# Understanding and Utilizing Fatal and Non-Fatal Injury Data for Infants and Children Ages 0-4

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# Expectant Parent COP States

| | | |
|---|---|---|
| Arizona | Maine | Rhode Island |
| Iowa | Maryland | South Carolina |
| Illinois | Massachusetts | Texas |
| Indiana | Michigan | Vermont |
| Kentucky | Missouri | Virginia |
| Louisiana | Nevada | West Virginia |

# CSN, Economics Data Analysis Resource Center (EDARC)

**Children's Safety Network,** Economics Data Analysis Resource Center (CSN-EDARC) assists regional, state and local agencies with data gathering and analysis services

In partnership with other members of CSN, we provide technical assistance, support, and resources on injury data sources, data analyses, injury costs, and cost modeling. We study risk factors to identify problems, focus program responses, and evaluate prevention programs.

# Childhood Injury Data Overview

- General trends describing childhood:
  - Deaths
  - Injuries
  - Emergency Department Visits
- Consumer Products Associated with Childhood Injuries
- Effective interventions targeting largest injury populations

# Data Sources

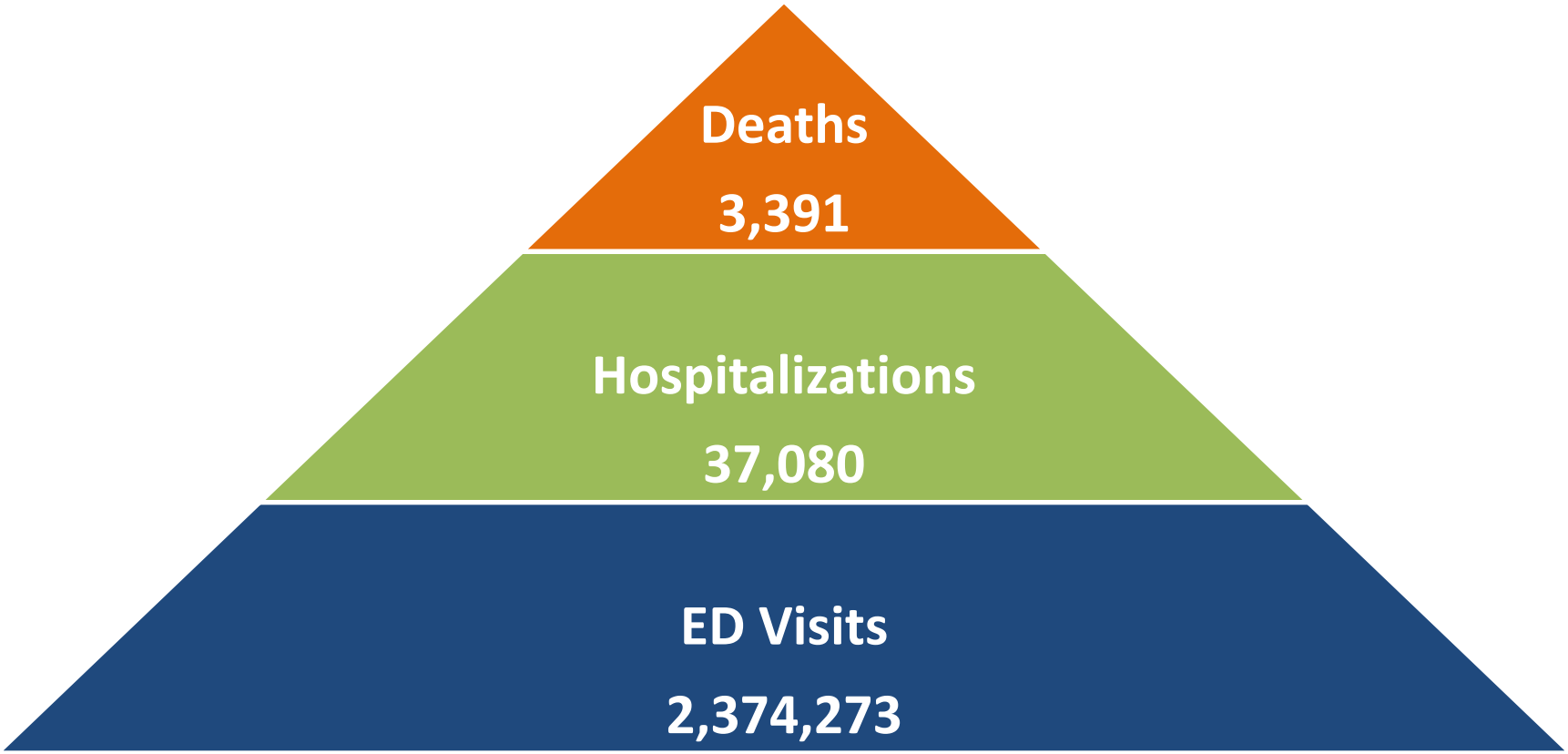
- Mortality Data:
  - Contains mortality and population counts for all U.S. counties
  - Data are based on death certificates for U.S. residents each containing a single underlying cause of death, up to twenty additional multiple causes
  - Demographic data for the deceased
- Hospital Admitted Data:
  - Healthcare Cost and Utilization Project, Nationwide Inpatient Sample (HCUP NIS)
  - Contains data on more than seven million hospital stays from approximately 1,000 hospitals
  - Large sample size is ideal for developing national and regional estimates
  - Fatalities Removed from this analysis

# Data Sources

- Product Related Injuries:
  - National Electronic Injury Surveillance System-All Injury Program (NEISS-AIP)
  - Weighted national probability sample collected at 66 U.S. hospitals.
  - Collected for every emergency department (ED) visit among participating hospitals
  - Product associated injuries under the jurisdiction of the Consumer Product Safety Commission (CPSC).
  - Includes ~500,000 ED injury visits per year

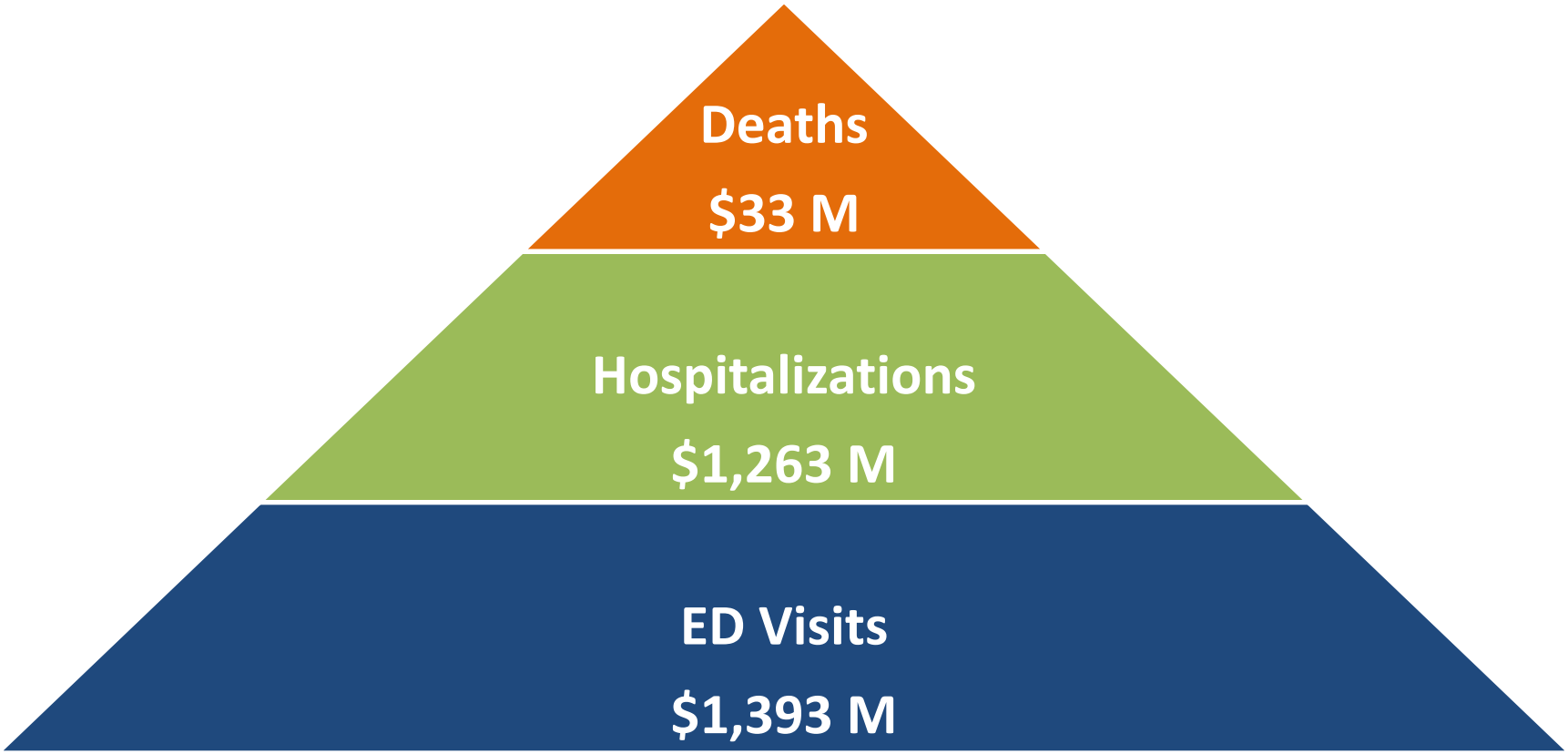
# Poll Questions

# Injury Related ED Visits, Hospitalizations, Deaths, Children Ages 0-4, 2005



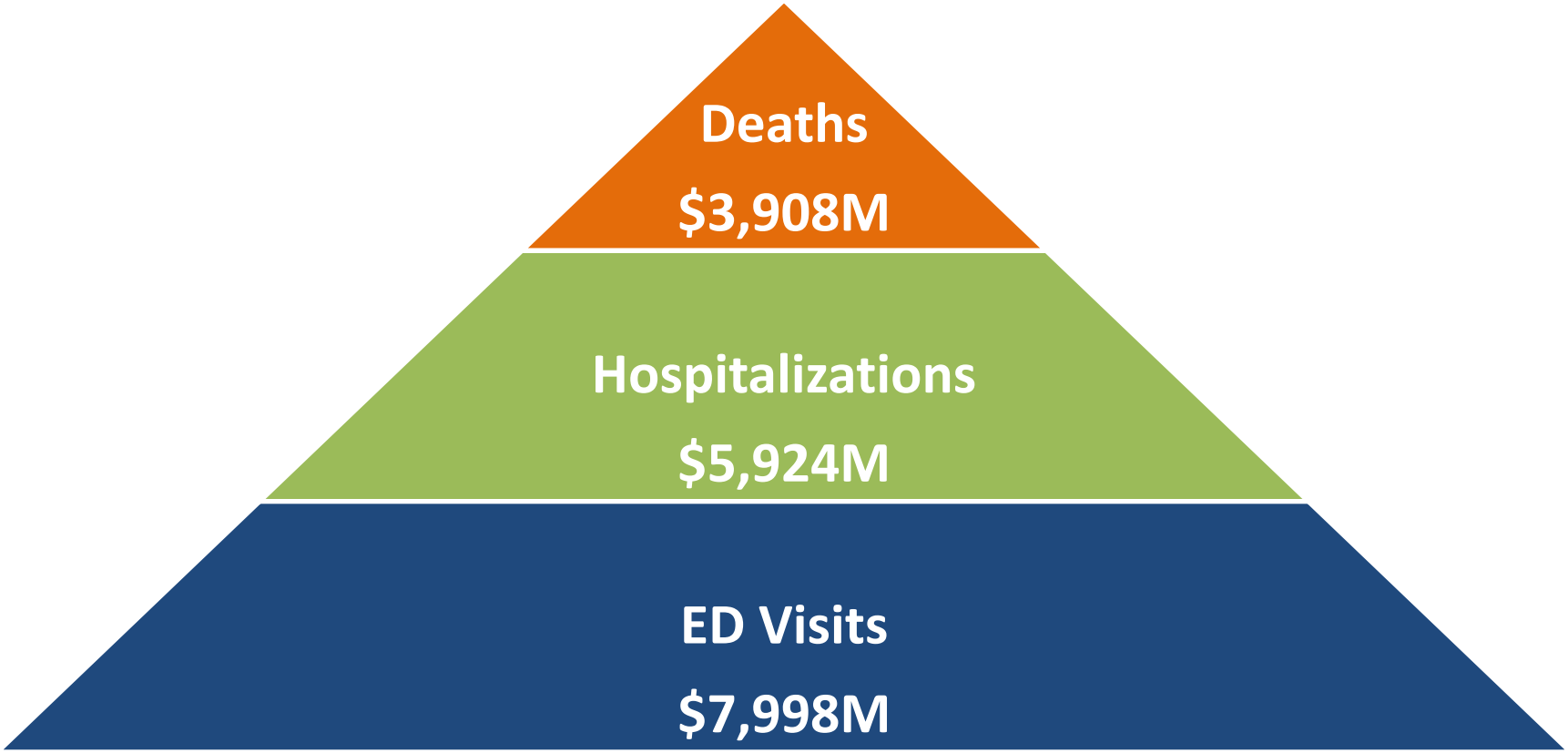

Source: CDC WISQARS, Cost of Injury Reports, 2005 Incidence and Dollars

# Medical Costs: ED Visits, Hospitalizations, Deaths, Children Age 0-4, 2005



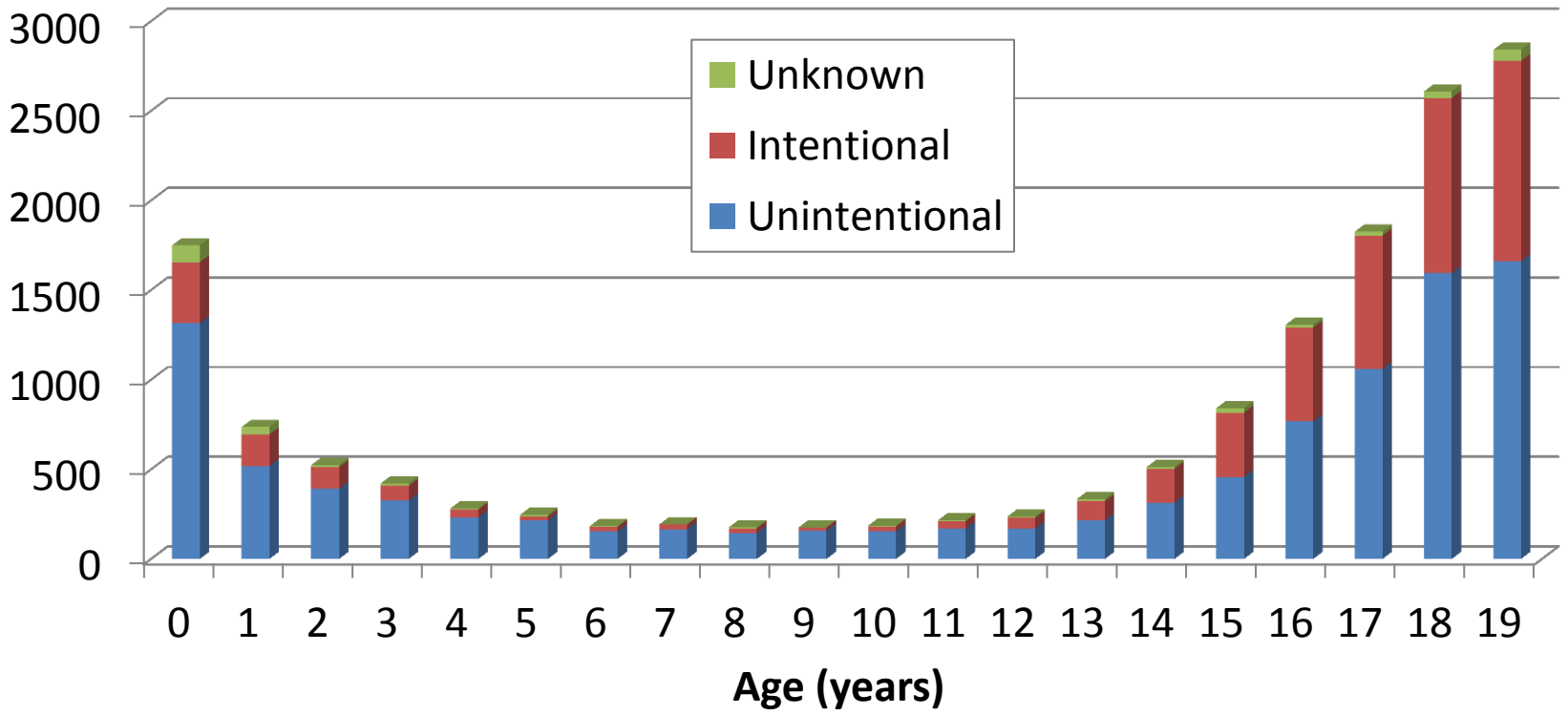

Source: CDC WISQARS, Cost of Injury Reports, 2005 Incidence and Dollars

# Comprehensive Costs: ED Visits, Deaths, Hospitalizations, Children Age 0-4, 2005



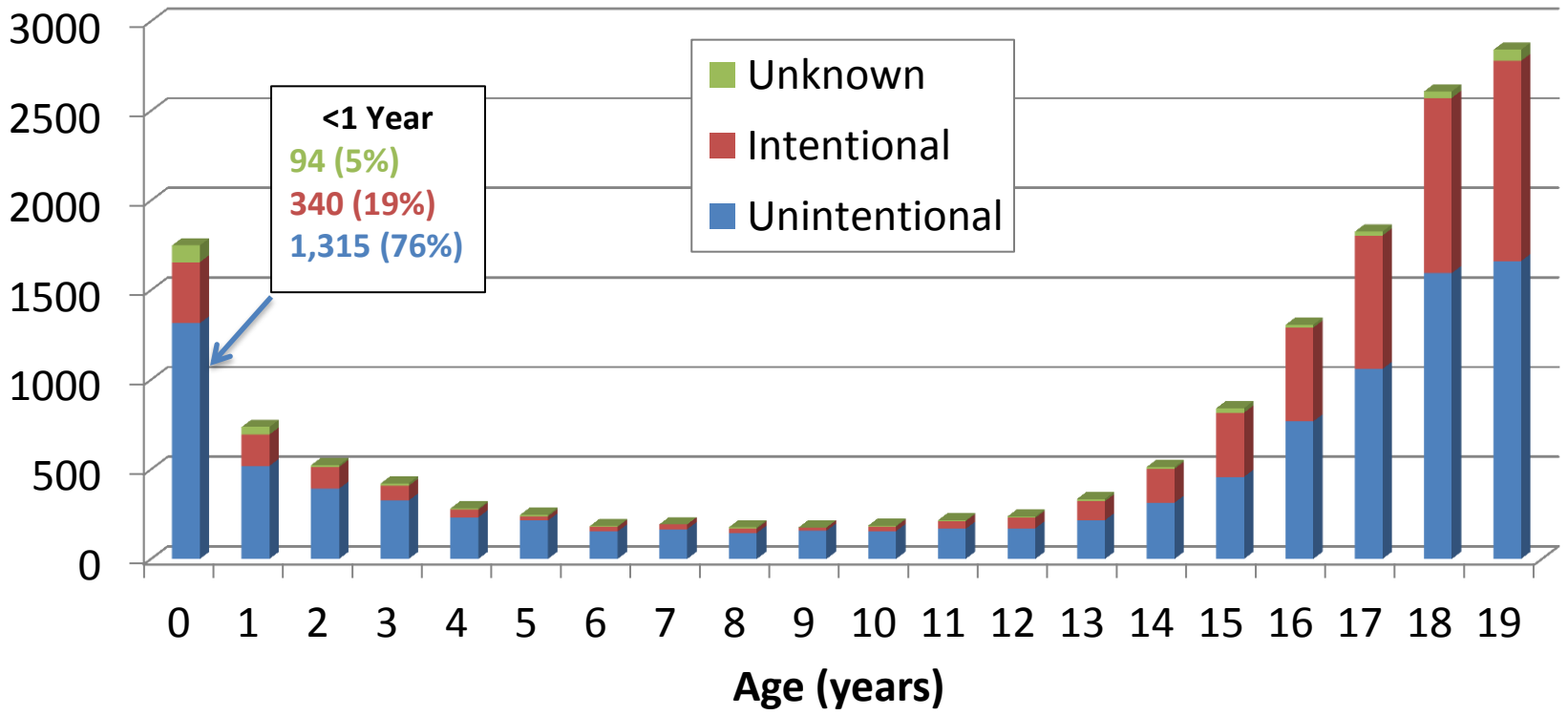

Source: CDC WISQARS, Cost of Injury Reports, 2005 Incidence and Dollars

# Distribution of Injury Deaths by Age, 2008




Source: National Center for Health Statistics, Multiple Cause of Death Data, 2008.

# Distribution of Injury Deaths by Age, 2008




Source: National Center for Health Statistics, Multiple Cause of Death Data, 2008.

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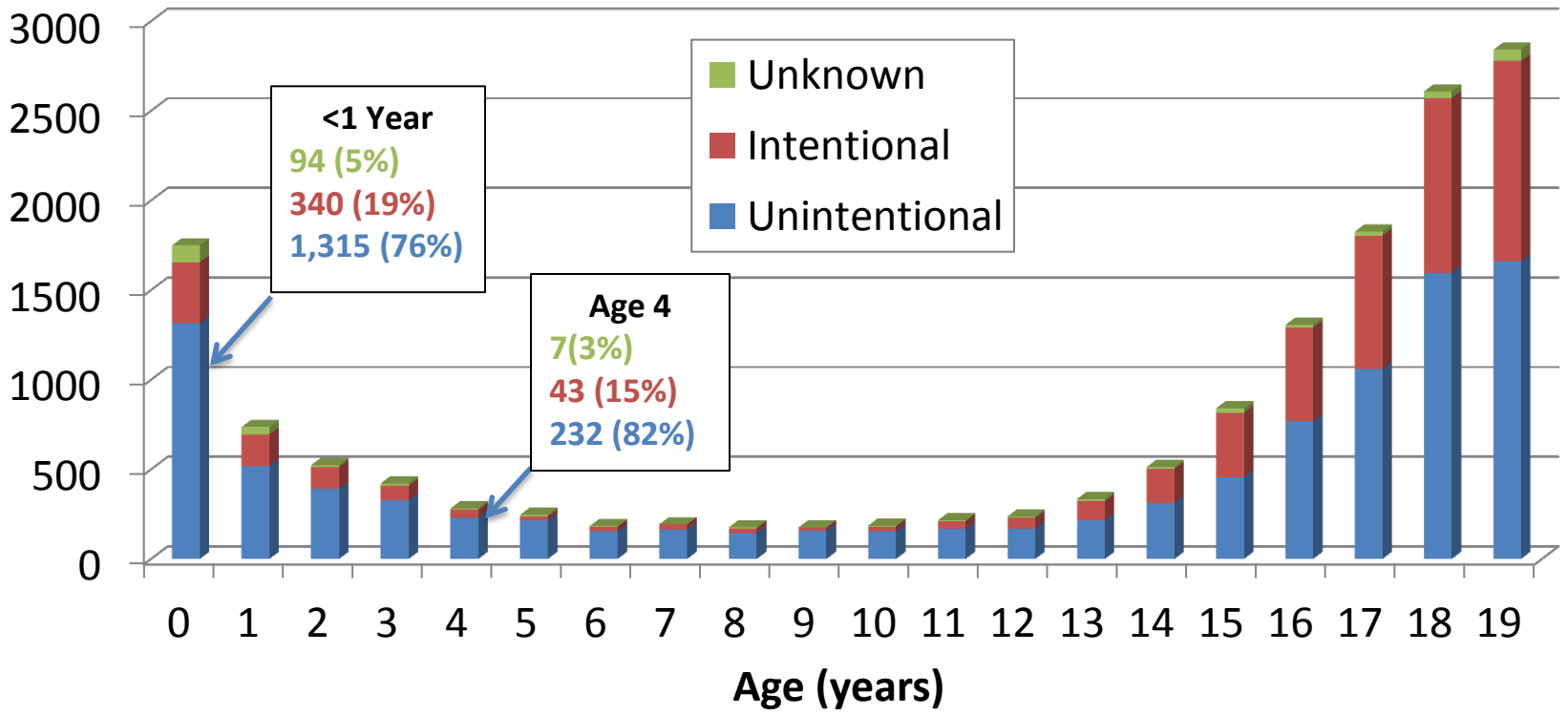


Source: National Center for Health Statistics, Multiple Cause of Death Data, 2008.

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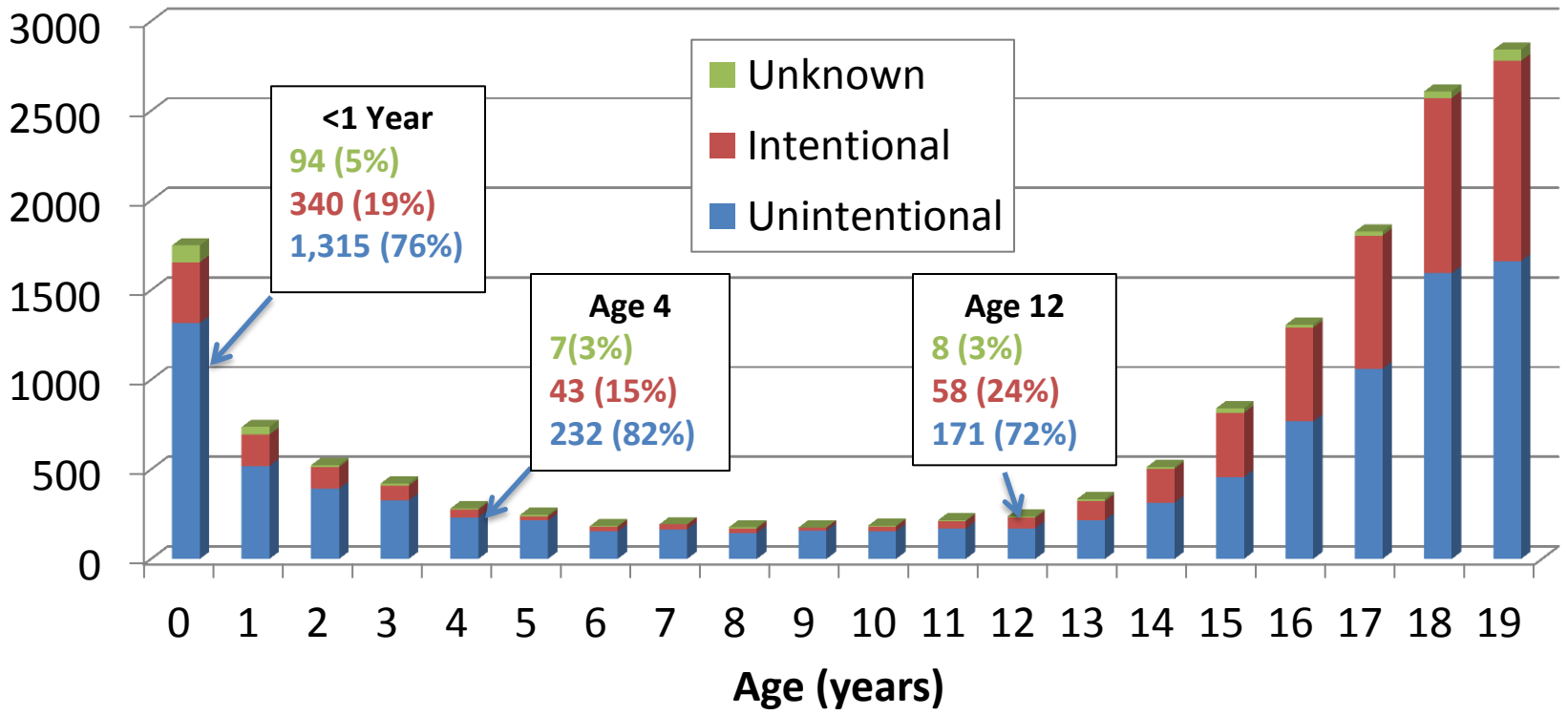
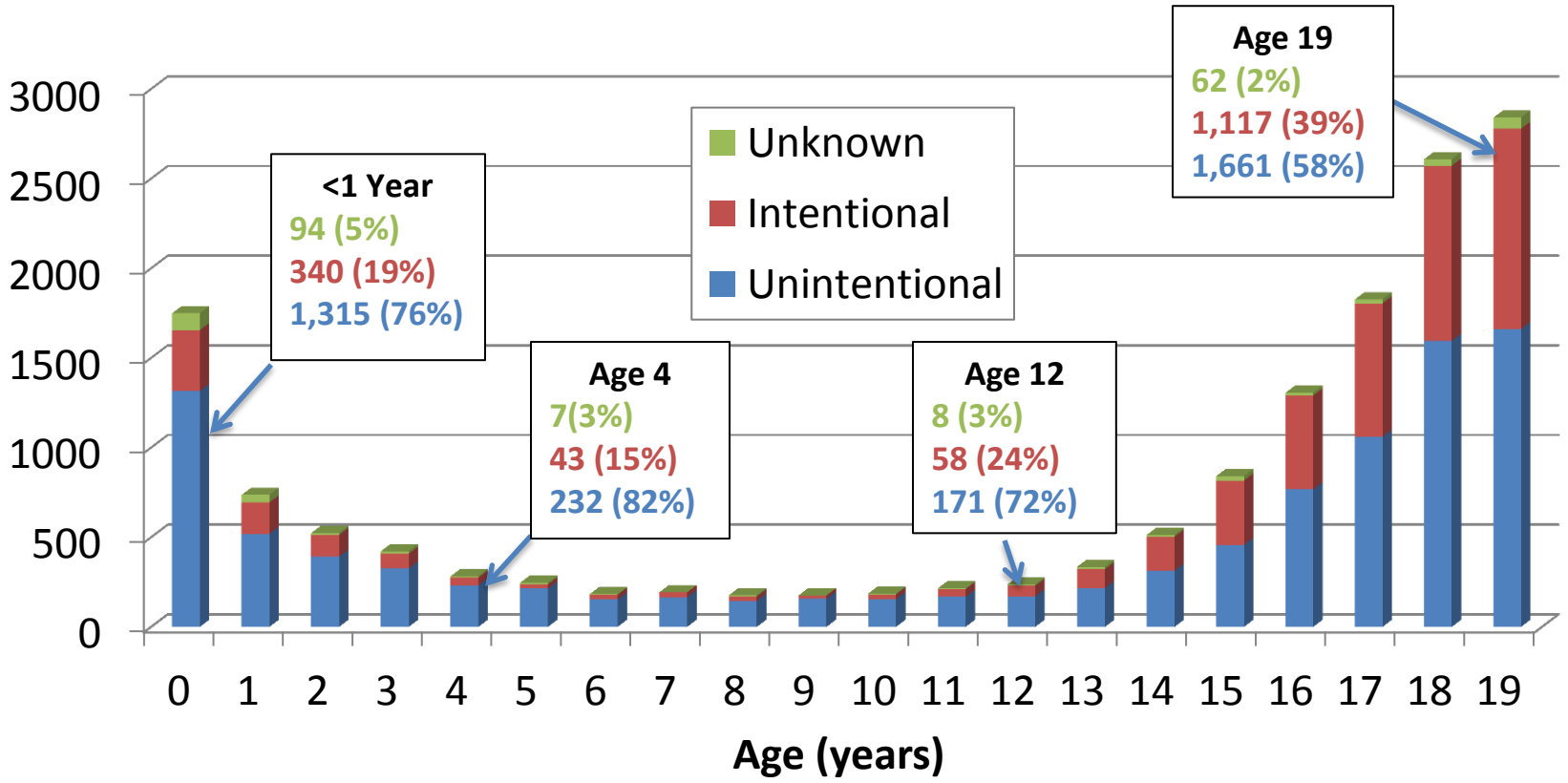



Source: National Center for Health Statistics, Multiple Cause of Death Data, 2008.

# Distribution of Injury Deaths by Age, 2008



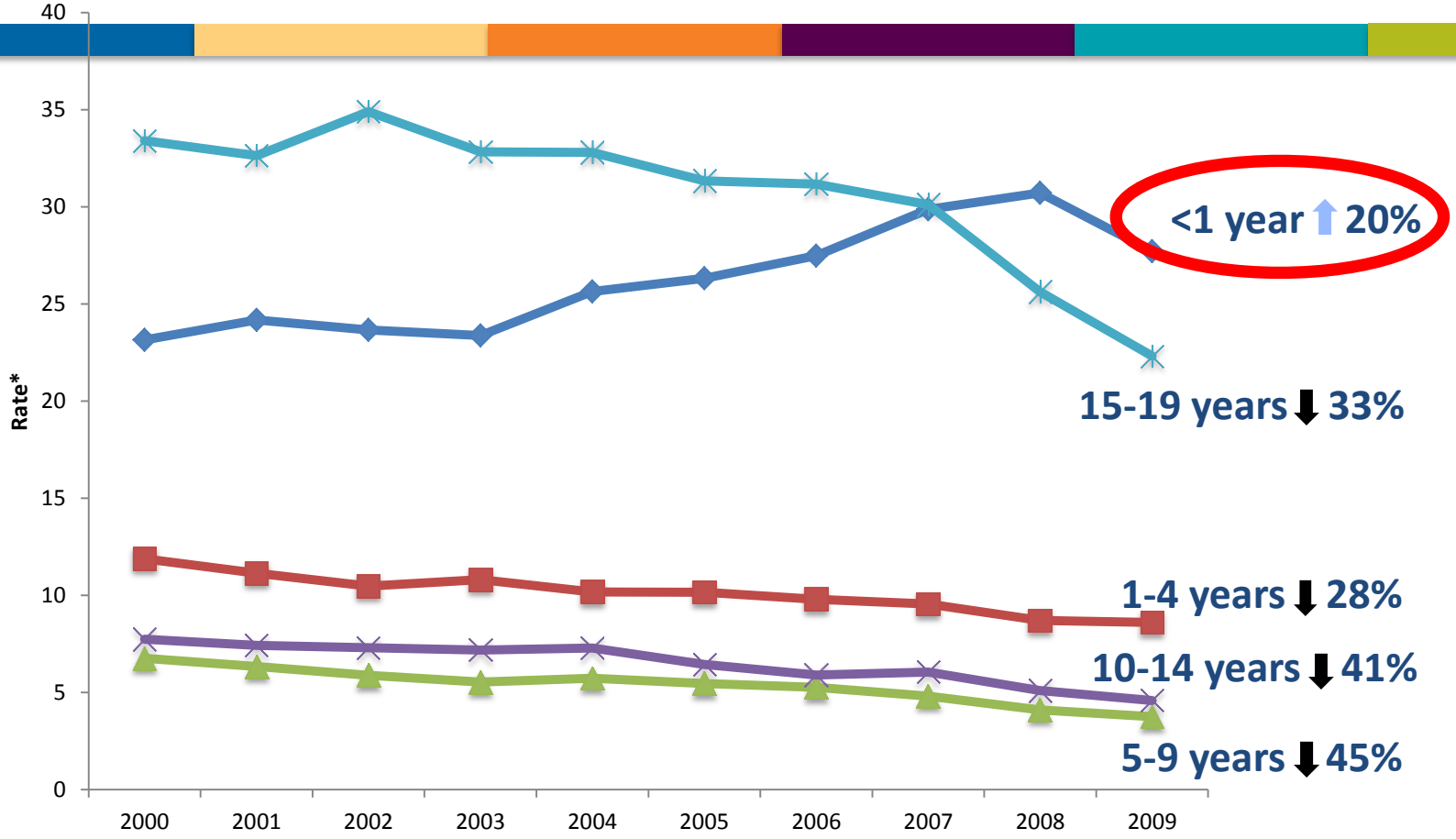

Source: National Center for Health Statistics, Multiple Cause of Death Data, 2008.

# 10 Leading Causes of Injury Deaths by Age Group Highlighting Unintentional Injury Deaths, United States – 2008

| | Age Groups | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank | <1 | 1-4 | 5-9 | 10-14 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ | Total |
| 1 | Unintentional Suffocation 1,058 | Unintentional Drowning 443 | Unintentional MV Traffic 385 | Unintentional MV Traffic 532 | Unintentional MV Traffic 8,647 | Unintentional MV Traffic 6,358 | Unintentional Poisoning 7,545 | Unintentional Poisoning 9,496 | Unintentional MV Traffic 4,137 | Unintentional Fall 19,742 | Unintentional MV Traffic 37,985 |
| 2 | Homicide Unspecified 156 | Unintentional MV Traffic 346 | Unintentional Drowning 138 | Homicide Firearm 143 | Homicide Firearm 4,394 | Unintentional Poisoning 5,946 | Unintentional MV Traffic 5,446 | Unintentional MV Traffic 5,866 | Unintentional Poisoning 3,547 | Unintentional MV Traffic 6,167 | Unintentional Poisoning 31,116 |
| 3 | Homicide Other Spec., Classifiable 98 | Homicide Unspecified 132 | Unintentional Fire/Burn 111 | Suicide Suffocation 141 | Unintentional Poisoning 3,188 | Homicide Firearm 3,612 | Suicide Firearm 2,796 | Suicide Firearm 3,789 | Suicide Firearm 3,079 | Unintentional Unspecified 4,769 | Unintentional Fall 24,013 |
| 4 | Unintentional MV Traffic 98 | Unintentional Fire/Burn 169 | Homicide Firearm 44 | Unintentional Drowning 123 | Suicide Firearm 2,009 | Suicide Firearm 2,357 | Homicide Firearm 1,966 | Suicide Poisoning 2,004 | Unintentional Fall 1,809 | Suicide Firearm 4,143 | Suicide Firearm 18,223 |
| 5 | Undetermined Suffocation 46 | Unintentional Suffocation 145 | Unintentional Suffocation 41 | Unintentional Fire/Burn 64 | Suicide Suffocation 1,653 | Suicide Suffocation 1,752 | Suicide Suffocation 1,855 | Suicide Suffocation 1,772 | Suicide Poisoning 1,164 | Unintentional Suffocation 3,200 | Homicide Firearm 12,179 |
| 6 | Unintentional Drowning 41 | Unintentional Pedestrian, Other 111 | Unintentional Other Land Transport 28 | Unintentional Other Land Transport 64 | Unintentional Drowning 569 | Suicide Poisoning 764 | Suicide Poisoning 1,486 | Unintentional Fall 1,300 | Suicide Suffocation 818 | Adverse Effects 1,677 | Suicide Suffocation 8,578 |
| 7 | Homicide Suffocation 32 | Homicide Other Spec., Classifiable 77 | Unintentional Pedestrian, Other 24 | Suicide Firearm 50 | Homicide Cut/Pierce 504 | Undetermined Poisoning 606 | Undetermined Poisoning 836 | Homicide Firearm 1,146 | Unintentional Suffocation 562 | Unintentional Poisoning 1,296 | Suicide Poisoning 6,442 |
| 8 | Undetermined Unspecified 28 | Homicide Firearm 56 | Unintentional Fall 22 | Unintentional Suffocation 50 | Suicide Poisoning 334 | Homicide Cut/Pierce 476 | Unintentional Fall 540 | Undetermined Poisoning 1,066 | Homicide Firearm 489 | Unintentional Fire/Burn 1,118 | Unintentional Suffocation 6,125 |
| 9 | Adverse Effects 24 | Unintentional Struck by or Against 44 | Homicide Unspecified 15 | Unintentional Poisoning 37 | Unintentional Other Land Transport 302 | Unintentional Drowning 429 | Unintentional Drowning 406 | Unintentional Drowning 510 | Unintentional Fire/Burn 476 | Suicide Poisoning 675 | Unintentional Unspecified 5,911 |
| 10 | Unintentional Fire/Burn 22 | Unintentional Fall 38 | Unintentional Struck by or Against 13 | Unintentional Firearm 29 | Undetermined Poisoning 299 | Unintentional Fall 297 | Homicide Cut/Pierce 393 | Unintentional Suffocation 490 | Undetermined Poisoning 455 | Suicide Suffocation 580 | Unintentional Drowning 3,548 |

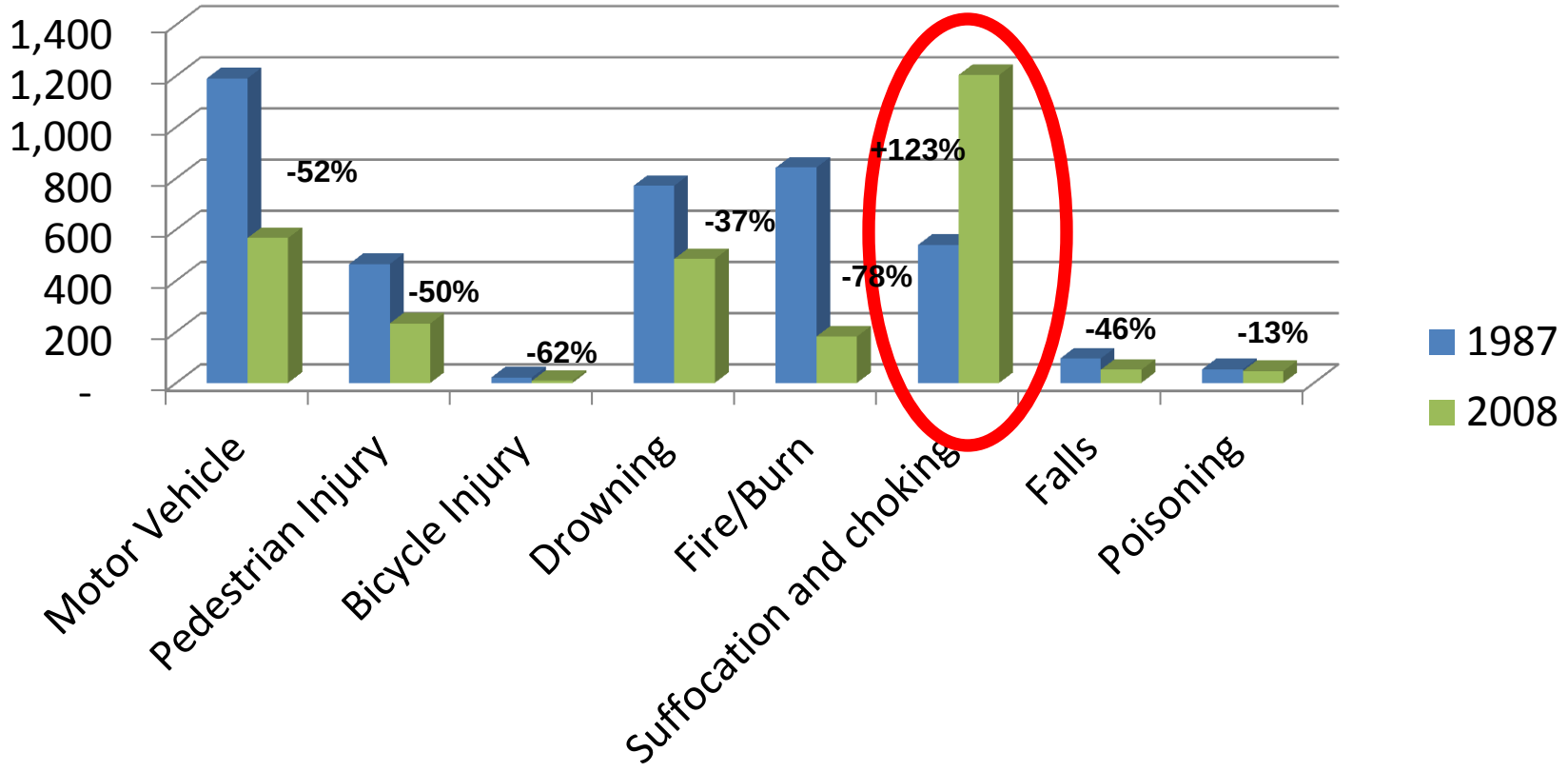
Source:

# Unintentional Injury Deaths- Rates per 100,000 by Age Group



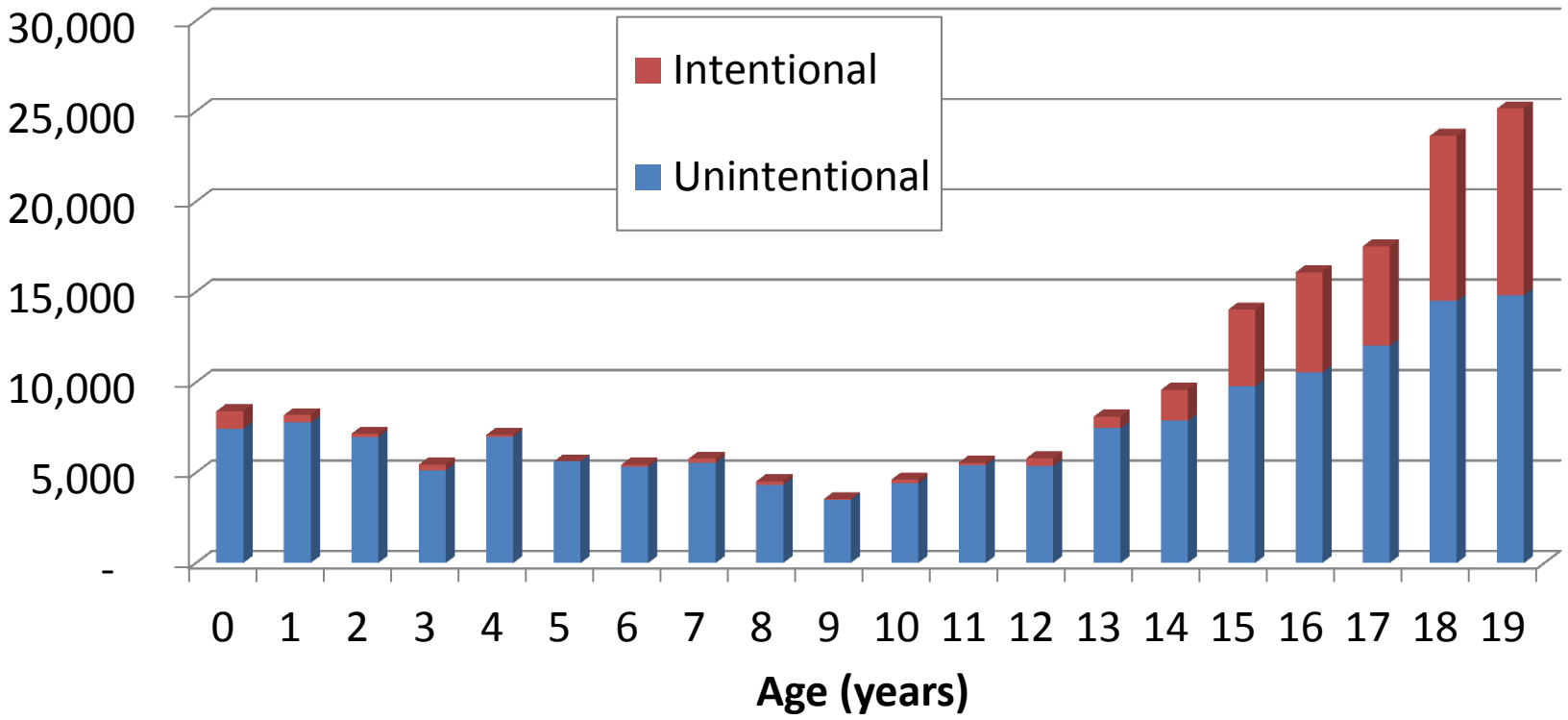

National Center for Health Statistics, Multiple Cause of Death Data, 2000-2009.

# Unintentional Injury Deaths by Mechanism- Children 0-4 YRS




Source: National Center for Health Statistics, Multiple Cause of Death Data, 1987, 2008

# Distribution of Hospital Admitted Injuries by Age



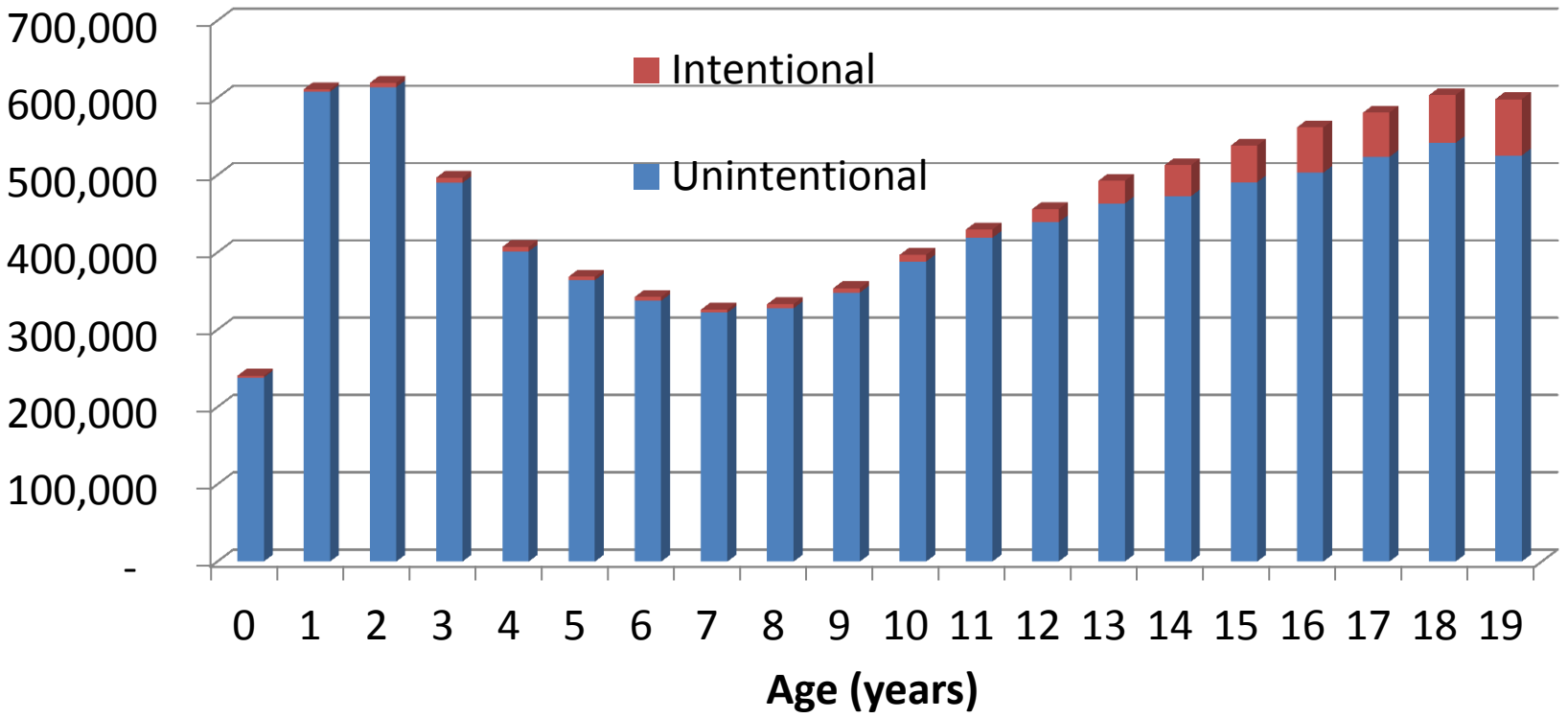

Source: 2008 Healthcare Utilization Project, Nationwide Inpatient Sample

# Leading Causes of Hospital Admitted Unintentional Injuries, NIS 2008

| Rank | LT 1 | 1-4 years | 5-9 years |
|---|---|---|---|
| 1 | Fall 3,595 | Fall 9,743 | Fall 11,093 |
| 2 | Suffocation 815 | Poisoning 5,378 | Bites and stings 2,188 |
| 3 | Poisoning 785 | Hot object/ substance 3,097 | MVT Occupant 2,033 |
| 4 | Hot object/ substance 771 | Bites and stings 2,708 | Struck by/against 1,966 |
| 5 | Other natural/env 543 | Struck by/against 1,553 | Pedal cyclist, other 1,463 |
| 6 | Struck by/against 407 | MVT Occupant 1,417 | Transport, other 1,296 |
| 7 | Bites and stings 393 | Drowning/ submersion 782 | MVT Pedestrian 1,127 |
| 8 | MVT Occupant 234 | Suffocation 737 | Poisoning 986 |
| 9 | Cut/pierce 178 | MVT Pedestrian 718 | Cut/pierce 809 |
| 10 | Drowning/ submersion 107 | Cut/pierce 511 | Hot object/ substance 700 |

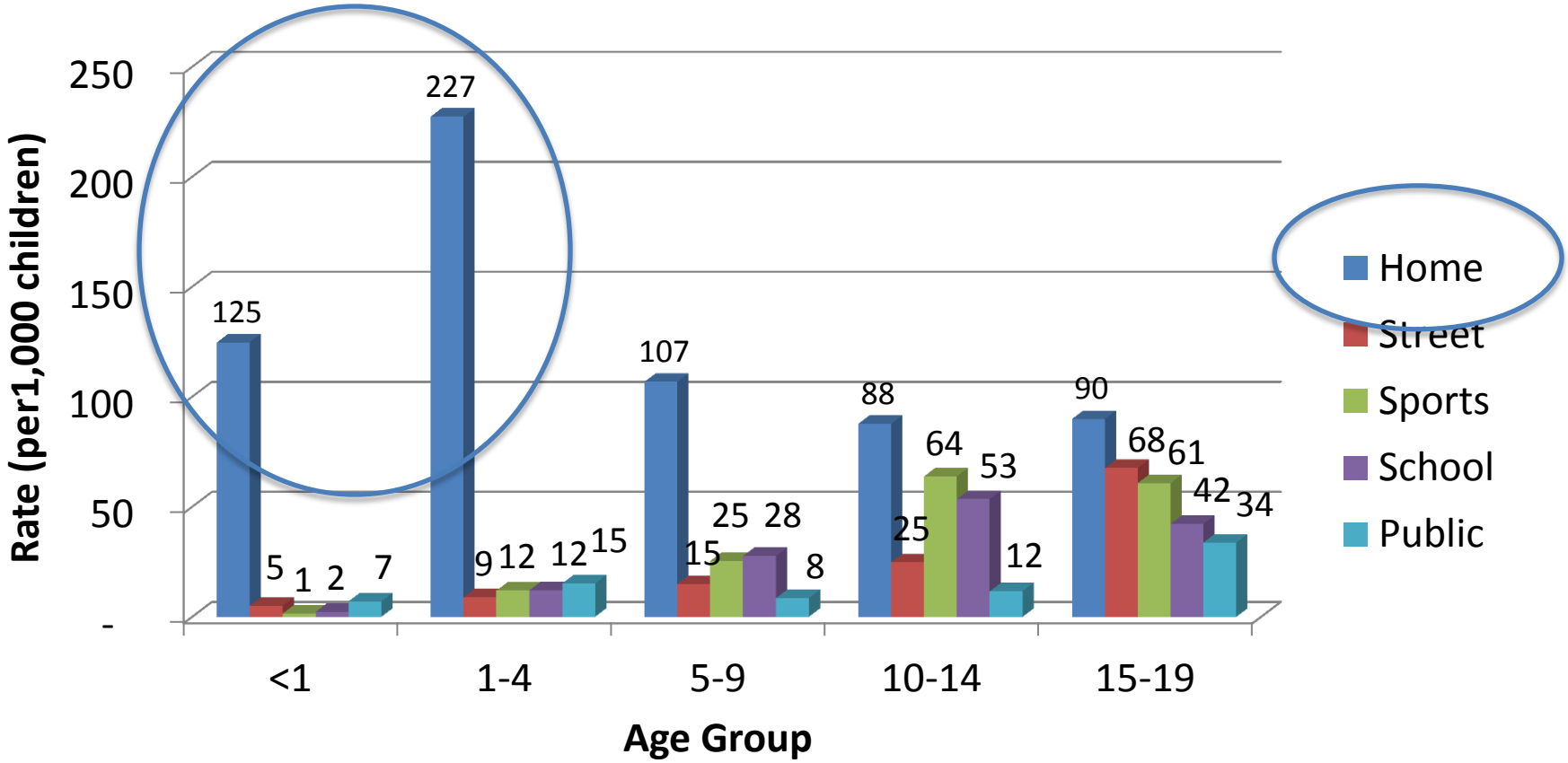
Source: 2008 Healthcare Utilization Project, Nationwide Inpatient Sample

# Distribution of Injury Related ED Visits by Age- 2008




Source: NEISS, 2008

# Injury Rate Per 1,000 Children by Location of Injury (ED Visits), 2008




Source: 2008, National Electronic Injury Surveillance System -- All Injury Program

# Leading Products Associated with Falls by Age Group- ED Visits in 2008

| Rank | Age <1 | Age 1-4 | Age 5-9 |
|---|---|---|---|
| 1 | BEDS OR BEDFRAMES<br>31,740 | BEDS OR BEDFRAMES<br>86,957 | MONKEY BARS<br>46,504 |
| 2 | FLOORS<br>17,246 | STAIRS OR STEPS<br>76,955 | BEDS OR BEDFRAMES<br>33,839 |
| 3 | STAIRS OR STEPS<br>9,934 | FLOORS<br>64,642 | STAIRS OR STEPS<br>30,200 |
| 4 | SOFA OR COUCH<br>8,722 | TABLES (EXCL. BABY CHANGING TABLES)<br>60,832 | FLOORS<br>29,017 |
| 5 | TABLES (EXCL. BABY CHANGING TABLES)<br>5,968 | CHAIRS<br>49,121 | SWINGS OR SWING SETS<br>28,909 |
| 6 | CAR SEATS<br>5,869 | SOFA OR COUCH<br>36,747 | SCOOTERS<br>17,338 |
| 7 | BABY STROLLERS<br>4,131 | BATHTUB OR SHOWER<br>19,402 | CHAIRS<br>17,146 |
| 8 | CHAIRS<br>3,779 | TOYS, Other<br>14,622 | TABLES<br>16,939 |
| 9 | HIGH CHAIRS<br>2,450 | GROCERY OR SHOPPING CARTS<br>14,552 | TRAMPOLINES<br>16,834 |
| 10 | CRIBS<br>2,077 | CEILINGS AND WALLS<br>14,261 | SLIDES<br>13,102 |

Source: 2008, National Electronic Injury Surveillance System -- All Injury Program

# Kids Are Clumsy & They Like to Have Fun

Sample NEISS Case Narratives-

- 2 year old, male- Present to ER after he fell out of bed hitting his head on dresser- Dx: blunt head trauma
- 2 year old, female- Running in home and struck head against interior wall of home, no loc, no vomiting, laceration of scalp present 1.5 cm. Dx: scalp lac
- 2 year old, male Patient's mother states patient sneezed and piece of crayon fell out of nose . Patient evaluated for further foreign body in nose. Dx: foreign body

Source: National Electronic Injury Surveillance System – Sample Cases

# Primary Categories of Hospital Admitted Injury – Age <5

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
- Drowning (889, $27M)

- Effective interventions exist which can reduce the overall incidence and cost of injury among children
- Medical costs due to injury provide an effective measure to help target injury prevention resources

# Primary Categories of Hospital Admitted Injury – Age <5: FALLS

- Falls (13,338, $217M)
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Strategies to protect children from fall-related injuries include:

- Install safety gates on stairs and guards on windows
- Don't leave a baby alone on a changing table, bed, couch or other furniture
- Active Supervision by an adult
- Use properly fitting bike helmets when riding tricycles
- Regulate/mandate how playgrounds are constructed providing a soft landing surfaces

# Primary Categories of Hospital Admitted Injury – Age <5: FALLS

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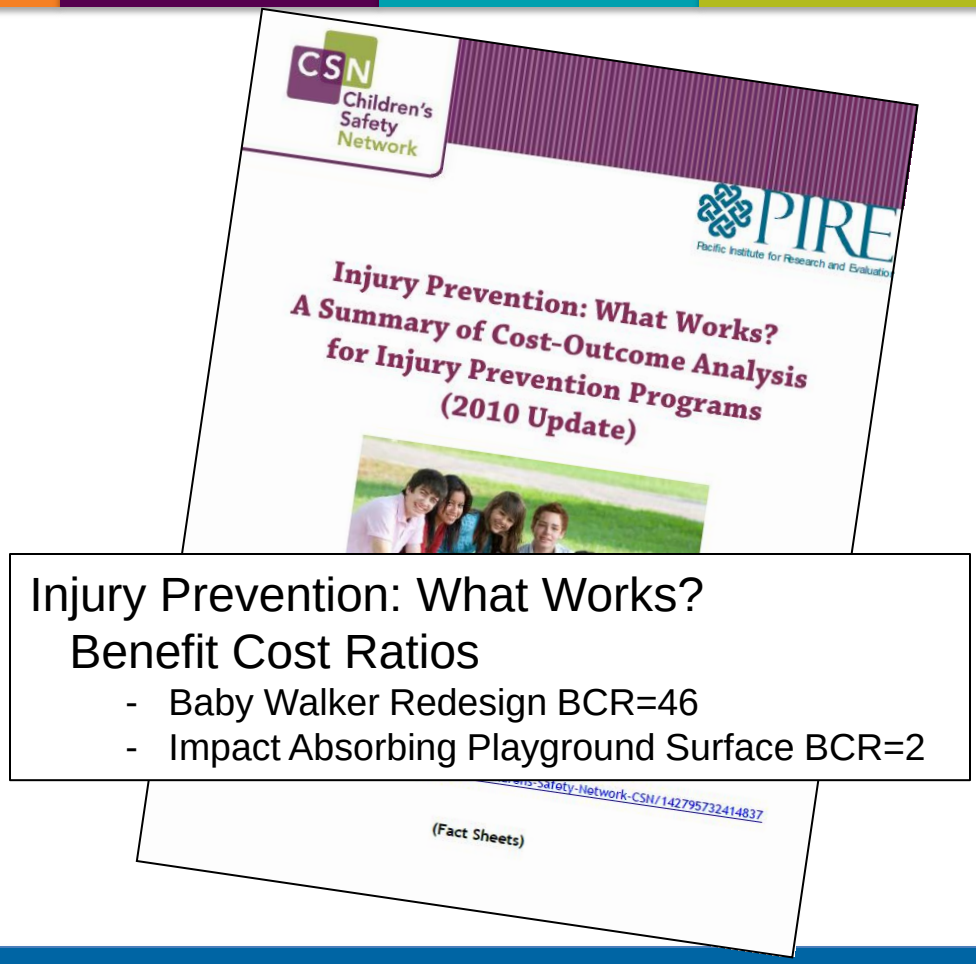


Injury Prevention: What Works?
Benefit Cost Ratios
- Baby Walker Redesign BCR=46
- Impact Absorbing Playground Surface BCR=2

# Primary Categories of Hospital Admitted Injury – Age <5: POISONINGS

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
- Drowning (889, $27M)

- For kids, ED visits for medication poisonings are twice as common as poisonings from other household products (cleaning solutions, personal care products)
- ED visits for medication poisonings are most common in children <6 years of age
- One out of every 180 two-year-olds visits an emergency department for a medication poisoning



Source: Schillie SF, Shehab, N, Thomas, KE, Budnitz DS. Medication overdoses leading to emergency department visits among children. Am J Prev Med 2009;37:181-187.

# Primary Categories of Hospital Admitted Injury – Age <5: HOT OBJECTS

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
- Drowning (889, $27M)

- Keep coffee, hot liquids and hot foods out of the child's reach
- Use extra care when cooking on the stove
- Watch a child in the bathtub at all times
- Unplug electrical appliances, and keep them away from water and beyond the child's reach
- Keep the hot water heater turned to a safe temperature
- Keep space heaters safe

# Primary Categories of Hospital Admitted Injury – Age <5: MOTOR VEHICLES

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
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- Child safety seats reduce deaths by 71% for infants (younger than 1 year old) and by 54% for toddlers (1-4 years old)
- Among children under age 5, an estimated 309 lives were saved by child safety seat use in 2009

# Primary Categories of Hospital Admitted Injury – Age <5: MOTOR VEHICLES

- Falls (13,338, $217M)
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- A 2003 study identified critical CRS misuse for 72.6 percent of passenger vehicle installations. (Decina, 2003)

  Most common critical misuses
  - Loose harness straps
  - Improperly securing the child to the CRS
  - Loose vehicle safety belt attachment around the CRS

- Car seat check events educate parents
  - child passenger safety technicians teach families how to transport children correctly

# Primary Categories of Hospital Admitted Injury – Age <5: SUFFOCATION

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
- Drowning (889, $27M)

- CDC suggests that the decline in SIDS since 1999 corresponds to increased SUID rates (e.g., overlaying, suffocation, wedging deaths) during the same period.
- Interventions include adoption of safe sleep practices by parents

# Primary Categories of Hospital Admitted Injury – Age <5: SUFFOCATION

- Falls (13,338, $217M)
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# Primary Categories of Hospital Admitted Injury – Age <5: DROWNING

- Falls (13,338, $217M)
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- Suffocation (1,552, $64M)
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- Provide close and constant supervision of infants and toddlers in and around water
- Around Water- Avoid distractions and remain close enough to touch infants and toddlers
- Do not use flotation devices as a substitute for adult supervision

# Primary Categories of Hospital Admitted Injury – Age <5: DROWNING

- Falls (13,338, $217M)
- Poisonings (6,163, $45M)
- Hot Objects (3,868, $69M)
- Motor Vehicle (1,651, $65M)
- Suffocation (1,552, $64M)
- Drowning (889, $27M)

- Install four-sided fencing around residential pools
- Ensure that the gates of residential pool fences are self-latching and self-closing; the latches must also be beyond a child's reach
- Be aware that inflatable, portable pools also pose a drowning hazard

# Poll Question

# Leading Consumer Products by Percent of Nonfatal Injury Cost, Age <1, US

| Rank | 1995-96 | % | 2009-10 | % |
|---|---|---|---|---|
| 1 | Stairs or steps | 15 | Beds (not cribs) | 22 |
| 2 | Beds (not cribs) | 11 | Floors | 14 |
| 3 | Floors | 9 | Sofas | 7 |
| 4 | Baby walkers | 6 | Stairs or steps | 6 |
| 5 | Tables | 5 | Car Seats | 5 |
| 6 | Baby strollers | 4 | Tables | 3 |
| 7 | Sofas | 4 | Chairs | 3 |
| 8 | Car seats | 3 | Strollers, Cribs, Shopping Carts (tie) | 2 |

# Leading Consumer Products by Percent of Nonfatal Injury Cost, US, 2009-10

| Rank | Age 1-4 | % | Age 5-9 | % |
|---|---|---|---|---|
| 1 | Beds | 9 | Bicycles | 8 |
| 2 | Floors | 7 | Monkey bars | 7 |
| 3 | Stairs | 7 | Beds | 5 |
| 4 | Tables | 5 | Floors | 4 |
| 5 | Chairs | 5 | Football | 3 |
| 6 | Sofas | 4 | Trampolines | 3 |
| 7 | Poisoning | 4 | Stairs | 3 |
| 8 | Doors | 4 | Doors | 3 |

# Observations

- Parent awareness of threats in and around the home, coupled with mindful supervision of young children could lead to significant reduction in injury incidence and cost

- Non-fatal injury distributions differ from fatal injury distributions- it is important to understand both when interventions and policy decisions are being made

- Effective strategies have led to significant reductions in injury populations over the past 20 years

Children's Safety Network
National Injury and Violence Prevention Resource Center

# Contact Information

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