional distribution of fall-related HIDs[1] by type of fall, ages 65 and older, Ohio, 2002-05



[1]*Source: Ohio Hospital Association*

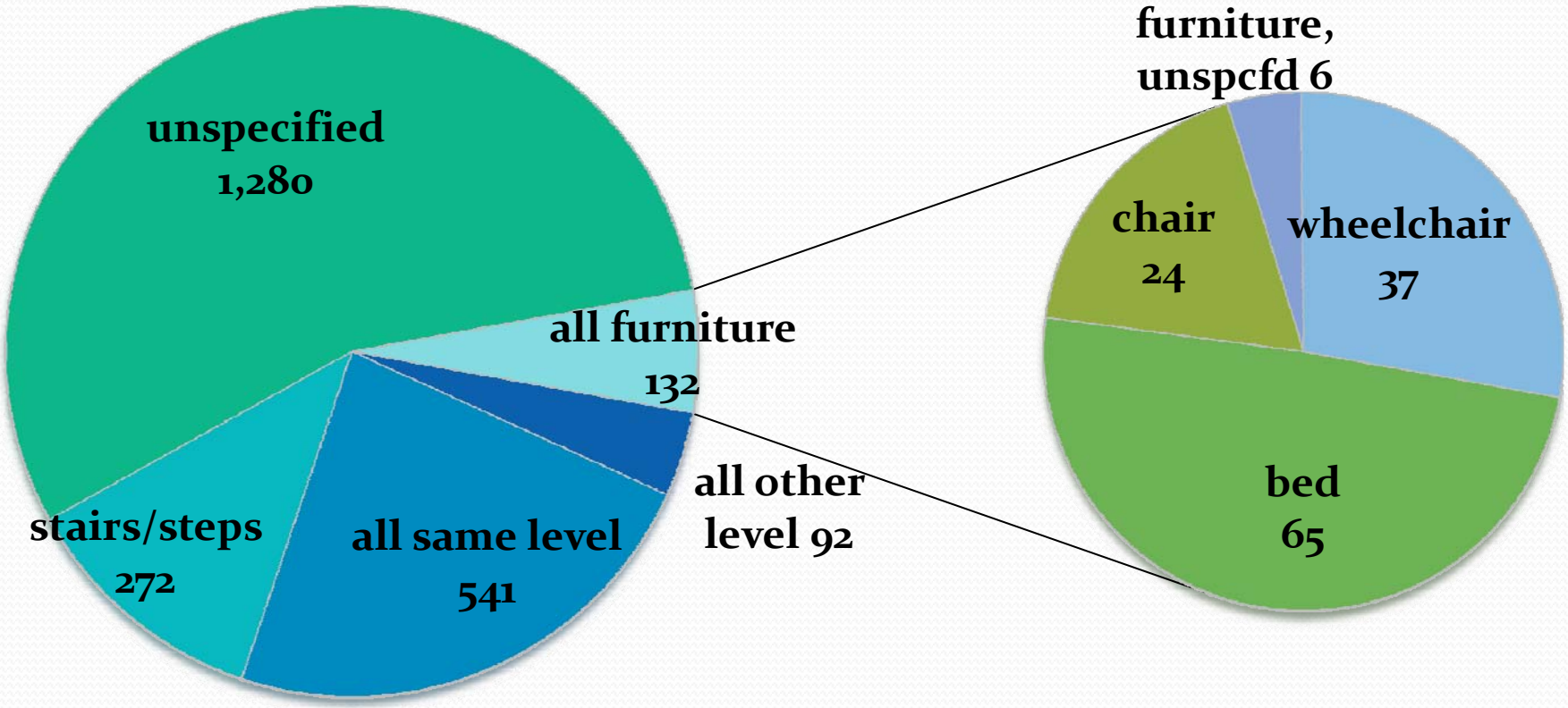
Fall-related HID[1] rates[2] by type of fall, ages 65 and older, Ohio, 2002-05



[1]*per 100,000*

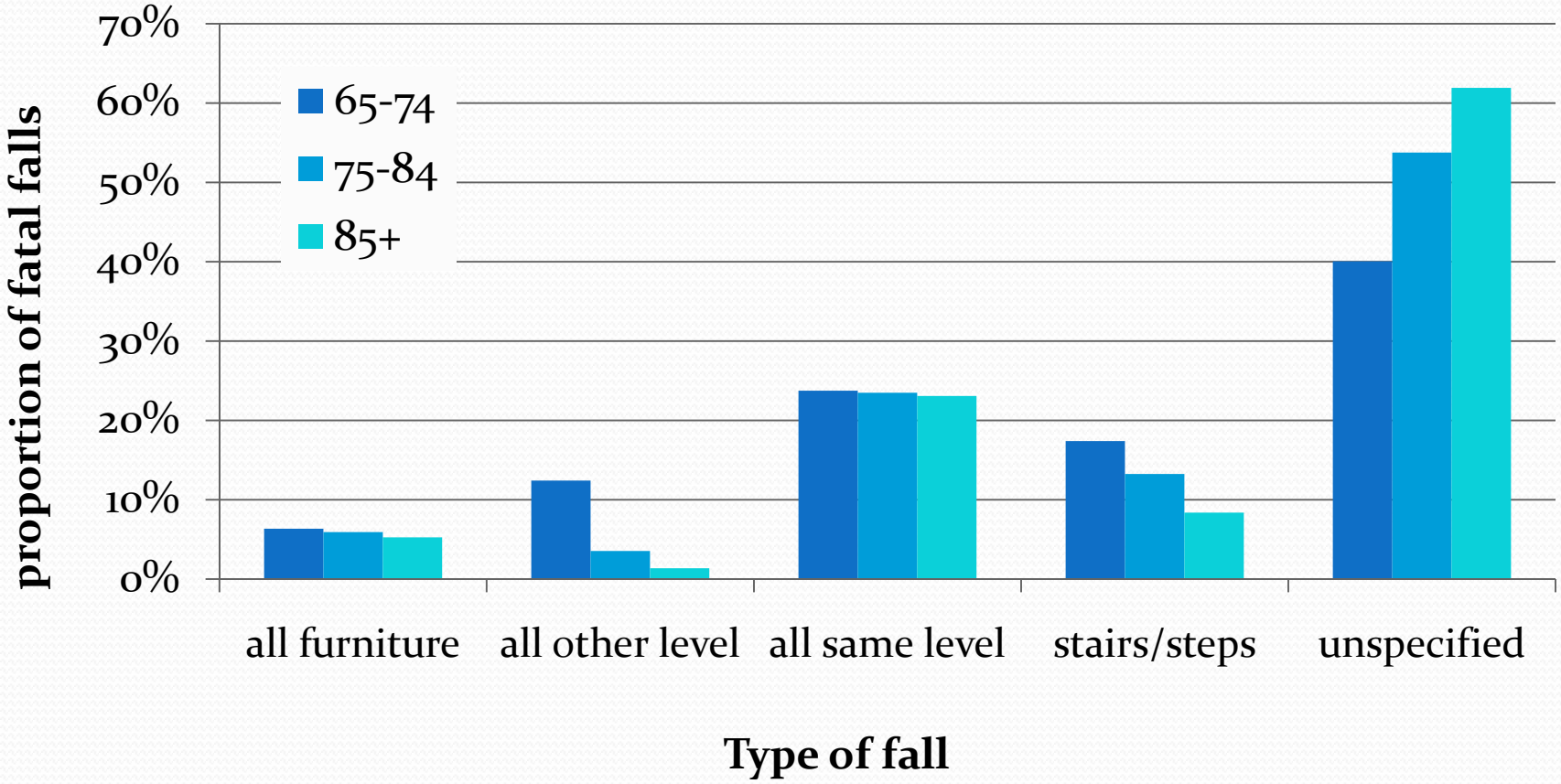
[2]*Source: ODH Office of Vital Statistics*

Proportional distribution and number of fatal falls[1] by type of fall, ages 65 and older, Ohio, 2002-05



[1]Source: ODH Office of Vital Statistics

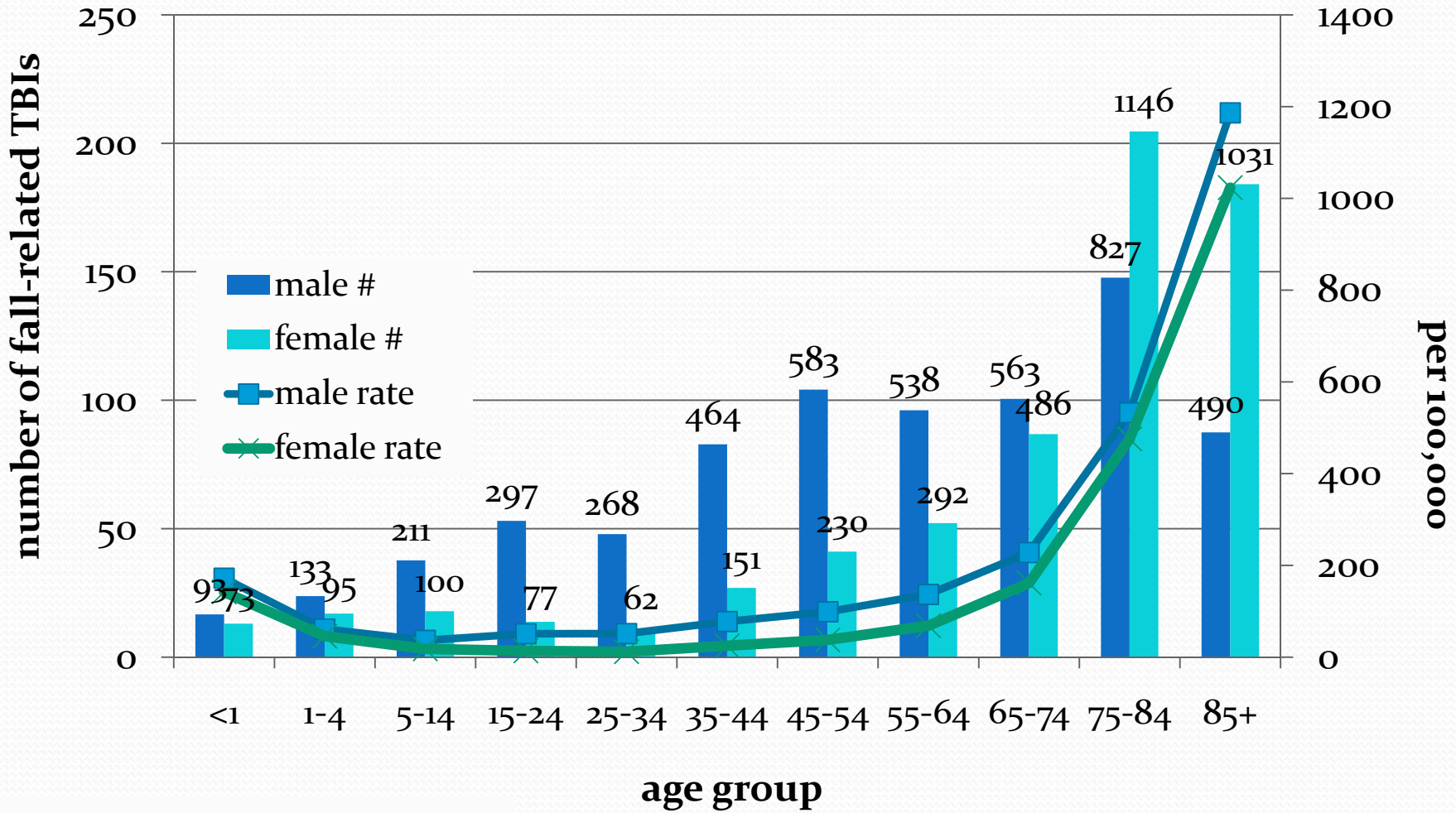
Proportional distribution of fatal falls[1] by type of fall, age group, 65 and older, Ohio, 2002-05



[1]*Source: ODH Office of Vital Statistics*

Fall-related Injuries and Consequences/Severity among Older Adults

Number and rate[1] of fall- and TBI[2]-related HIDs[3] by age group, sex, Ohio, 2002-05

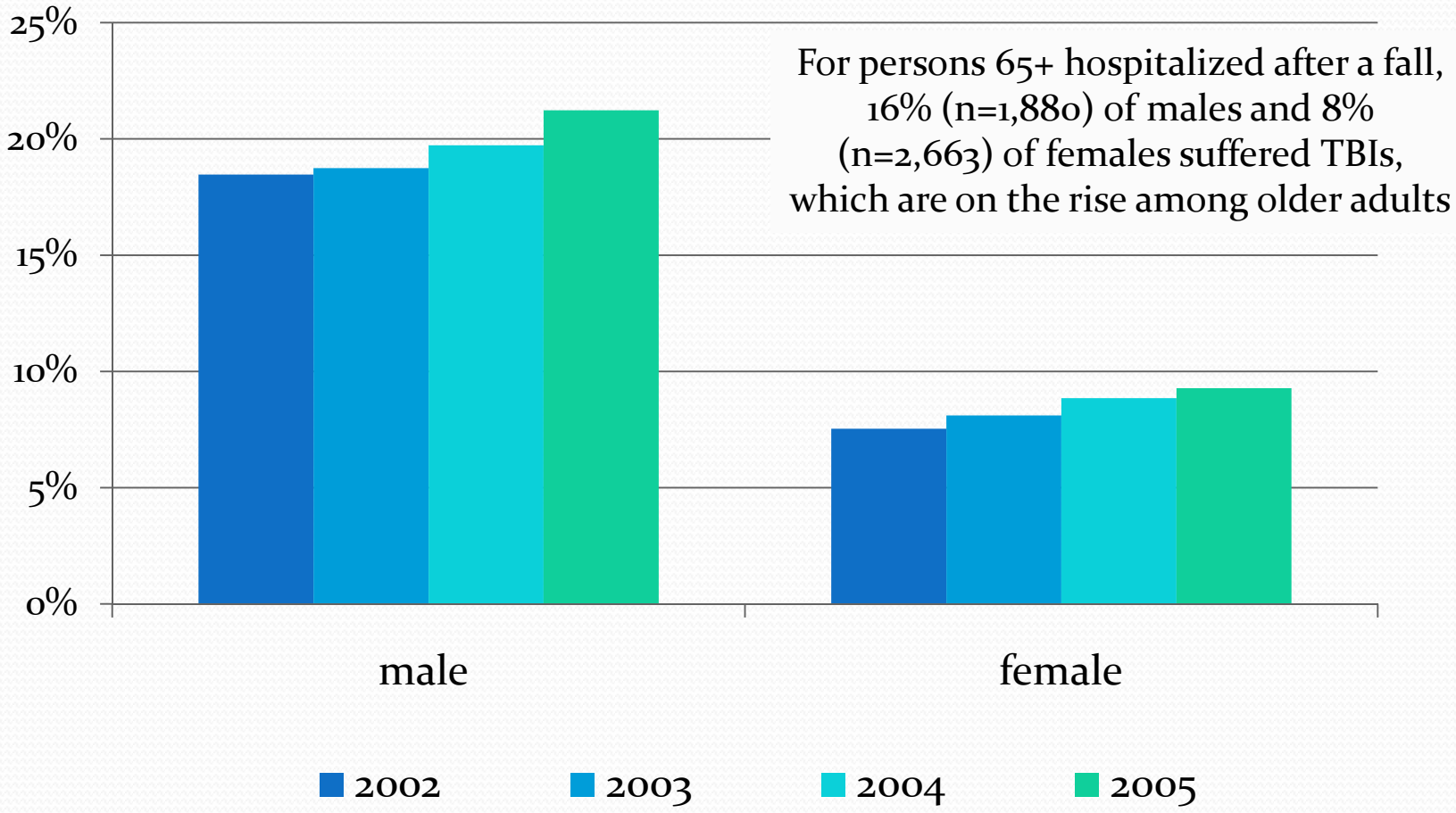


[1]*per 100,000*

[2]*traumatic brain injury*

[3]*Source: Ohio Hospital Association*

Proportion of fall-related discharges who suffered a TBI*, by gender, year, 2002-05

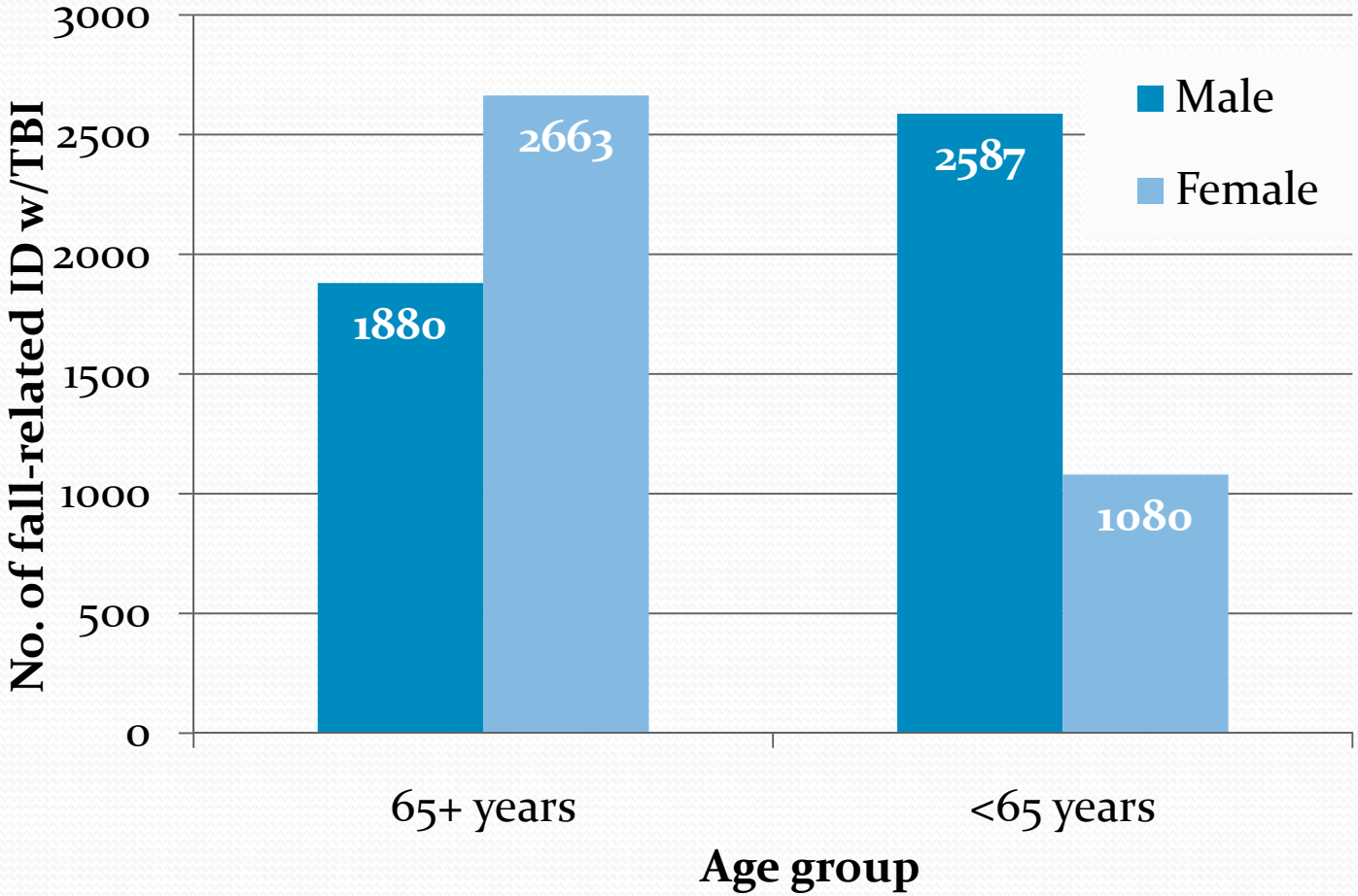


[1]Source: Ohio Hospital Association

* traumatic brain injury

No. of fall-related HID with TBI* of Ohio residents, by sex, age group, 2002-2005

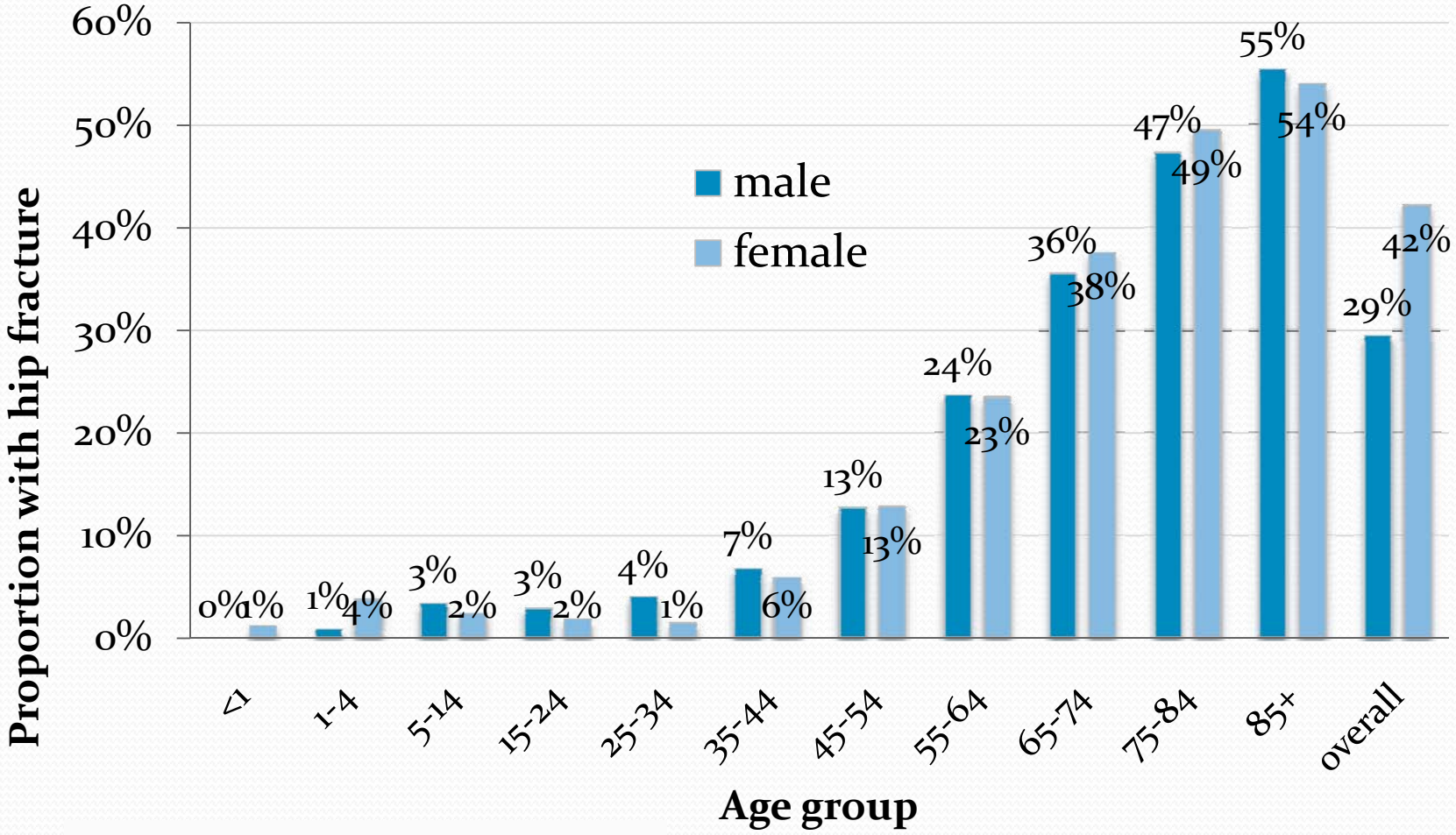
4,543 Ohioans aged 65+ were diagnosed with a fall-related TBI. - 50% of the fall-related IH with TBI



[1]Source: Ohio Hospital Association

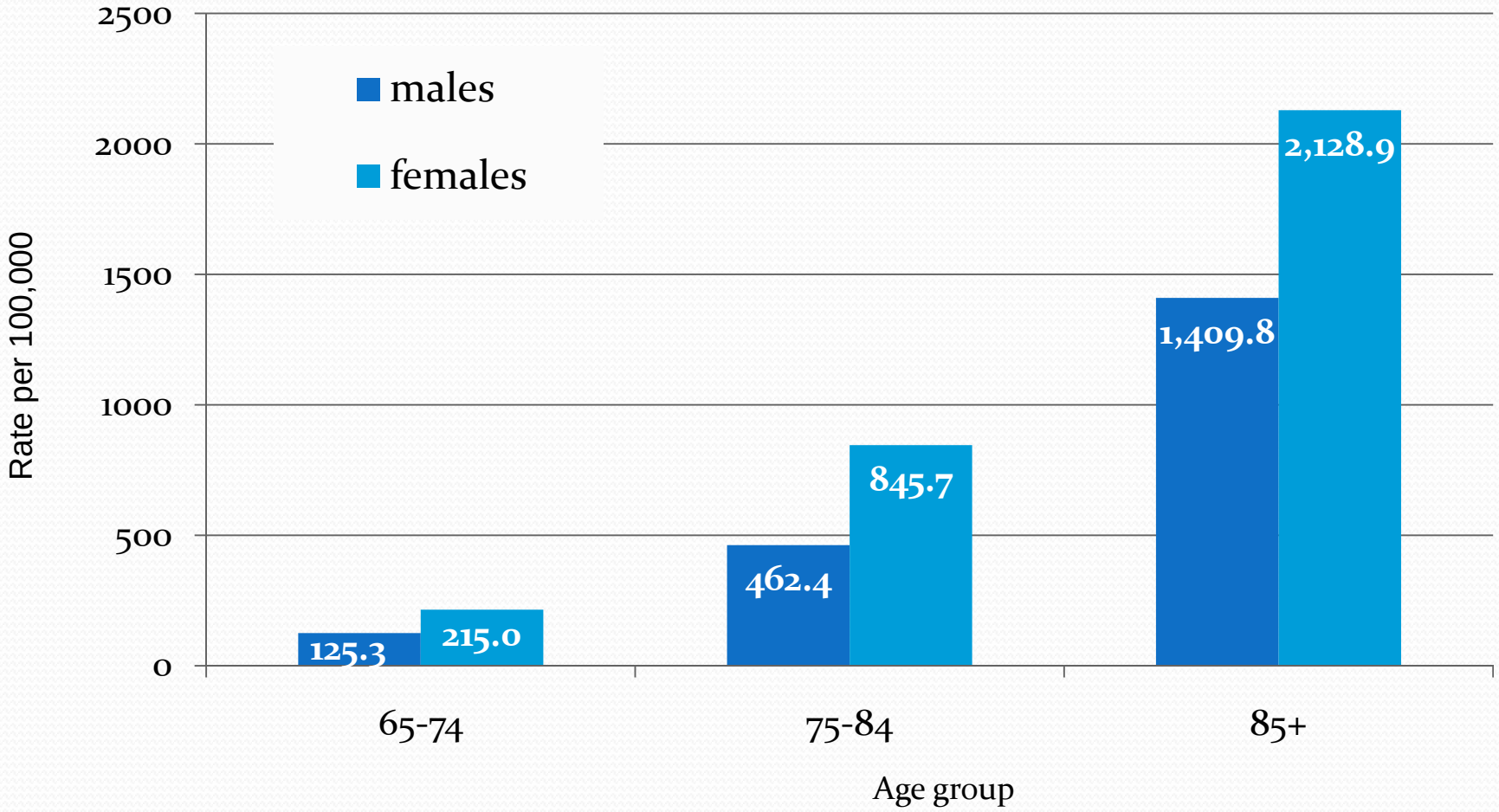
*traumatic brain injury

Proportion of discharged fallers[1] who suffered a hip fracture, by age group, sex, Ohio, 2002-05



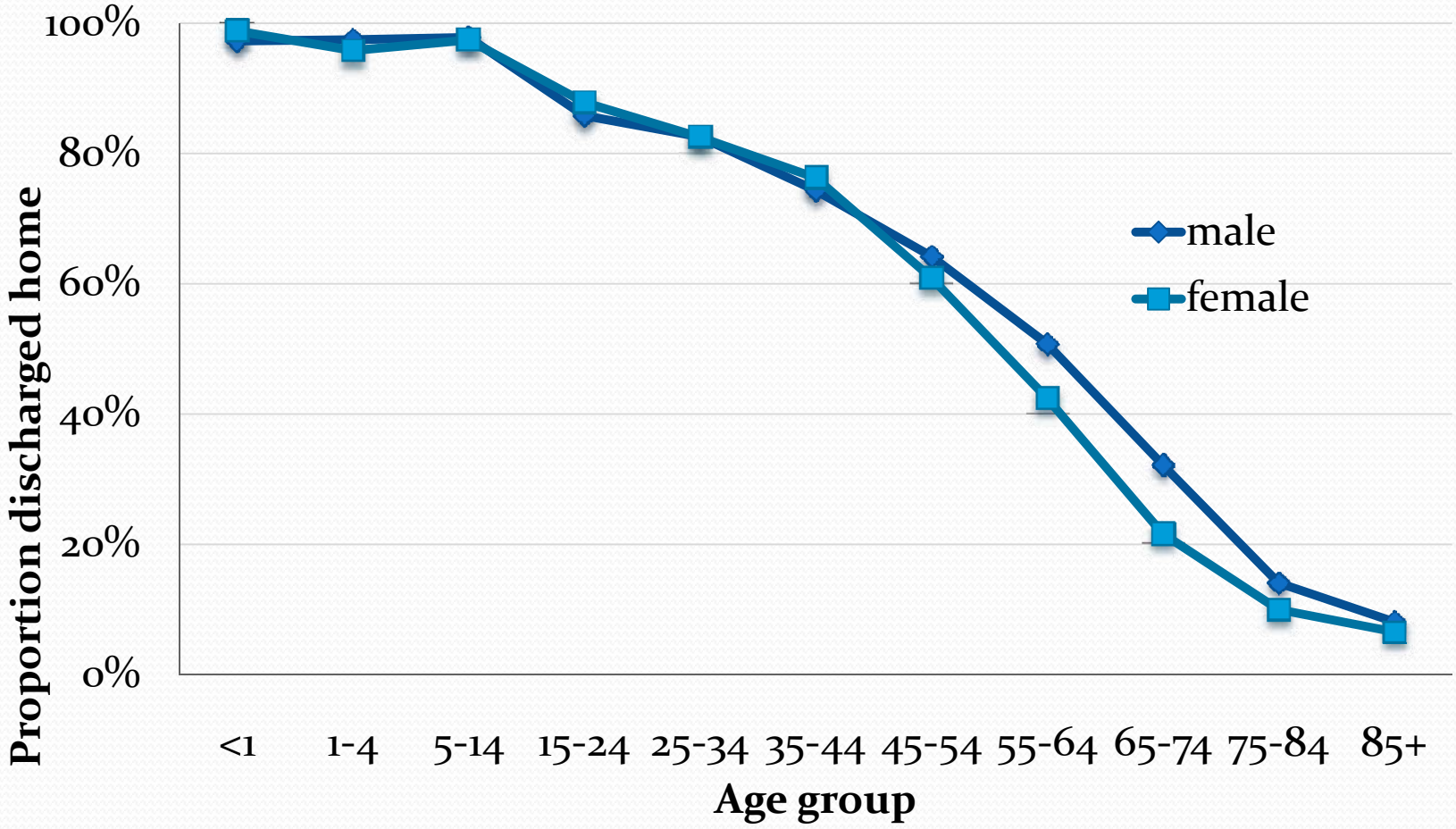
[1]Source: Ohio Hospital Association

Average annual hip fracture rate (per 100,000 Ohioans), by age group, gender, 65 or older, 2002-05



[1]Source: Ohio Hospital Association

Proportion of fall-related inpatients[1] who were discharged home without further treatment[2], by age group, sex, Ohio, 2002-05

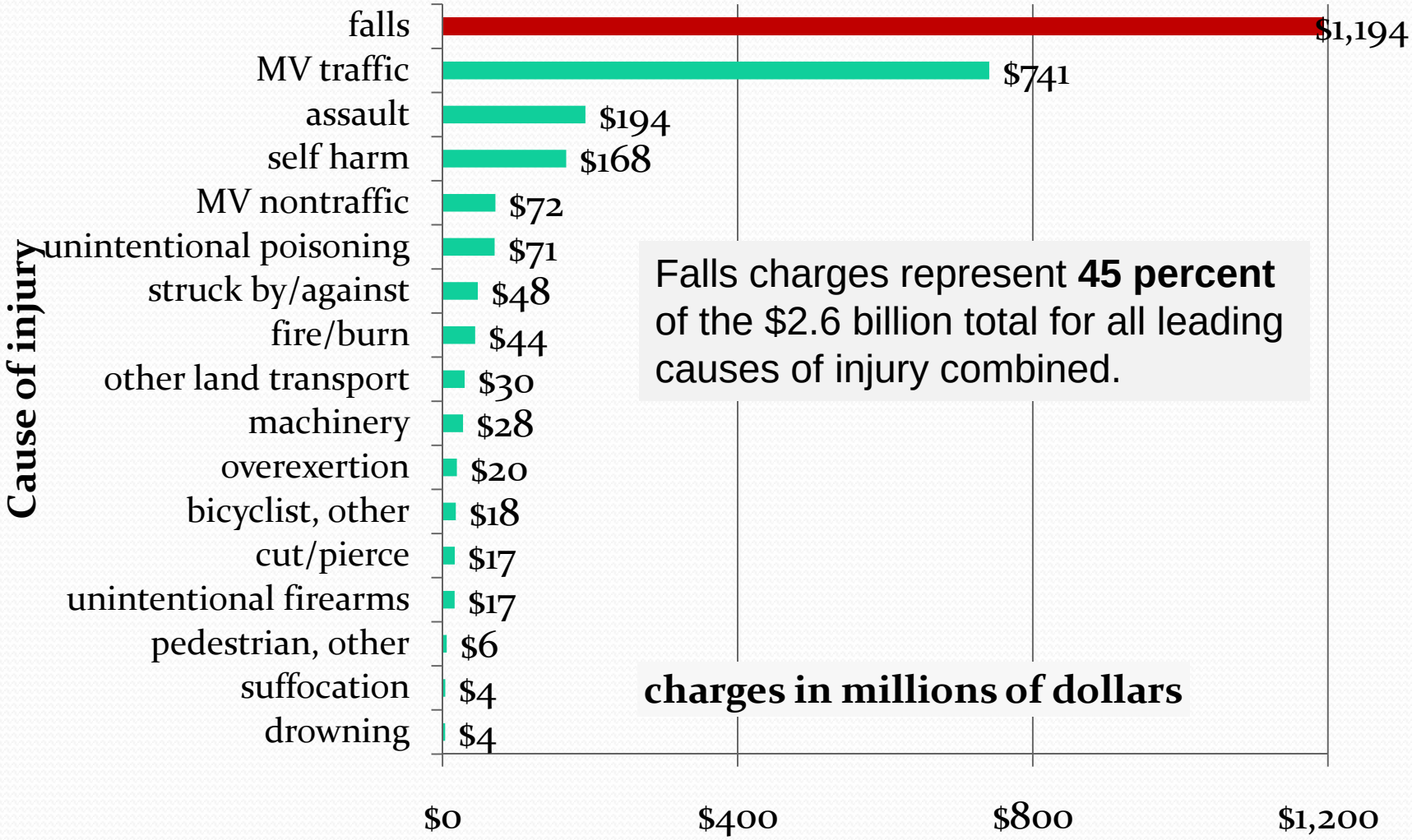


[1]*Source: Ohio Hospital Association*

[2]*vs. died/assigned hospice, additional care, AMA*

Costs of Fall-related Injury

Total charges (in millions) for inpatient treatment[1] of leading causes of injury, by type of injury, Ohio, 2002-05



[1]*Source: Ohio Hospital Association*

Average Annual Cost of Non-fatal, Hospital-admitted Falls Among Older Adults, Ages 65+ Ohio, 2003[1,2]

	65+ yrs Total	Percent of All
Incidence	19,137	71%
Medical	$ 327,366,900	67%
Work-Loss	$ 116,513,800	22%
Quality-of-Life	$ 3,728,623,600	72%
Total Costs	$ 4,172,504,300	68%
Proportion of Ohio Population		13%

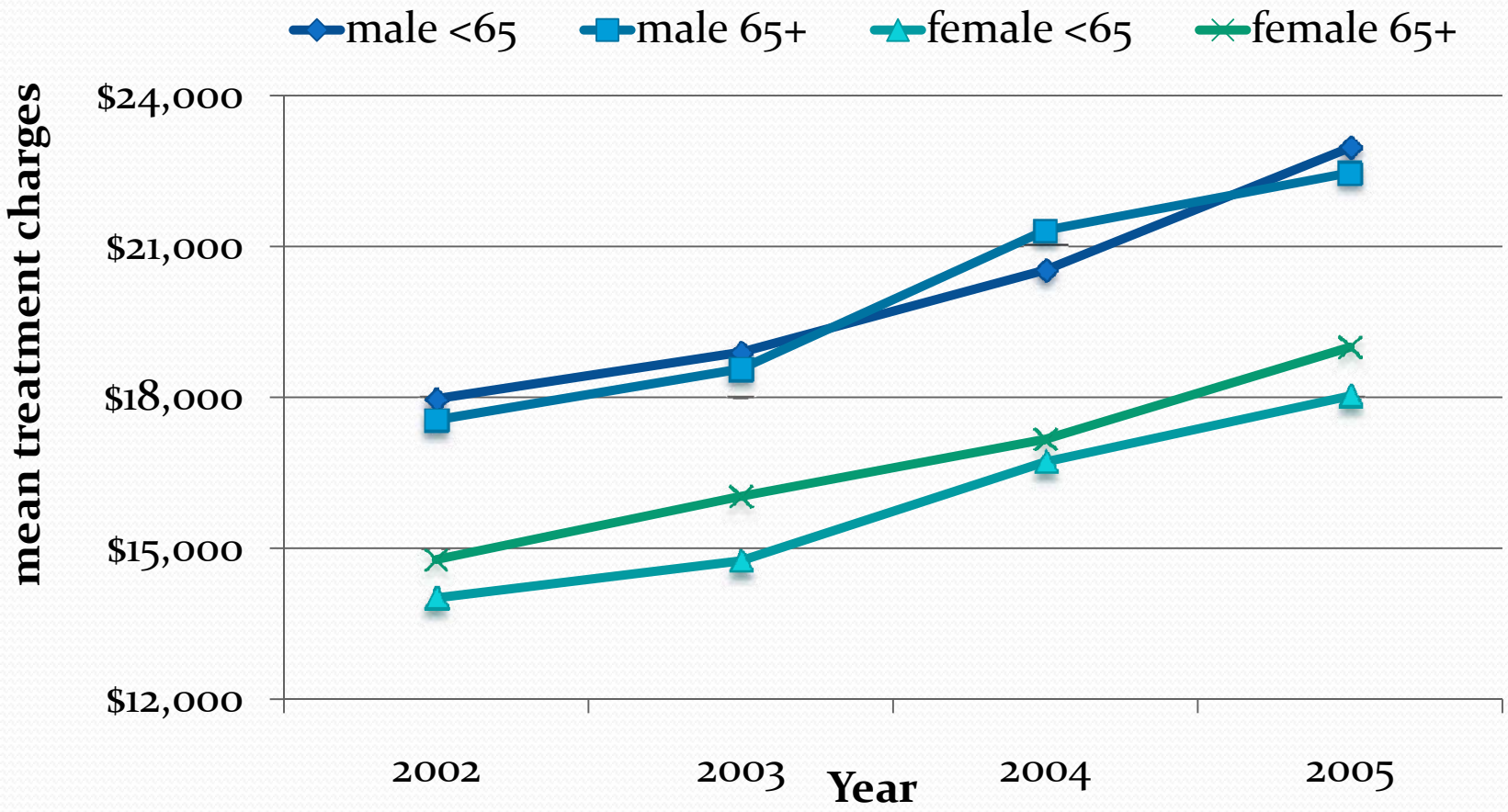
[1]Source: Children's Safety Network Economics & Data Analysis Resource Center

Average Annual Cost of Fatal Falls Among Older Adults, Ohio, 2005-07[1,2]

	65+ Total	Percent of All
Incidence	751 (average)	82%
Medical	$15,932,826	77%
Work-loss	$52,419,892	20%
Quality of Life	$456,477,719	53%
Total Costs	$524,830,437	46%
Proportion of Ohio Population >65 years		13%

[1]Source: Children's Safety Network Economics & Data Analysis Resource Center, [2]ODH Office of Vital Statistics

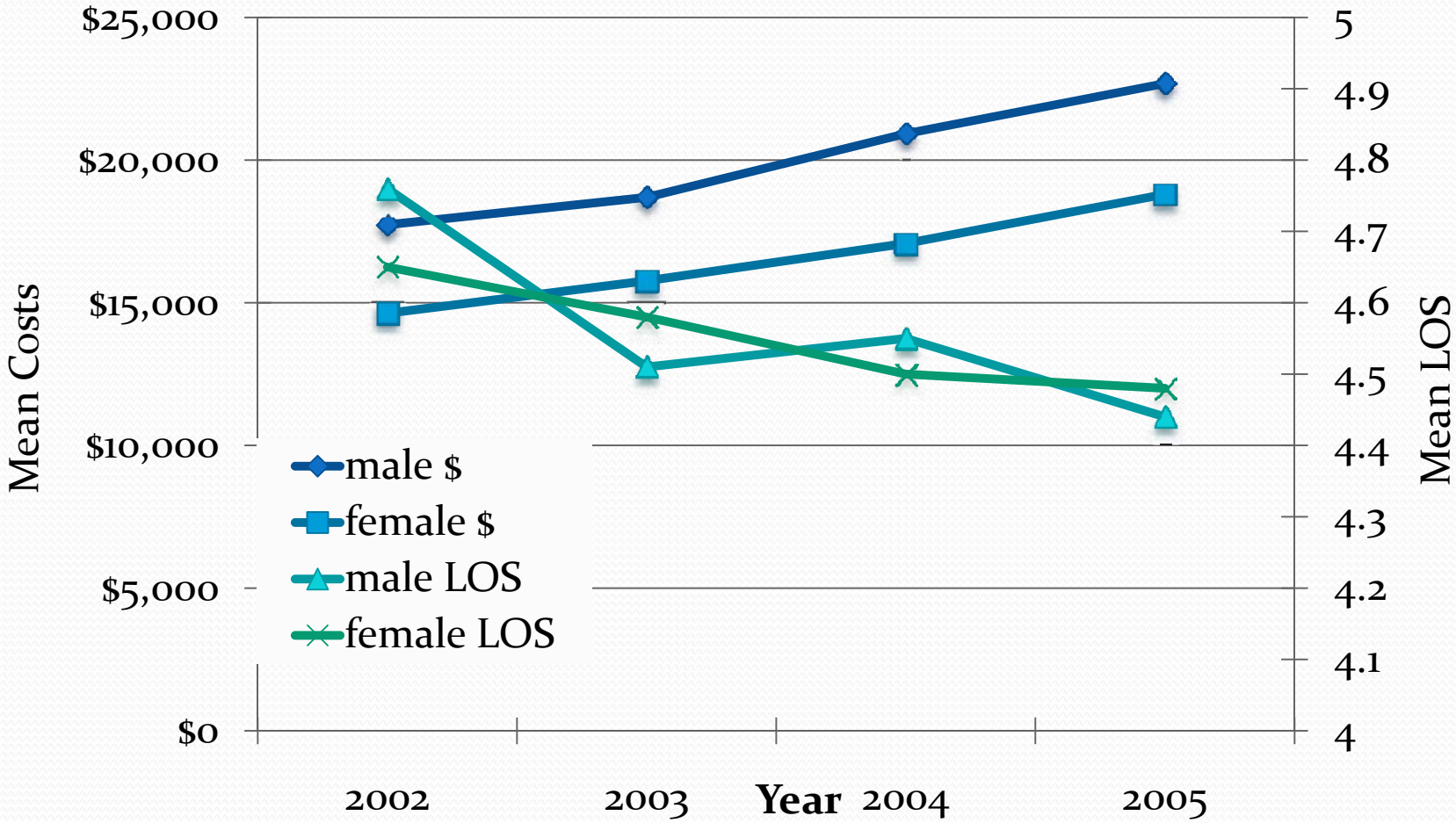
Mean charges[1] of inpatient treatment for a fall,[2] by 64 or younger versus 65 or older, sex, year, Ohio, 2002-05



[1]*In dollars*

[2]*Source: Ohio Hospital Association*

Mean treatment charges and LOS of fall-related ID of Ohio residents by year, sex, 2002-2005

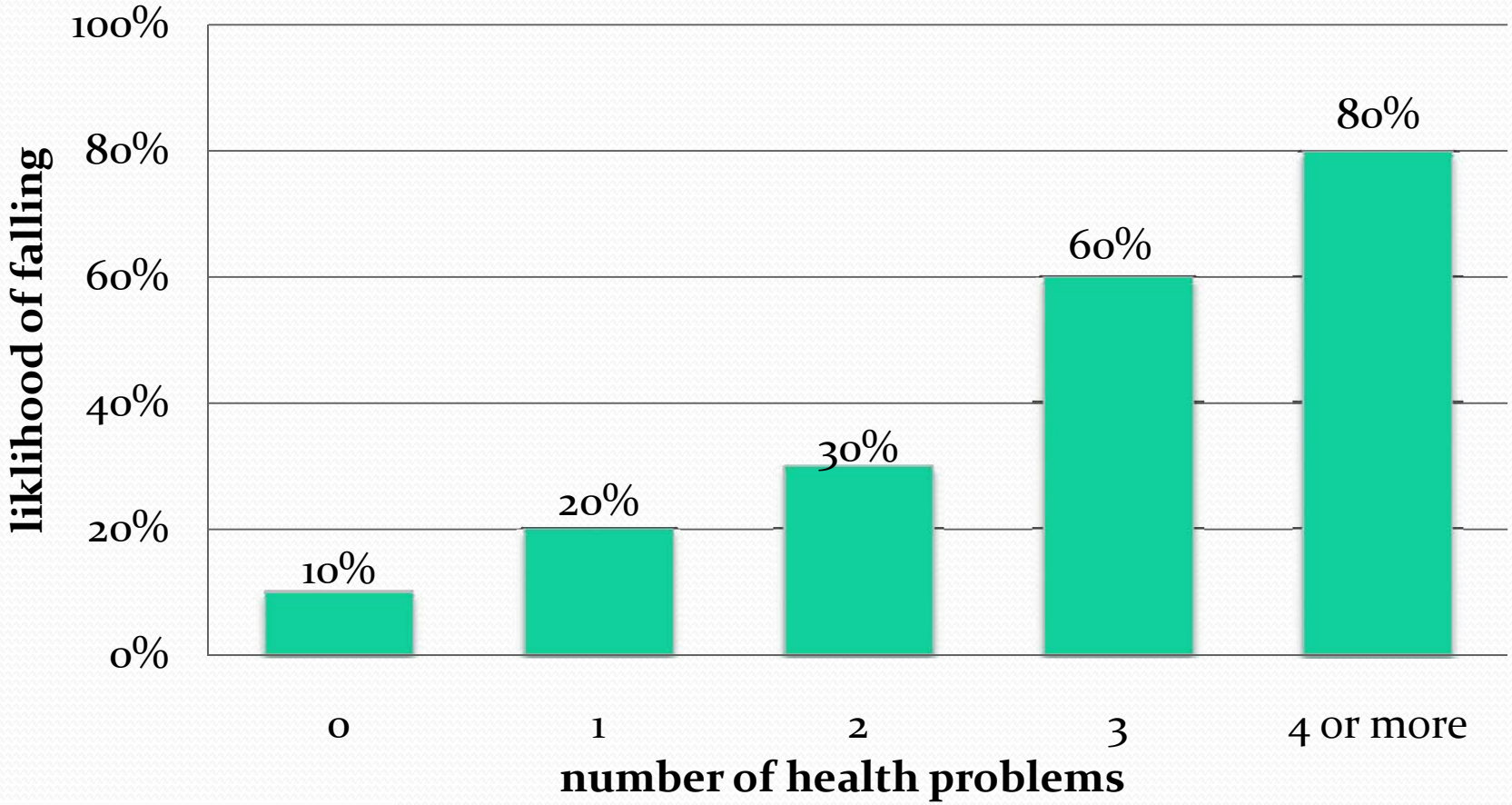


Fall Risk Factors and Self-report Falls Data

Fall Risk Factors

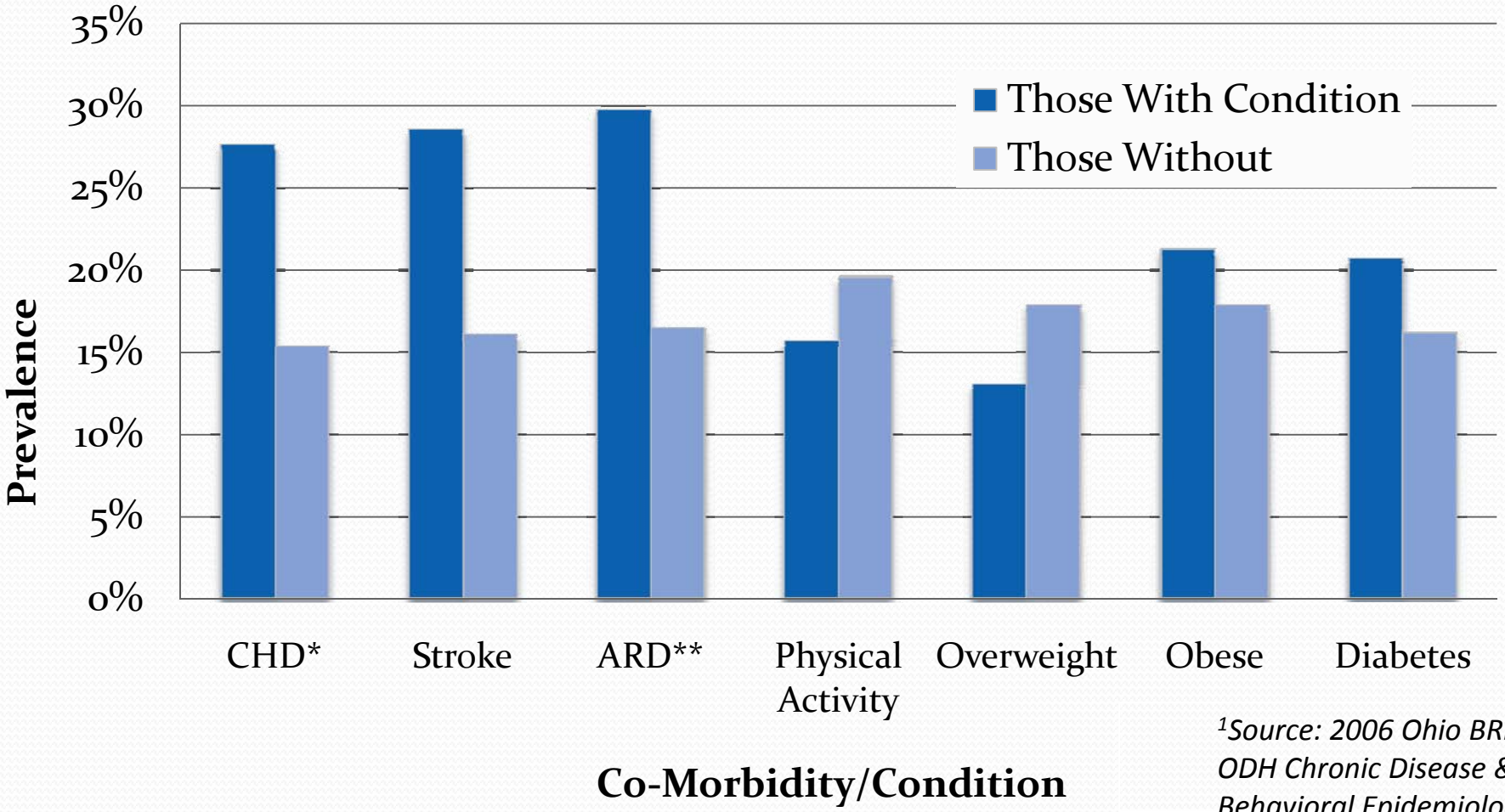
- **Co-morbidities –**
  - Lower limb arthritis,
  - Osteoporosis,
  - Stroke/heart disease,
  - Cancer,
  - Diabetes,
  - Eye diseases
  - other conditions.
- Dizziness.
- Vision problems.
  - Reduced visual cues
- Inappropriate footwear.
- Physical inactivity.
- Impaired balance and coordination.
  - Gait instability, slow walking speed.
- Medication interactions (polypharmacy).
- Impaired cognitive function.
- Use of alcohol/other drugs.
- Hazardous home environment.
- Living alone/social isolation.
- History of previous falls.
- Fear of falling.

Number of health problems and risk for falling among adults age 65 and older[1]



[1]*Source: Tinetti et al.,1988*

Estimated prevalence (%) of falls in the last 3 months among residents age 45 and older with selected co-morbidities and/or conditions, Ohio, 2006[1]



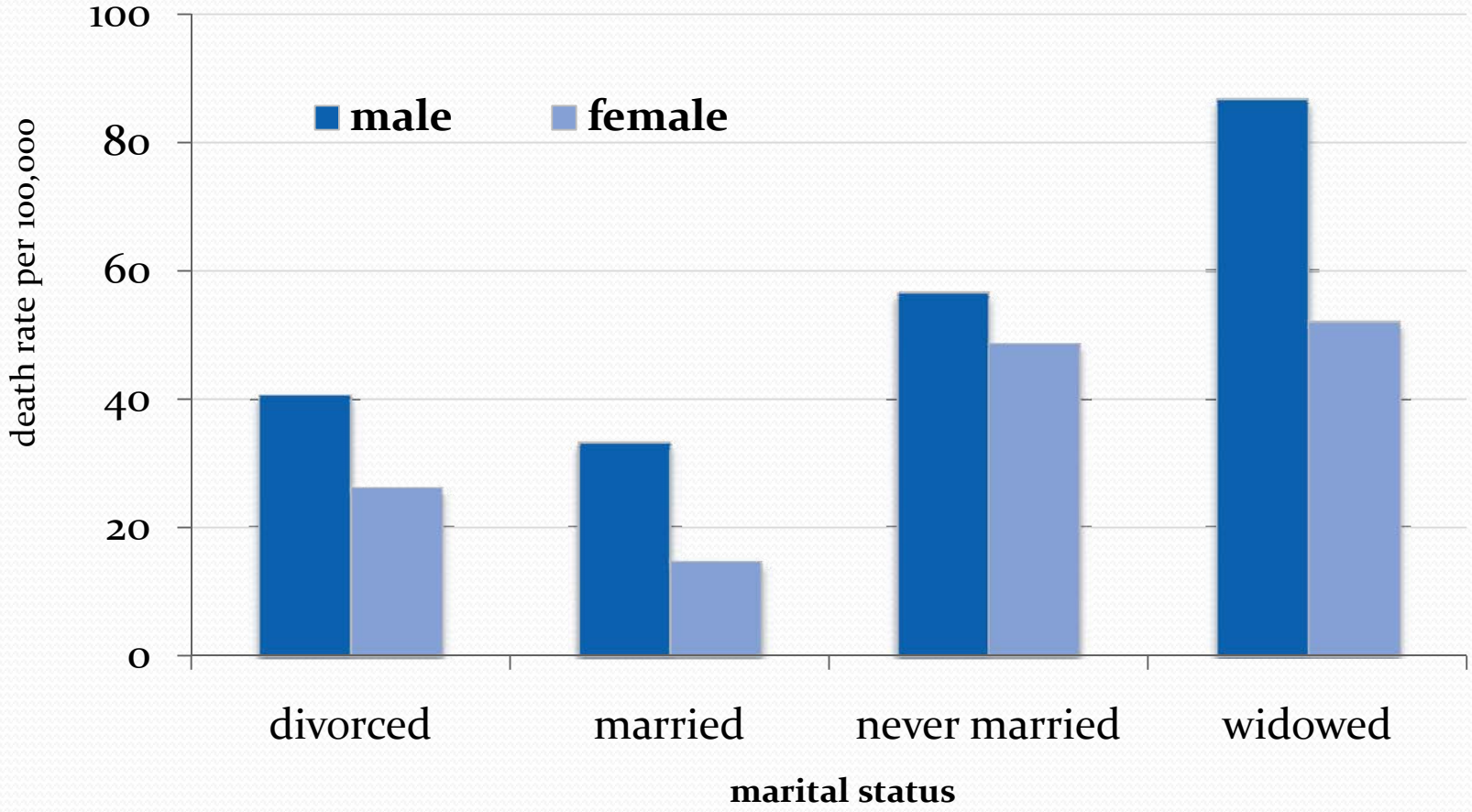
[1]*Source: 2006 Ohio BRFSS, ODH Chronic Disease & Behavioral Epidemiology*

*Coronary heart disease **Age-related eye disease

Estimated prevalence (%) of falls, range and mean number of falls in the past 3 months among those age 45 and older with selected co-morbidities/conditions, Ohio, 2006[1]

Co-Morbidity/Condition	Prevalence of Falls	
	Those With	Those Without
Coronary Heart Disease (CHD)	27.7%	15.4%
Stroke	28.6%	16.1%
Age-related eye disease (ARD)[2]	29.8%	16.5%
Physical Activity (with adequate)	15.7%	19.6%
Overweight	13.9%	17.9%
Obese*	21.3%	17.9%[+]
Diabetes	20.7%	16.2%

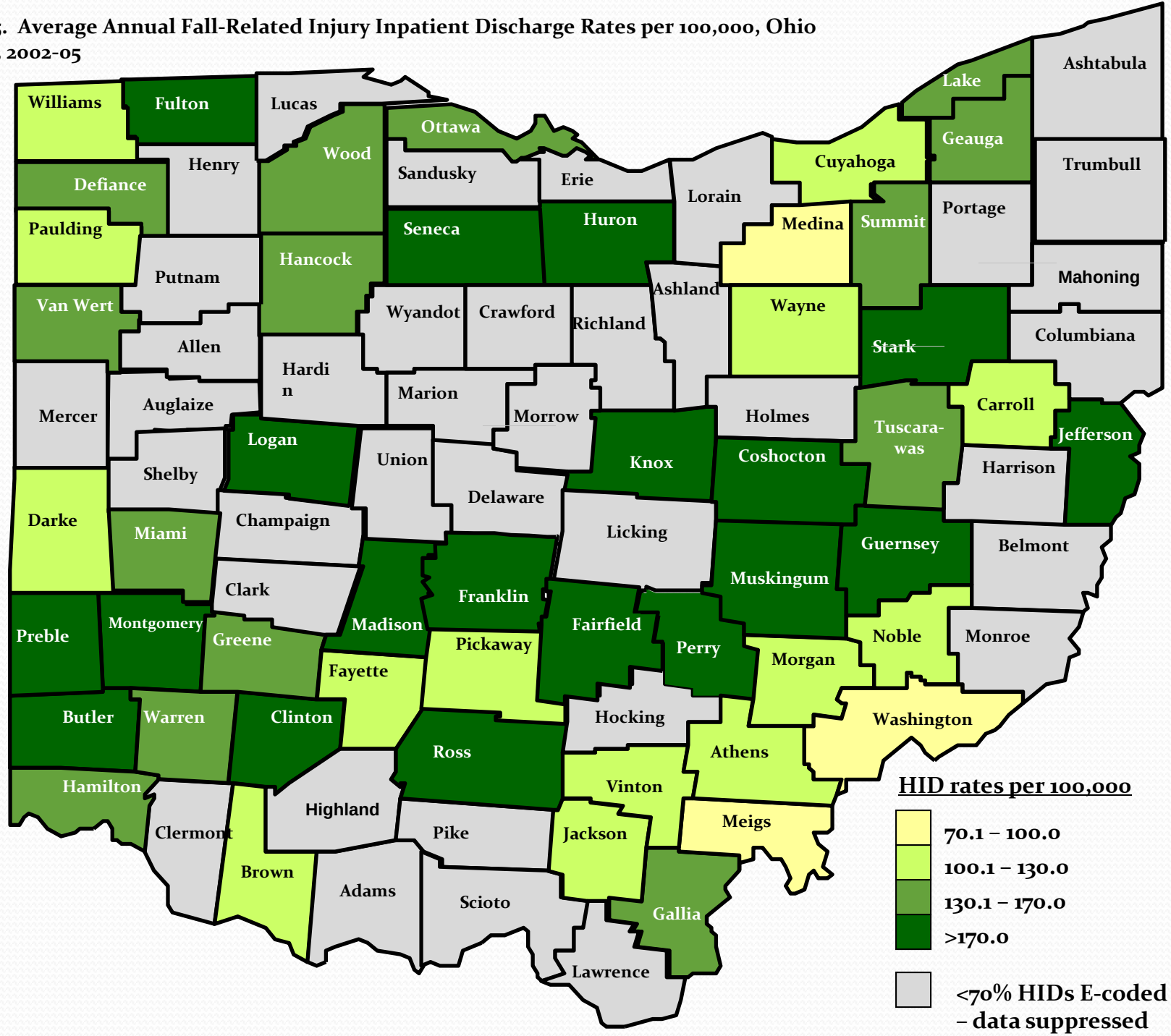
Fatal fall[1] rate[2] by sex, marital status, ages 65 and older, Ohio, 2002-05



[1]Source: ODH Office of Vital Statistics

[2]per 100,000

Figure 105. Average Annual Fall-Related Injury Inpatient Discharge Rates per 100,000, Ohio residents, 2002-05



Multi-factorial approach includes all of the following components:

- **Medical Management** - Risk assessment by a health professional.
- **Balance and Mobility** - Increasing and improving physical activity (PA) or increasing access to PA opportunities.
- **Environmental Modification** - Home safety (Projects should address other home safety hazards for older adults as well; e.g., fire/burns, poisoning/medications, etc.).

Assessment, Media, Policy, Environment/Systems Change and Training/Education objectives should focus on addressing these components.

Summary of Key Points

- Older adults accounted for more than 90 percent of all fall-related hip fractures.
- Fall-related emergency room-visit and inpatient hospitalization rates are higher for falls than all other injuries combined among older adults.
- Older adults accounted for $4.2 billion, more than two-thirds (68 percent), of the total annual costs of nonfatal, hospital-admitted falls.
- In 2005, older adults accounted for 81 percent of fall-related deaths and represented only 13 percent of the population.
- The 515 deaths among this group in 2002 increased to 973 in 2007, representing a 93% increase.

Summary of Key Points

- Falls among older adults have reached epidemic proportions and rates continue to rise.
- Older adults account for a disproportionate share of fall-related injury.
- The likelihood of falling and the severity of fall-related injury increases with age, and therefore the risk for hospitalization and death.
- Age and gender play a large role in determining risk for type of fall.
- Older adults with poor health status and those who are isolated are at greater risk for falling.
- Falls are not a normal part of aging.