Injury and Violence

Preventable Injuries

The category of “injuries” includes both those that are intentional (due to violence) and those that are unintentional. As a whole, injuries rank among the top 15 causes of death for Americans of all ages.\textsuperscript{1} Most events that result in injury are predictable and preventable.

In Pennsylvania, injury is the leading cause of death for residents between the ages of 1 and 44 years old. Still, deaths are only a small portion of the full impact of injury. For every death injury causes, eleven non-fatal injuries result in hospitalization.

![Figure 6.1 Deaths by Injury, Non-Communicable Disease, Infectious Disease for Residents Aged 1 to 44, Pennsylvania, 2010\textsuperscript{2}](image)

The leading causes of unintentional injury-related deaths and hospitalizations in Pennsylvania from 2000 to 2010 were falls, motor vehicle crashes and poisoning. Among falls, motor vehicle crashes, poisonings, and firearms, 15 percent of hospitalizations and 33 percent of deaths were related to traumatic brain injury.

Fortunately, unintentional injuries and violence are preventable, but effective prevention requires comprehensive and coordinated approach that addresses the complex underlying factors. A “public health approach” relies on data collection and analysis, identification of populations and geographic areas at greatest risk, identification of both risk and protective factors, and the development and utilization of evidence-based programs at the individual, family, community and society levels.

The U.S. Department of Health and Human Services has set the national Healthy People 2020 goal as 53.3 deaths from injury per 100,000 population. The 2007 U.S. baseline for this figure is 59.2 deaths from injury per 100,000 population, age-adjusted to the year 2000 standard population.\textsuperscript{3}

The age-adjusted 2010 rate for Pennsylvania is just below the U.S. baseline, but well above the Healthy People 2020 goal, at 58.6 injury-related deaths per 100,000 population.\textsuperscript{4}
Data sources
Population-based surveillance is the preferred method for monitoring injury occurrence, since risk factors and rates can be calculated and generalized to the broader population. Cities and counties typically have data at the local level that can be used to develop community-based projects to address local injury prevention priorities. Population-based surveillance systems that can provide specific information about counties and metropolitan areas are useful for assessing the need for local prevention projects, as well as their effectiveness.

In its 2007 “Consensus Recommendations for Injury Surveillance in State Health Departments,” the Safe States Alliance identifies 11 core data sets for identifying injury priorities and assessing health impact. The Alliance also emphasizes a distinction between accessing a data set, assessing the quality of the data it contains, and analyzing the data.

Table 6.1 Injury Surveillance Data Sets, 2013

<table>
<thead>
<tr>
<th>Data Set</th>
<th>Accessed?</th>
<th>Assessed?</th>
<th>Analyzed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital records</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Hospital discharge</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fatality Analysis Reporting System (FARS)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Behavioral Risk Factor Surveillance System (BRFSS)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Youth Risk Behavior Surveillance System (YRBSS)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency department</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Coroner/medical examiner</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Child death review</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>National Occupant Protection Use Survey (NOPUS)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Uniform Crime Reporting System (UCR)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Emergency medical services (EMS)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Since many injuries receive medical care in the emergency department only, they are not included in hospital discharge databases, making statewide emergency department datasets more important for injury surveillance. Thirty-two states reported having such a dataset available in 2010. The state lacks a centralized statewide electronic database for emergency department visits.

Based on the National Hospital Ambulatory Medical Care Survey and the Pennsylvania Hospital Report, the estimate of injury-related emergency department visits in the state for 2010 was about 30 percent, for about 1.8 million visits.

Endnotes


Unintentional Injuries

Unintentional injury is the leading cause of death among Pennsylvania residents between the ages of 1 and 44 years old. In 2010, unintentional injuries accounted for 5,607 deaths and 123,901 hospitalizations, which is roughly about 15 deaths and 300 hospitalizations each day. Over the twenty year period from 1990 to 2010, the percent of deaths caused by unintentional injury rose by 30 percent.

Figure 6.2 Deaths by Unintentional Injury and Cause, Pennsylvania, 1990 to 2010

The Healthy People 2020 goal for deaths due to unintentional injuries is 36.0 deaths per 100,000 population, compared to a baseline of 40.0 deaths per 100,000 population based on 2007 data, age-adjusted to the 2000 standard population. According to 2010 data, Pennsylvania’s rate of deaths due to unintentional injuries is slightly higher than the U.S. baseline, at 40.1 deaths per 100,000 population.

Falls

Falls account for over half of all unintentional injuries, and are the leading cause of both injury-related hospitalizations and traumatic brain injury. The rate of fall-related deaths has increased steadily as Pennsylvania’s population has aged. The 2010 age-adjusted rate of 8.3 deaths per 100,000 population is 2.6 times higher than the 1990 rate of 3.2 deaths per 100,000 population.

Figure 6.3 Deaths Due to Falls by Rate and Age, Pennsylvania, 1990 to 2010

Hospitalizations and deaths caused by falls occur much more often among adults age 55 and older than to younger adults in Pennsylvania. Women account for more than half of all hospitalizations and deaths due to falls in this age group than do men. Whites are nearly twice as likely as blacks to die from a fall.
In terms of health costs, falls in Pennsylvania accounted for about $3.3 billion in hospitalization costs in 2010, an increase of nearly 40 percent since 2006. About 74 percent of charges related to falls were billed to Medicare.

Motor Vehicle Injuries

“Motor vehicle injuries” include injuries related to interaction with motor vehicles, whether they are due to motor vehicle occupants, motorcyclists, bicyclists, pedestrians, or other. In Pennsylvania, motor vehicles resulted in more injury-related deaths than any other cause for many years; in 2008, it was surpassed by drug poisoning. Since 1990, the age-adjusted rate for death related to motor vehicles has decreased 26 percent, from 14.1 deaths per 100,000 population to 10.5 deaths per 100,000 population in 2010. Injury related to motor vehicles is the second highest cause of hospitalizations in the state.

In Pennsylvania, male drivers between the ages of 16 and 25 years old are involved in more motor vehicle accidents than any other group. Together, male and female drivers aged 16 to 25 years accounted for 29 percent of all motor vehicle accidents statewide in 2010.
Seat belts were worn by 77 percent of motor vehicle occupants involved in accidents in Pennsylvania during 2010. Of motor vehicle fatalities that year, 58 percent were not wearing seatbelts. The estimated economic loss due to reportable traffic crashes in 2010 totaled $14.5 billion, as estimated $4 billion (28 percent) of which is attributed to drivers between the ages of 16 and 25 years.

**Poisonings**

Unintentional drug poisoning overtook motor vehicle accidents as the number one cause of injury death in Pennsylvania in 2008. In 2010, drug poisoning resulted in 1,550 deaths and 5,744 hospitalizations statewide, roughly 4 deaths and 16 hospitalizations each day. The age-adjusted rate of death from drug poisoning doubled between 2001 and 2010; the 2010 rate of death from this cause is nearly five times greater than they were in 1990.

The rate of unintentional poisoning due to drug use among blacks in Pennsylvania has generally decreased, while the rate for whites has increased. In 1990, black residents were more than three times as likely to die of a drug-related poisoning as white residents; in 2010, there was no significant different between the rates of unintentional drug poisoning deaths for blacks and whites.

Males accounted for 67 percent of all deaths due to unintentional drug poisoning in Pennsylvania in 2010. More males between the ages of 25 and 59 years died from this cause than as a result of motor vehicle related injuries.
**Fire and Burns**
In Pennsylvania, injuries related to fire and burns were the fifth leading cause of death as a result of unintentional injury in 2010. That year, fire and burns resulted in 143 deaths and 585 hospitalizations. The age-adjusted rate of deaths caused by fire and burns decreased from 1.9 per 100,000 population to 1.0 per 100,000 population between 1990 and 2010.

The very young (younger than 5) and elderly (80 and older) had the highest rates of injury due to these causes. The rate of death due to fire-related injuries was twice as high for blacks as for whites.

**Drowning**
Drowning is consistently a leading cause of injury-related hospitalization and death among children ages 0 to 4 years old in Pennsylvania. In 2010, children in this age group accounted for 34 percent of hospitalizations and 11 percent of deaths caused by drowning.

For Pennsylvania residents of all ages, drowning was the seventh leading cause of unintentional injury, accounting for less than one percent of deaths and hospitalizations due to injury. In 2010, 79 deaths and 71 hospitalizations occurred as a result of drowning. Males accounted for 76 percent of deaths and 72 percent of hospitalizations related to drowning. That year, the rate of drowning deaths reached its lowest point since 1990.
Across the Lifespan
The top five causes of unintended injury leading to death vary by stage of life; causes in childhood (ages 0 to 19) are somewhat different from those of adulthood (ages 20 to 54) or older adulthood (55 and over).

Table 6.2 Leading Causes of Death Due to Unintentional Injury by Age Group, Pennsylvania, 2006 to 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>0 to 19</th>
<th>20 to 54</th>
<th>55 and older</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Motor vehicle (51%)</td>
<td>Drug poisoning (52%)</td>
<td>Falls (44%)</td>
</tr>
<tr>
<td>2</td>
<td>Drug poisoning (12%)</td>
<td>Motor vehicle (31%)</td>
<td>Motor vehicle (17%)</td>
</tr>
<tr>
<td>3</td>
<td>Suffocation (9%)</td>
<td>Falls (4%)</td>
<td>Suffocation (10%)</td>
</tr>
<tr>
<td>4</td>
<td>Fire/burns (9%)</td>
<td>Fire/burns (2%)</td>
<td>Drug poisoning (8%)</td>
</tr>
<tr>
<td>5</td>
<td>Drowning (7%)</td>
<td>Other transport (2%)</td>
<td>Fire/burns (3%)</td>
</tr>
</tbody>
</table>

Children, Ages 0 to 19: In 2010, unintentional injuries resulted in 7,854 hospitalizations and 354 deaths among youth younger than 20 years old in Pennsylvania. The top five leading causes of death are shown in Table 6.2. Between 2004 and 2010, the rate of death from unintentional injury decreased 13.4 percent, while the rate of hospitalization for this cause decreased 26.6 percent.

Adults, Ages 20 to 54: In 2010, unintentional injuries resulted in 34,266 hospitalizations and 2,547 deaths among adults aged 20 to 54 years old in Pennsylvania. The top five leading causes of death are shown in Table 6.2. Although deaths due to injuries sustained in motor vehicle accidents have decreased over time, the rate of death due to drug poisoning has increased.

Adults, Ages 55 and older: In 2010, unintentional injuries resulted in 83,696 hospitalizations and 2,705 deaths among adults 55 and older in Pennsylvania. The leading causes of death are shown in Table 6.2.
Intervention Strategies
A seminal piece of prevention research, “The Spectrum of Prevention,” identifies a need for care providers to view prevention as more than just teaching healthy behaviors and identifies six interrelated action levels:

- Strengthening individual knowledge and skills
- Promoting community education
- Educating providers
- Fostering coalitions and networks
- Changing organizational practices
- Influencing policy and legislation

The six levels of strategy development serve as a framework for more comprehensive understanding of prevention. These levels are complementary and, when used together, produce a synergy that results in greater effectiveness than any single activity. Communities and organizations should employ this framework when planning prevention efforts. The following resources are available to aid in development of prevention efforts across the Spectrum.

Resources
Prevention Strategies

- **Guide to Community Preventive Services (The Community Guide):** Presents systematic reviews of the effectiveness of interventions to reduce or prevent motor vehicle crash injuries in the following areas: use of child safety seats, use of safety belts and reducing alcohol-impaired driving. Available at http://www.thecommunityguide.org/mvoi

- **Evidence-Based Effective Strategies for Preventing Injuries: Child Restraints, Seat Belts, Reducing Alcohol-Impaired Driving, Teen Drivers, Child Abuse Prevention, Bike Helmets, Resident Fire and Drowning:** Available at http://www.ihs.gov/injuryprevention/documents/david%20wallace%20effective%20strategies.pdf

- **Effective Interventions to Reduce or Prevent Injuries to Teen Drivers, Bicyclists, Residential Fires and Drowning:** Available at http://www.cdc.gov/injury/


- **Preventing Falls: What Works. A CDC Compendium of Effective Community Based Interventions from Around the World:** This guide describes 14 scientifically tested interventions to reduce the risk of falls and subsequent injuries among adults age 65 and older, and provides guidance for implementation of these interventions. Programs are grouped into three categories: exercise-based, home modification and multifaceted. Available at http://www.cdc.gov/HomeandRecreationalSafety/Falls/pubs.html

- **Title III-D Highest Tier Evidence-Based Health Promotion/Disease Prevention Programs:** Details the evidence-based disease prevention and health promotion programs that have undergone the Older Americans Act Title III-D submission process, many focused on fall prevention. Available at http://www.ncoa.org/improve-health-center-for-healthy-aging/content-library/Title-III-D-Highest-Tier-Evidence-FINAL.pdf

- **Community-Based Injury Prevention Interventions:** This systematic review describes the effectiveness of interventions to reduce or prevent childhood injuries, found to be effective at increasing some safety practices such as use of bicycle helmets and car seats among children. The evidence is less compelling that interventions improve other behaviors, such as those related to child pedestrian safety or adolescent vehicle safety through reduced alcohol-impaired driving. Available at http://www.princeton.edu/futureofchildren/publications/journals/article/index.xml?journalid=46&articleid=213
• National Highway Traffic Safety Administration: Evaluations of the effectiveness and lives saved by safety equipment, such as seat belts, air bags, electronic stability control or side impact protection. Available at http://www.nhtsa.gov/

Return on Investment

Endnotes


Violence

Violence is a serious public health problem. From infancy to old age, it affects people at all stages of life. The number of deaths due to violence is only part of the story; many survive violence but are left with permanent physical and emotional scars. Violence also erodes communities by reducing productivity, decreasing property values and disrupting social services. ¹

Exposure to violence at any point affects overall health and future risk of violence. The Adverse Childhood Experiences (ACE) study is a collaboration between the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente’s Health Appraisal Clinic (San Diego, CA) involving the analysis of more than 17,000 members of a health maintenance organization (HMO) undergoing comprehensive physical examination who provided detailed information about their childhood experience of abuse, neglect and family dysfunction. To date, more than 50 research articles have been published and 100 conference/workshop presentations have been made based on this study data. Findings suggest that certain adverse experiences are major risk factors for illness, death and poor quality of life in the U.S. and can help inform interventions to prevent homicide, suicide, sexual violence, domestic violence, and child abuse and neglect.²

Homicide

As shown in Figure 6.11, 677 homicides and 4,082 assault-related injuries resulted in hospitalization in Pennsylvania in 2010. Homicide rates have generally decreased statewide since 1990, from 6.7 deaths per 100,000 age-adjusted population in 1990 to 5.6 deaths per 100,000 population in 2010. Pennsylvania’s urban areas have homicide and assault rates that are more than triple those of its rural areas.

Leading causes of homicide and assaults have been firearms, stabbing and being struck by/against. Firearms were used in 72 percent of all homicides in 2010; it was the leading cause of death for blacks and the fourth-highest cause for whites. Black males between the ages of 15 and 49 years old accounted for over half of all homicides in Pennsylvania that year.

![Figure 6.11 Leading Causes of Homicides and Assaults, Pennsylvania, 2010](image)

Suicide

In 2010, more than twice as many suicides occurred in Pennsylvania as did homicides. Death certificate data show 1,547 deaths by suicide; 9,383 hospitalizations resulted from self-inflicted injuries. The age-adjusted death rate for suicide decreased from 11.8 per 100,000 population in 1990 to 10.1 deaths per population in 2001. However, rates have increased again, to 11.7 deaths by suicide per 100,000 population in 2010.
The rate of death by suicide for adults aged 45 to 69 increased nearly 40 percent between 1998 and 2010, while the rates for persons 10 to 44 years old and for persons 70 and older have remained stable.

![Figure 6.12 Deaths by Suicide, Three-Year Rates, Pennsylvania, 1998 to 2010](image)

In Pennsylvania, firearms were the leading means of suicide in 2010. Youth were more likely to hang or cut themselves, while adults were more likely to use firearms. Males were more likely to use firearms and females more likely to use poison. Rates of suicide are highest among persons 50 to 54 years old, and those over 75 years old. Males account for almost 80 percent of all suicides. Whites account for 93 percent. In Pennsylvania, firearms were the leading means of suicide in 2010. Youth were more likely to hang or cut themselves, while adults were more likely to use firearms. Males were more likely to use firearms and females more likely to use poison. Rates of suicide are highest among persons 50 to 54 years old, and those over 75 years old. Males account for almost 80 percent of all suicides. Whites account for 93 percent. Poisoning and cutting were the leading causes of hospitalizations due to self-inflicted injury. From 2006 to 2010, the rates of hospitalization due to self-injury were highest among Pennsylvania residents between the ages of 15 and 49 years old.

![Figure 6.13 Leading Causes of Suicides and Self-Inflicted Hospitalizations, Pennsylvania, 2010](image)

**Sexual Violence**

Sexual violence occurs any time a person is forced, coerced or manipulated into any unwanted sexual activity. It affects people of all ages and both sexes. Although a serious crime, it is often unreported due to social stigma. Still, it takes a toll on both mental and physical health.

In 2010, the lifetime prevalence rate for rape or forced penetration among women in Pennsylvania was 18.8 percent, just above the national rate of 18.3 percent. For the same year, the lifetime prevalence of sexual victimization other than rape among men was 18.6 percent for Pennsylvania’s male residents, compared with 22.2 percent nationally.
Adult victims

Figure 6.14 shows data from reports about sexual violence told by adults to staff at rape crisis centers in Pennsylvania during fiscal years 2008 and 2009 through 2011 and 2012. These data include assaults that went unreported to law enforcement, but still can be considered only a partial look at the problem of sexual violence in the state. The data were compiled by the Pennsylvania Coalition Against Rape.

Child victims

Figure 6.15 shows data from reports made about sexual assaults on children told to staff at rape crisis centers in Pennsylvania during fiscal years 2008 and 2009 through 2011 and 2012. Cases requiring a report to Childline, a reporting line for suspected child abuse in Pennsylvania, were reported per law. Rape crisis centers maintain statistics of these reports, regardless of investigative outcome from Children and Youth Services or law enforcement. The data are compiled by the Pennsylvania Coalition Against Rape.
Domestic Violence
In Pennsylvania, fatalities due to domestic violence, which include both victims and perpetrators, totaled 141 persons in 2012. Of those, 110 were victims, and 65.4 percent of those victims were female. Although data are sparse on this public health topic, nearly 38 percent of women residents reported experiencing violence, rape or stalking by a domestic or dating partner during their lifetime. In Philadelphia, in 2011, a survey of youth found that about 16.4 percent of girls and 13.5 percent of boys reported experiencing dating violence.

Figures 6.16 and 6.17 illustrate the number of homicides related to domestic violence that occurred in Pennsylvania over a ten-year period, with consideration to sex of the victim, and sex of the perpetrator. Both adult and child victims are included in these figures, as are those in heterosexual and same-sex relationships.

Figure 6.16 Deaths Due to Domestic Violence by Sex of Victim, Pennsylvania, 2003 to 2012

Figure 6.17 Deaths Due to Domestic Violence by Sex of Perpetrator, Pennsylvania, 2003 to 2012

Adverse Childhood Experiences
According to the 2010 Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS), 53 percent of Pennsylvania adults experienced at least once adverse childhood experience (ACE) in their youth: physical abuse, sexual abuse, emotional abuse, neglect, household mental illness, household alcohol or substance abuse, household domestic violence, parental separation or divorce, or incarcerated household member. About 30 percent of Pennsylvania’s adult residents reported more than one. Thirteen percent reported four or more factors.

Table 6.3 Adverse Childhood Experience Score by Sex, Pennsylvania, 2010

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>49±3</td>
<td>45±2</td>
<td>47±2</td>
</tr>
<tr>
<td>1</td>
<td>24±3</td>
<td>22±2</td>
<td>23±2</td>
</tr>
<tr>
<td>2</td>
<td>10±2</td>
<td>11±1</td>
<td>11±1</td>
</tr>
<tr>
<td>3</td>
<td>7±2</td>
<td>7±1</td>
<td>7±1</td>
</tr>
<tr>
<td>≥4</td>
<td>11±2</td>
<td>14±2</td>
<td>13±1</td>
</tr>
</tbody>
</table>
Neglect was not collected in the 2010 BRFSS survey. Of the eight types of ACE included in the survey, emotional abuse was most prevalent, affecting an estimated 31 percent of adults. The second leading ACE was presence of alcohol or substance abuse in the household, reported by 21 percent of adults. Of adults who have an ACE score of four or more, 60 percent are women. Women were much more likely than men to report experiencing sexual abuse as a child; 13 percent of women reported this, compared with 6 percent of men.

### Table 6.4 Adverse Childhood Experiences by Sex, Pennsylvania, 2010

<table>
<thead>
<tr>
<th>Type of Adverse Childhood Experience</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical abuse</td>
<td>13±2</td>
<td>14±2</td>
<td>13±1</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>6±2</td>
<td>13±2</td>
<td>10±1</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>31±3</td>
<td>31±2</td>
<td>31±2</td>
</tr>
<tr>
<td>Neglect</td>
<td></td>
<td></td>
<td>Not collected by 2010 BRFSS</td>
</tr>
<tr>
<td>Household mental illness</td>
<td>13±2</td>
<td>17±2</td>
<td>15±1</td>
</tr>
<tr>
<td>Household alcohol or substance abuse</td>
<td>18±2</td>
<td>23±2</td>
<td>21±2</td>
</tr>
<tr>
<td>Household domestic violence</td>
<td>14±2</td>
<td>14±2</td>
<td>14±1</td>
</tr>
<tr>
<td>Parental separation or divorce</td>
<td>18±2</td>
<td>21±2</td>
<td>20±2</td>
</tr>
<tr>
<td>Incarcerated household member</td>
<td>5±1</td>
<td>4±1</td>
<td>5±1</td>
</tr>
</tbody>
</table>

Higher ACE scores are associated with increased prevalence of risk behaviors. For example, the rate of chronic alcohol-impaired driving is higher among persons with an ACE score of four or more. They are also more likely to drive without wearing a seatbelt, to forego physical activity and to be obese. In addition, they are twice as likely to have ever been told by a doctor that they have asthma.

#### Child Abuse and Neglect

The number of substantiated reports of child abuse in Pennsylvania decreased between 2002 and 2011, according to the Pennsylvania Department of Public Welfare.

### Figure 6.18 Child Abuse Reports, Pennsylvania, 2002 to 2011

![Graph showing child abuse reports from 2002 to 2011, with bars for both total and substantiated reports.](image)
According to 2011 data, the most prevalent form of child abuse in Pennsylvania is sexual abuse, with female children comprising 80 percent of victims. Male children who suffered child abuse were more likely to die or nearly die than were female children.

The rate of child maltreatment in Pennsylvania tends to be just under the national average. For 2010, as shown in Table 6.5, the state rate was 9.0 per 1,000 children while the national figure was 9.2 per 1,000 children. These figures include both substantiated and unsubstantiated cases.

Table 6.5 Child Maltreatment Rates per 1,000 Children, Pennsylvania, 2008 to 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Pennsylvania</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9.2</td>
<td>9.4</td>
</tr>
<tr>
<td>2009</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>2010</td>
<td>9.0</td>
<td>9.2</td>
</tr>
</tbody>
</table>

Older Adult Abuse and Neglect

The number of reports of abuse, neglect and exploitation of older adults in Pennsylvania made to the Area Agencies on Aging increased by 16 percent over the course of just one year. The dramatic rise in cases from fiscal year 2009-2010 to fiscal year 2010-2011 may be a result of increased training, economic pressure, heightened public awareness and/or national attention to this growing problem.

The three most common types of complaints lodged in Pennsylvania during this time period were self-neglect, caregiver-neglect and financial exploitation.

Figure 6.19 Older Adult Abuse and Neglect Reports, Pennsylvania, 2008-2009, 2009-2010, and 2010-2011 (Fiscal Years)

Risk and Protective Factors

Our society must understand the underlying causes and risk factors for violence in order to prevent it in the future. The root causes they identify are: economics, oppression and mental health. These are extremely difficult to change, and addressing them will require substantial re-ordering of political and social priorities.

Six community risk factors also exacerbate violence, in terms of both frequency and severity: guns, media, alcohol and other drugs, incarceration, witnessing violence, and community deterioration. Although these are also difficult to change,
they are more amenable to modification than the three fundamental causes. This approach requires coordinated and complementary prevention efforts by public health, education, justice, public safety, social services, community organizations, businesses and faith-based institutions.

A combination of individual, relational, community and societal factors contribute to the risk of becoming a victim or perpetrator of interpersonal violence, including weak community sanctions against interpersonal violence; being a victim of physical or psychological abuse (consistently one of the strongest predictors of perpetration); and dominance and control of the relationship by one partner over the other.

Risk factors for child abuse and neglect include: parental substance abuse, poverty, social isolation and domestic violence between caregivers. Children with physical, cognitive or emotional disabilities are at a higher risk of child abuse than children without disabilities.\(^{27}\)

Protective factors include healthy relationship messages and education in communities and schools, from elementary grades through college; prenatal and early childhood healthy relationship programs; positive and diverse media images; community leadership involvement in prevention policies and initiatives; and healthy relationships among family members. Secondary and tertiary protective factors include keeping domestic violence services sustainable (e.g., counseling, advocacy, shelter, school and community programs) by increasing funding opportunities that allow programs to incorporate best practices from around the country and grow to meet community needs.

**Intervention Strategies**

Multiple levels of intervention are identified to promote health and prevent injury and disease.\(^{28}\) The framework is comprised of six interrelated action levels:

**Strengthening individual knowledge and skills:** Help individuals identify their risk factors for injury and violence, and provide them with information about how and where to get help, should they need it.

**Promoting community education:** Develop lessons about healthy relationships and sharing those lessons at all levels of schooling. Share positive messages throughout the community.

**Educating providers:** Health care providers have the capability to screen for violence and abuse; in response to a 2011 survey, 70 percent of Pennsylvanians said they would tell their doctor or nurse if they were experiencing domestic violence.\(^{29}\) Providers must be trained in methods to support patients and counsel them on risk factors.

**Fostering coalitions and networks:** Work at the community level to identify problems, develop resources, set policy, advocate and change norms.

**Changing organizational practices:** Support programs that provide necessary services, and develop strategies to improve positive, anti-violence messages in all facets of society. Engage women and girls, but also men and boys.

**Influencing policy and legislation:** Advocate for financial resources to support necessary programs, such as shelters, counseling, support groups, school programs, and legal and medical services.

Prevention and intervention strategies are most effective when they address each of the four layers of the Social Ecological Model: Individual, Relationship, Community and Society.\(^{30}\)

**Family Centers (FC):** FCs play a significant role in preventing children and families in Pennsylvania from entering into the formal child welfare system and help families achieve goals that have broad influence in their communities. FCs provide a variety of services which include child support, family support, health services, mental health services, adult self-sufficiency services, crisis intervention, and domestic violence and child abuse services. The FC vision is that “all Pennsylvania children and their families will be healthy, educated and self-sufficient and will be living in a safe home and community.” The centers strive to achieve the following outcomes: economic self-sufficiency for families through adult education, training and employment; health development and health care services for children; positive child development through effective parenting, early intervention and outreach activities; preservation of the family unit as
the foundation of success for children; and seamless, comprehensive, and easily accessed network of services for children and families.\textsuperscript{31}

**Evidence-based Practices:** There has been a growing movement to improve integration of evidenced-based practice in the field of child welfare in order to improve the physical and emotional well-being of children and families who come in contact with the system.\textsuperscript{32} Among some of the most promising practices currently being integrated in Pennsylvania are Family Group Decision Making, Parent-Child Interaction Therapy, Multisystemic Therapy and Cognitive Behavioral Therapy.

**Older Adults Protective Services Act:** In Pennsylvania, older adults are offered protection from abuse, neglect, exploitation and abandonment through The Older Adults Protective Services Act. This Act provides for the 24 hour availability of services that safeguard the rights of incapacitated older adults while protecting them from abuse, neglect, exploitation and abandonment. Services include the processing of criminal history background checks for employees and applicants of long term care facilities and the provision of protective service programs offered in each county through the Area Agencies on Aging (AAAs). Other responsibilities include developing policies and procedures, providing technical assistance to the AAAs, conducting perpetrator appeals, staff training, and receiving reports on all types of elder abuse.

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**Endnotes**


\textsuperscript{8} Pennsylvania Health Care Cost Containment Council. (2010). *Inpatient discharge data* [Data file].


\textsuperscript{10} Pennsylvania Coalition Against Rape. *Rape crisis center statistics.* (Fiscal years 2008-2009 to 2011-2012).

\textsuperscript{11} Pennsylvania Coalition Against Rape. *Rape crisis center statistics.* (Fiscal years 2008-2009 to 2011-2012).


Traumatic Brain Injury

According to the CDC, an estimated 1.7 million persons sustain a traumatic brain injury (TBI) in the U.S. each year.\(^1\) The injury may be caused by a bump, blow or jolt to the head, or it may be caused by a penetrating head injury that disrupts the brain’s normal function. Not all blows to the head result in a TBI, which may range in severity from “mild” (e.g., brief change in mental status or consciousness) to “severe” (e.g., extended period of unconsciousness or amnesia following injury). The majority of cases are concussions or other mild TBIs.

Although most cases are mild, TBI is a contributing factor for a third of all injury-related deaths in the U.S.\(^2\) The annual economic cost of TBI in the United States is estimated to be $60 billion.\(^3\)

The U.S. Department of Health and Human Services has set the Healthy People 2020 target for the nation to reduce fatal TBIs to 15.6 per 100,000 population.\(^4\) Pennsylvania has very nearly reached that goal; in 2010, the state’s rate for fatal TBIs was 15.7 per 100,000 population.\(^5\) The Healthy People 2020 target for non-fatal hospitalizations due to TBIs is 77 per 100,000.\(^6\)

Many TBI patients are seen and released from hospital emergency departments without being admitted. Currently, Pennsylvania does not report that data. The Pennsylvania Department of Health’s Violence and Injury Prevention Program and Injury Community Planning Group have a goal to collect this data so that we can gain a better understanding of the extent of TBI incidence in Pennsylvania.

From 2000 to 2010, 194,298 Pennsylvania residents were hospitalized with a diagnosis of TBI. During the first six years of that period, the number of hospitalizations for TBI in the state rose from 15,564 to 19,281, an increase of 23.9 percent. By the end of the decade, the number of cases was down 7.4 percent from the 2006 high; 17,857 cases were reported in 2010.

Figure 6.20 shows the age-adjusted rates of hospitalization for TBI during this time period. The rates of hospitalization for fatal and non-fatal TBIs in Pennsylvania rose from a low of 121.8 per 100,000 population in 2000 to a high of 147 per 100,000 population in 2006 before settling to a rate of 126.5 per 100,000 in 2010.

Figure 6.20 Traumatic Brain Injury Hospitalizations, Pennsylvania, 2000 to 2010\(^7\)
From 2000 to 2010, nearly half of TBI-related hospitalizations were due to falls (47 percent). Other top causes were motor vehicle accidents (33 percent) and “other” causes (20 percent).

**Figure 6.21 Traumatic Brain Injury Hospitalizations by Cause, Pennsylvania, 2000 to 2010**

The mean and median ages of patients hospitalized with TBI in Pennsylvania has steadily increased over the past eleven years. This appears to be due to the fact that falls, the most common cause of TBI in Pennsylvania, occur with higher frequency in the elderly. The mean age of TBI-related hospitalization rose by 18.7 percent from 46.6 years of age to 55.3 years of age, while the median age increased by 28.7 percent from 43 years of age to 58 years of age.

**Figure 6.22 Mean and Median Ages of Traumatic Brain Injuries, Pennsylvania, 2000 to 2010**

In Pennsylvania from 2000 to 2010, the age group with the highest rate for TBI-related hospitalizations (per discharge data) was 85 and older, with a rate of 820.2 TBI-related hospitalizations per 100,000 population. The lowest rate was among children 5 to 14 years of age, with just 59 TBI-related hospitalizations per 100,000 population. In Figure 6.23, note the greater rate among 75 to 84 year olds, as well.
Males comprised nearly 60 percent of all cases in Pennsylvania from 2000 to 2010. Almost 70 percent of TBI-related hospitalizations in persons under the age of 65 years old occurred among males.

As shown in Figure 6.24, the overall age-adjusted rate for males was much higher than the rate for females during every year from 2000 to 2010. As shown in Figure 6.25, this difference persists for all age groups. In general, males tend to have higher rates of TBI-related hospitalizations than females.
Risk Factors

For TBI-related hospitalizations due to falls in Pennsylvania between 2000 and 2010, the highest rates were among residents age 65 and older, rising incrementally from 107.5 per 100,000 population for persons 65 to 74 years old to 696.1 per 100,000 population for those 85 years old and older.

There was a bi-modal distribution for TBI-related hospitalizations due to motor vehicle accidents. The highest rate was among 15 to 24 year olds, with 95.1 cases per 100,000 population. The rate decreased through the 65 to 74 years old category, then rose again to 46.9 per 100,000 population of 75 to 84 year olds.

Table 6.6 Traumatic Brain Injuries by Age and Selected Mechanisms of Injury, Pennsylvania, 2000 to 2010

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Falls Rate per 100,000 population</th>
<th>Motor Vehicle Accident Rate per 100,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 4</td>
<td>46.3</td>
<td>12.0</td>
</tr>
<tr>
<td>5 to 14</td>
<td>14.4</td>
<td>22.2</td>
</tr>
<tr>
<td>15 to 24</td>
<td>16.7</td>
<td>95.1</td>
</tr>
<tr>
<td>25 to 34</td>
<td>16.6</td>
<td>60.9</td>
</tr>
<tr>
<td>35 to 44</td>
<td>22.6</td>
<td>47.0</td>
</tr>
<tr>
<td>45 to 54</td>
<td>37.6</td>
<td>39.8</td>
</tr>
<tr>
<td>55 to 64</td>
<td>54.5</td>
<td>33.5</td>
</tr>
<tr>
<td>65 to 74</td>
<td>107.5</td>
<td>32.4</td>
</tr>
<tr>
<td>75 to 84</td>
<td>313.4</td>
<td>46.9</td>
</tr>
<tr>
<td>85+</td>
<td>696.1</td>
<td>42.2</td>
</tr>
</tbody>
</table>

Note: Hospitalization figures based on inpatient discharge data.
Assaults accounted for 7.3 percent of all TBI-related hospitalizations in Pennsylvania from 2000 to 2010 and were most common among persons in the 15 to 44 years old age category. This group accounted for 67.1 percent of TBI-related hospitalizations during this period. Blacks were more likely than whites to be hospitalized due to an assault-related TBI, with 23.1 percent of cases compared to just 4.6 percent.

Domestic Violence
Traumatic brain injuries may be undiagnosed, underdiagnosed, or misdiagnosed in relation to domestic violence. Abusers often hit victims in the head to conceal visible signs of assault.14 According to two studies published in the 1990s, an estimated 36 percent of domestic violence survivors have sustained injuries to the head, neck or face.15,16 Women seeking medical attention for head, neck and facial injuries were 7.5 times more likely to be survivors of domestic violence than women with other bodily injuries. In one shelter study published in 2002, 92 percent of victims had been hit on the head by abusers, often more than once. These victims reported worsening symptoms as the number of assaults to the head increased. Eighty-three percent of these victims had been hit on the head and severely shaken, and eight percent had been hit more than twenty times in the past year.17

Mechanisms of traumatic brain injury among domestic violence victims include being shaken, hit on the head, pushed, thrown, slammed against a wall or other hard surface to hit the head, and shot or stabbed in the head. Other TBI causes include means of attack that result in a state of oxygen deprivation such as smothering, drowning or strangling a victim.18

Cost of Hospitalization
The median charge of hospitalization due to TBI in Pennsylvania from 2000 to 2010 was $24,741. Falls and motor vehicle-related TBI hospitalizations were associated with the greatest percent of the total charges, accounting for approximately 80 percent of the total charges. Although there were fewer cases of TBI hospitalizations due to motor vehicle accidents than falls, motor vehicle accidents had a higher median charge ($27,577) compared to falls ($23,382).

Between 2000 and 2010, the median charges for hospitalizations of TBI due to falls and motor vehicle accidents increased by 200 and 211 percent, respectively.

<table>
<thead>
<tr>
<th>Cause of TBI</th>
<th>Number of Cases</th>
<th>Median Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>194,298</td>
<td>$24,491</td>
</tr>
<tr>
<td>Falls</td>
<td>87,286</td>
<td>$23,382</td>
</tr>
<tr>
<td>Motor vehicle accidents</td>
<td>63,448</td>
<td>$27,577</td>
</tr>
</tbody>
</table>

TBI-Related Fatalities
Data from 2000 to 2010 show that males have the highest TBI-related death rates across all age groups. Age, however, exerts more influence over rates of TBI-related deaths in Pennsylvania, with the highest rate occurring among adults aged 85 and older at 93.2 deaths per 100,000 population. The rate is second highest for those between the ages of 75 and 84 years old, at 48.1 per 100,000 population. Rates were also high for adults 65 to 74 years old, at 20 per 100,000. See Figure 6.26 for details.
Intervention Strategies

**Advisory Board:** Pennsylvania’s Secretary of Health established the Traumatic Brain Injury Advisory Board in August 2001 to meet the requirement of the U.S. Health Resources and Services Administration’s Federal TBI Planning Grant and the Federal TBI Act of 1996. The Board consists of 26 members, one-third of whom (nine members) must have either sustained a brain injury or had a family member who suffered a brain injury. The mission of the TBI Advisory Board is to:

- Assist the Department of Health and other state agencies to develop services and programs to provide a higher quality of life for TBI survivors
- Serve as an educational resource for TBI survivors and their families
- Raise public awareness of TBI
Child Care Connection: The Pennsylvania chapter of the American Academy of Pediatrics (AAP), Early Childhood Education Linkage System (ECELS) provides health and safety technical assistance as well as professional development and coordination of resources for child care providers, health professionals, and others who work with child care programs. In partnership with the state Department of Health, ECELS has developed an online, independent-study module and in-person workshop to teach child care providers about traumatic brain injury in young children. The information in its module covers risk reduction, recognizing and responding to signs and symptoms of a head injury, and accommodating the needs of a child in group care with a brain injury. The module is available online at http://www.paaap.org/headbumpsmatter/Headbumpsmatter.htm

Shaken Baby Syndrome: Infants may suffer TBI when a parent of caregiver shakes them in response to crying. The Pennsylvania Shaken Baby Syndrome Prevention and Awareness Program is administered by the Penn State Hershey Medical Center in cooperation with the Pennsylvania Department of Health in order to educate parents on how to deal with the frustration of a crying baby and equip them with effective parenting and coping strategies. Three nurse-coordinators operate the program, providing guidance and support to all of the children’s hospitals, birthing hospitals and free-standing birth centers in the state. They provide formal in-service training for nursing and hospital staff regarding the guidelines and community standards of nursing practice necessary for compliance with Pennsylvania Law 2002-176: The Shaken Baby Syndrome Education Act.

Endnotes


