

Injury and Violence in Michigan

Michigan's Core Violence and Injury Prevention Program Burden Report



Injury and Violence Prevention Section
Michigan Department of Health and Human Services

2018

“If a disease were killing our children in the proportion that injuries are, the public would be outraged and demand that this killer be stopped.”

C. Everett Koop, M.D.
U.S. Surgeon General, 1982-1989

“The landmarks of political, economic and social history are the moments when some condition passed from the category of the given into the category of the intolerable.....I believe that the history of public health might well be written as a record of successive re-definings of the unacceptable.”

Sir Geoffrey Vickers, a British industrialist in his 1958 paper, "What Sets the Goals of Public Health?"

Foreword

Exposure to trauma and injury can have profound long-term consequences. Studies support that exposure to violence and trauma correlate so closely with long term poor health outcomes and chronic disease that it is often predictive.¹ These same studies highlight shared risk and protective factors that many types of injuries have that co-exist with other poor health outcomes. Public Health approaches endeavor to re-frame public perception of injuries; unintentional as well as intentional, as very preventable, as opposed to inevitable life experiences.

The more we learn about injuries, how and where they happen, circumstances that lead to them as well as conditions and mechanisms, the more apparent it becomes that they are in fact, avoidable. Better information and data collection are needed to describe incidents of injury, and to facilitate the development of appropriate interventions and education to eliminate these very preventable outcomes.

Eden V. Wells, MD, MPH, FACPM

Chief Medical Executive

Michigan Department of Health and Human Services

Note: For more information about injury and violence prevention activities within Michigan, visit www.michigan.gov/injuryprevention.

¹ CDC-Kaiser Permanente Adverse Childhood Experiences (ACE) Study, 1998
The Toll of Injury and Violence in Michigan, March 2018

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Executive Summary

Injuries are a substantial public health concern nationally and in Michigan. Injuries alone accounted for 58,420 hospitalizations in 2015 in the state, and Michigan has averaged 6,196 injury-related deaths between 2006 and 2015 each year. This means that on an average day over this decade, 160 people were hospitalized, and 17 people died in Michigan from an injury. Injuries are a leading cause of death and disability. An estimated 1.4 million people in Michigan live with a disability.² The estimated years of potential life lost (YPLL) before the age of 80 in Michigan in 2015 was 126,954, just for unintentional injuries. An additional 47,588 YPLL are estimated for suicide, and 27,052 YPLL for homicide.³ Besides the physical and emotional trauma that families endure, injuries come with a great financial cost. Lifetime medical and work-loss costs for unintentional and intentional injuries combined were estimated at more than 7.5 billion dollars for Michigan in 2014.⁴

On an average day **160** people were hospitalized and **17** people died in Michigan from an injury.

Injuries are the leading cause of death for Michigan residents between the ages of 1 to 49 years of age (2015).⁵ Across different age groups, the leading injury-related causes of death are:

- Sleep-related deaths for infants under the age of 1
- Homicide for children between the ages of 1 and 4
- Motor vehicle crashes for people between the ages of 5 and 24
- Poisoning for people between the ages of 25 to 54
- Suicide for 55 to 64-year-olds
- Falls for people age 65 and over

Every year injuries contribute to new numbers of people living with a disability. Injuries kill more Americans in the first half of life (1-44 years old) than any other cause, including cancer, HIV or the flu.⁶

² United States Census Bureau, 2012-2016 American Community Survey. A number of different non-injury causes (or a combination of them) can lead to disability, including congenital disorders and disease.

³ Centers for Disease Control and Prevention, National Center for Health Statistics, Vital Statistics System

⁴ Centers for Disease Control and Prevention, Costs of Fatal Injuries for States in 2014 – All Injuries

⁵ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

⁶ Centers for Disease Control and Prevention. About CDC's Injury Center: Violence and Injuries Affect Everyone. www.cdc.gov/injury/about/index.html. Accessed July 27, 2017.

About This Report

This report describes the extent to which the leading types of injury occur in Michigan on a statewide scale. Further analysis is encouraged to explore where the burden of injury and death may be higher for people by race, ethnicity, sex, gender identity, age, and geography, by type of injury, where data is available.

The purpose of this report is to highlight morbidity and mortality in Michigan related to four core injury and violence focus areas:

- Traumatic brain injuries (TBI)
- Motor vehicle crashes (MVC)
- Child abuse and neglect (CAN)
- Intimate partner/sexual violence (IP/SV)

The report also seeks to highlight the impact of five other leading types of injury and violence in Michigan by age group:

- Falls
- Unintentional suffocations
- Homicides
- Suicides
- Poisonings

How to Use This Report

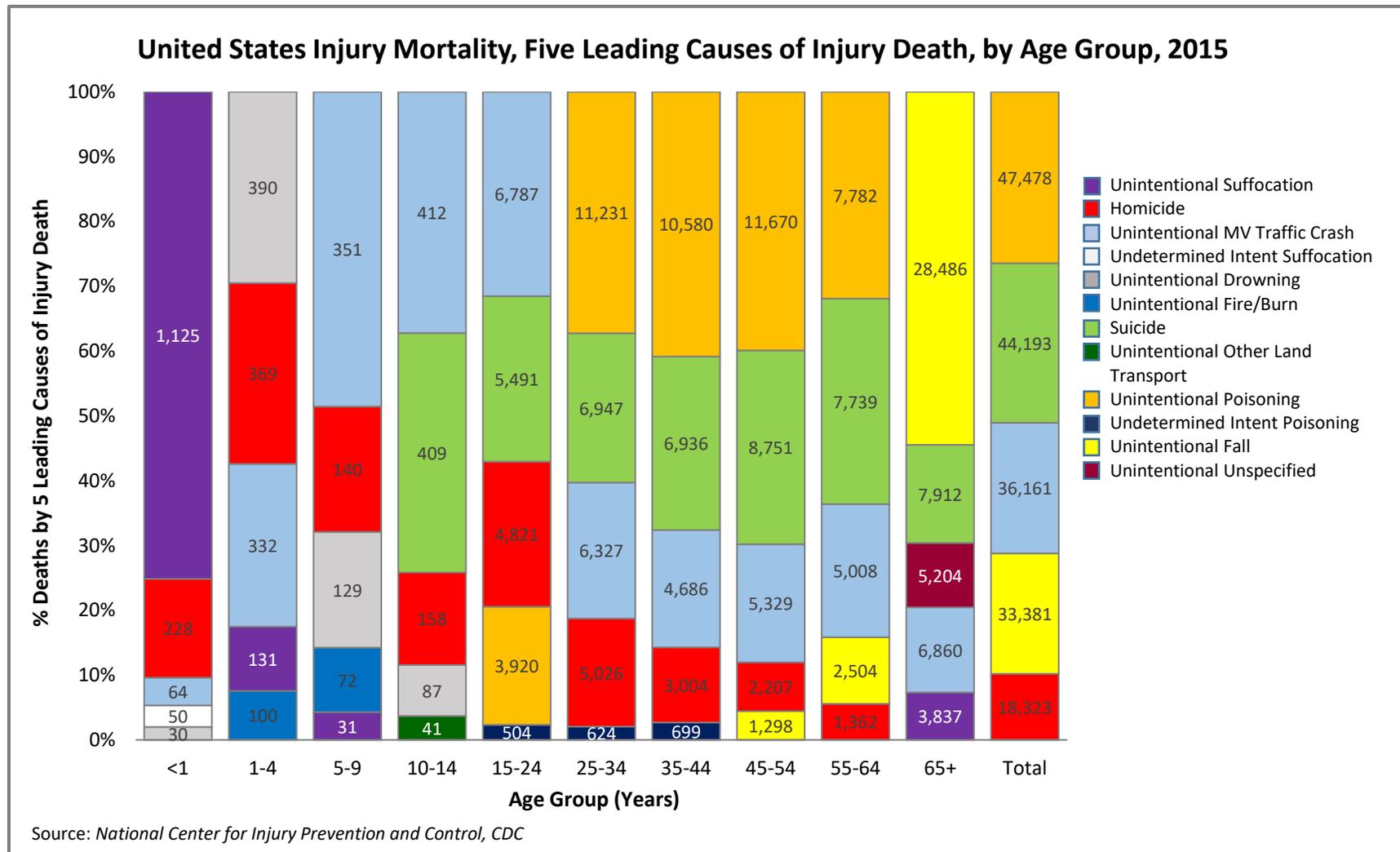
The report's primary goals:

- Provide information on the type and extent of the leading types of injury and violence place on Michigan families and communities.
- Help public health officials and other stakeholders identify priorities and promote the creation of data-driven, evidence-based injury and violence prevention programming and initiatives.
- Establish a baseline by which to evaluate the relative progress or success of statewide programming and initiatives moving forward.

The report also can be used to:

- Raise awareness among:
 - local public officials, community leaders, and faith-based leaders,
 - members of the public,
 - public and medical health care professionals,
 - school officials, educators, and staff members,
 - state legislators, and public officials and other policymakers at both the state and local level.
- Provide a verifiable source of information to members of the media.
- Guide the allocation of public health and community resources earmarked for injury and violence prevention efforts.
- Provide background information and data for grant applications to fund injury and violence prevention programming and initiatives.
- Create a platform from which to provide more detailed analysis of injury and population data.

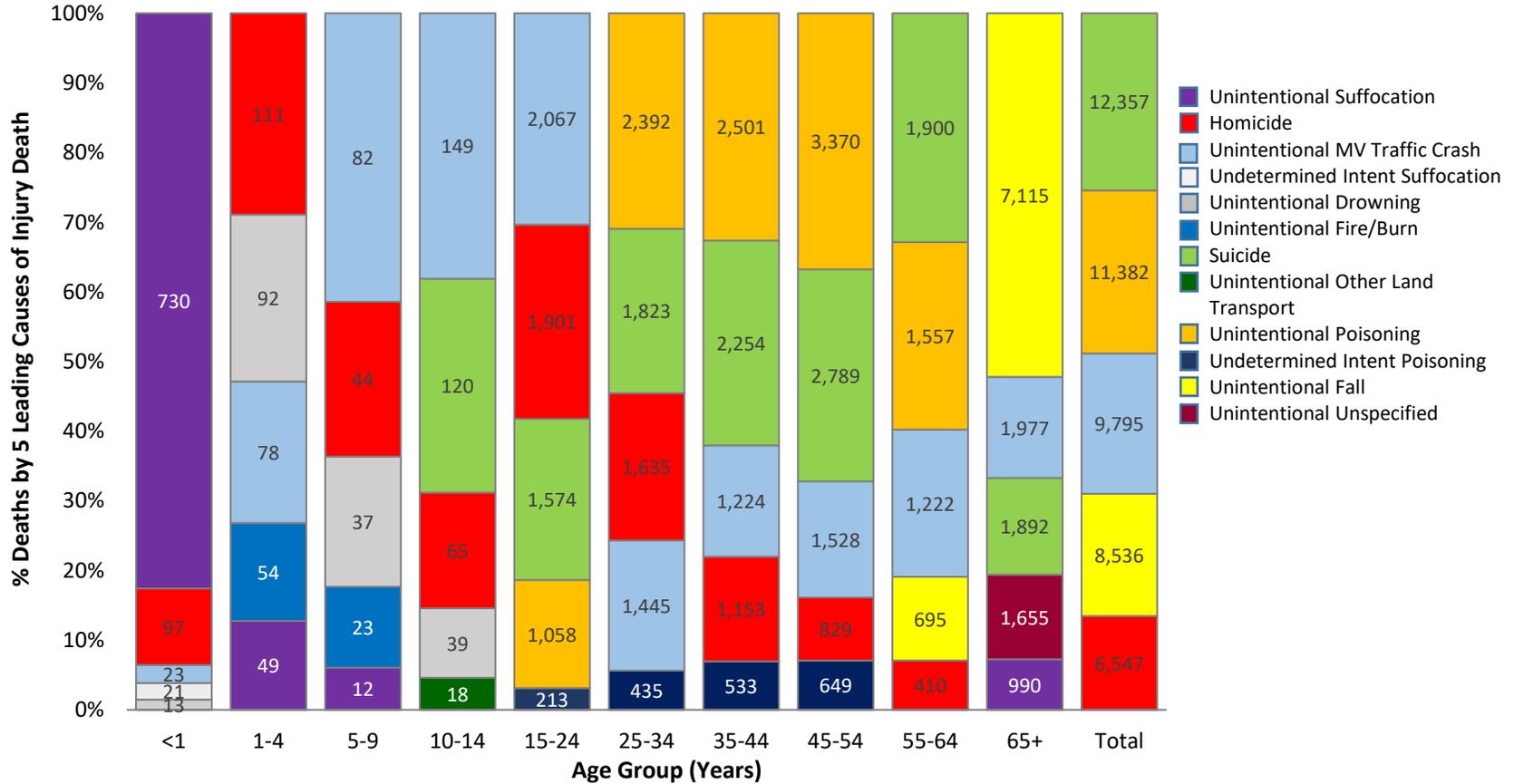
How Michigan Compares to the Country as a Whole



U.S. data highlights from this table

- Nationally, the leading injury-related cause of death in 2015 was unintentional poisoning for all ages combined. This is reflective of the opioid crisis that our country is facing.
- Suicide was the second most frequent injury-related cause of death in 2015 across all ages combined, and was the second most frequent injury-related cause of death for ages 10 and over.
- Motor vehicle crash deaths were the third most frequent injury-related cause of death across all ages, but was most frequent for the 5-24 -year old population.
- While sleep-related deaths were the most frequent injury-related cause of death for children under the age of 1, unintentional suffocation is among the top five injury-related cause of death for children between the ages of 1 and 9, and for 65+ adults.
- Unintentional falls is not only the leading injury-related cause of death for the 65+ population, but these occurred in 2015 at a frequency that is 3.6 times higher than the next leading injury-related cause for this age group. It is the fourth leading injury cause of death for all age groups combined.
- Homicide is the fifth leading injury-related cause of death in America across all ages, but the second for children age 9 and under.

Michigan Resident Injury Mortality, Five Leading Causes of Injury Death, by Age Group, 2006-2015

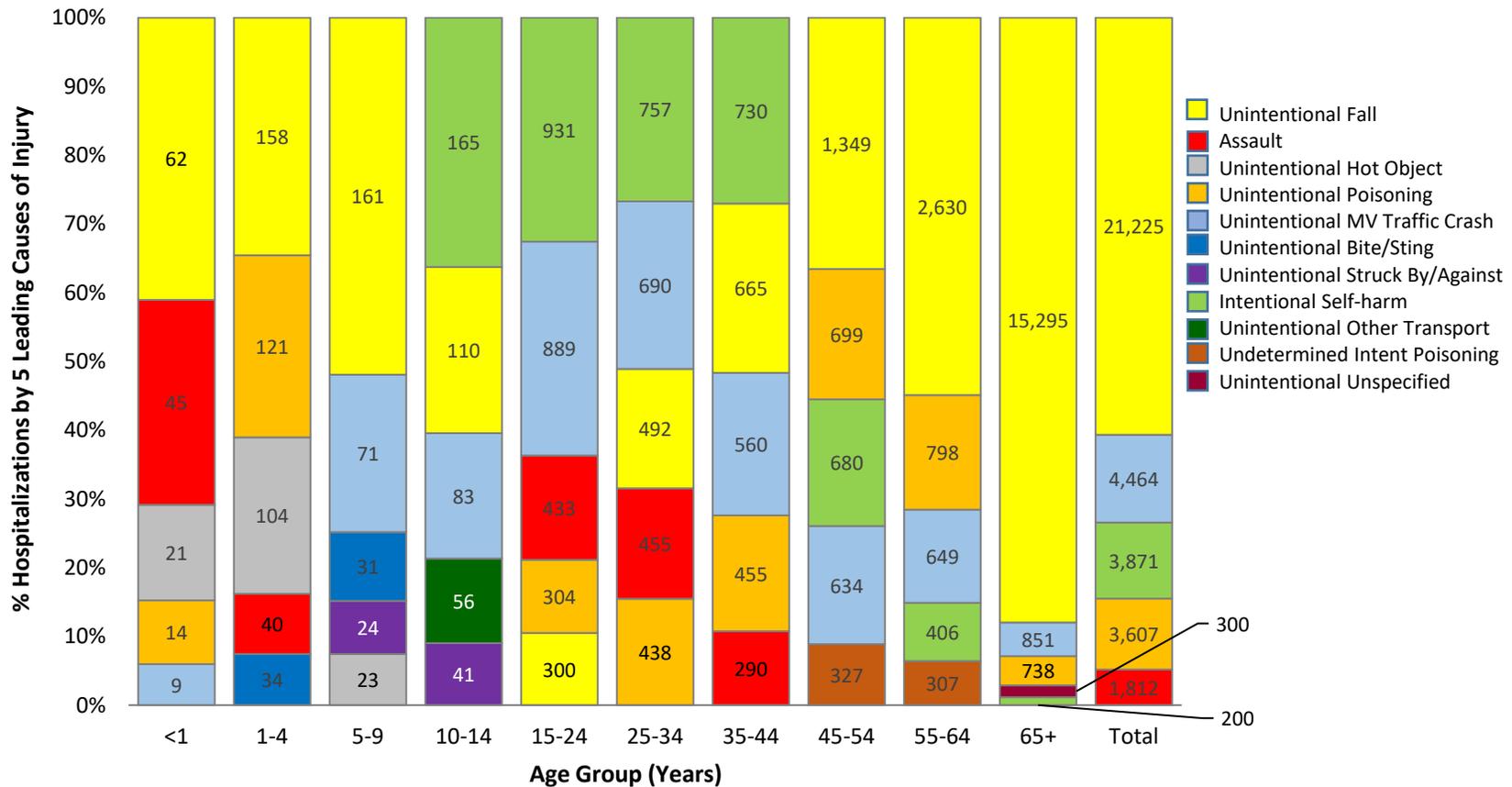


Source: Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

While aggregate data for Michigan over the past 10 years closely mirrors the 2015 leading causes of injury-related deaths nationally, there are some distinctions:

- Homicide was the most frequent injury-related cause of death for children ages 1 to 4 in Michigan.
- Suicide was the leading injury-related cause of death for adults between the ages of 55 to 64, and the most frequent cause of injury-related death for all ages combined for the state.

Michigan Resident Injury Hospitalizations, Five Leading Causes of Injury, by Age Group, FY2015 (Oct 2014-Sep 2015)



Source: Michigan Inpatient Database (MIDB)

Michigan injury-related hospitalizations

- From available data, unintentional falls is the most frequent leading cause for injury-related hospitalizations with nearly five times the number of injuries over the next leading cause, which is motor vehicle crashes for all ages combined.
- Intentional self-harm is the leading injury-related cause for hospitalization for ages 10 to 44.

Four Core Areas of Injury and Violence in Michigan

The Michigan Department of Health and Human Services (MDHHS), Injury and Violence Prevention Unit, Division of Chronic Disease and Injury Control, was awarded a grant to implement the Core State Violence and Injury Prevention Program (Core SVIPP) from the U. S. Centers for Disease Control and Prevention (CDC) in 2016. The overall purpose of this five-year grant is to 1) decrease and prevent injury and violence-related morbidity and mortality and 2) increase sustainability of injury prevention programs and practices. The following four core areas are the grant's focus:

Traumatic Brain Injuries

Traumatic brain injuries, or TBIs, are a type of injury that affects the function or mechanics of the brain. Although all other areas of injury in this report focus on either different causes or intent for injury and death, many of which can result in a TBI, this type of injury is uniquely highlighted because of its magnitude and consequences. Traumatic brain injuries contribute to a substantial number of deaths and cases of permanent disability. On average, more than 29 people died every week in Michigan in 2015 from a TBI. Nearly seventy-five percent of these fatalities were men, and nearly forty-five percent of these fatalities were firearm related.⁷

More than **29** people died in an average week from a traumatic brain injury in Michigan in 2015.

Unintentional Motor Vehicle Crashes

Motor vehicle crashes in this report include unintentional incidents of injury and death for motor vehicle occupants as well as bicyclists and pedestrians. Motor vehicle crash deaths in Michigan are highest for males between the ages of 15 to 34 and are the leading injury-related cause of death for ages 5 to 24. The rate of motor vehicle crash deaths for males is nearly triple the rate for females overall. Over the past 10 years, nearly 19 people died in a motor vehicle crash every week on average in Michigan. More than 74 people were hospitalized in an average week between October 2014 and September 2015 in the state from injuries sustained in a motor vehicle crash.⁸

Child Abuse and Neglect

Child abuse is harm or threatened harm to a child's health or welfare through non-accidental physical or mental injury, sexual abuse, sexual exploitation, or maltreatment by a parent, legal guardian or any other person responsible for the child's health or welfare. Neglect is harm or threatened harm to a child's health or welfare through negligent treatment, placing a child at an unreasonable

⁷ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

⁸ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

risk or failing to intervene to eliminate that risk when that person is able to do so and has, or should have, knowledge of the risk. There are many forms of child abuse and neglect. This injury area is challenging to quantify, as it cannot be assumed that all incidents of abuse and neglect are identified or reported. Homicide is the leading cause of injury-related death in children between the ages of 1-4 in Michigan, and it is the second cause for this age group nationally. It is the second leading cause of injury-related death for children under one and between the ages of 5 to 9, and third leading cause of injury-related death for children between the ages of 10 to 14 in Michigan. There were 51 homicide injury deaths among children age 17 and under in Michigan in 2016; averaging nearly one death a week. It is important to point out that not every youth homicide is classified as abuse or neglect; this is determined by the relationship of the perpetrator to the victim. Assaults or intentional harm are the second most frequent cause for injury-related hospitalization for children under the age of 1 in Michigan.⁹

Intimate Partner/Sexual Violence

The Centers for Disease Control and Prevention describes Intimate Partner Violence as a serious, preventable public health problem that affects millions of Americans. It is defined as physical violence, sexual violence, stalking and psychological aggression (including coercive acts) by a current or former intimate partner. Sexual violence is defined as a sexual act committed against someone without that person's freely given consent.¹⁰ More than twenty-five percent of women in Michigan report having been raped in their lifetime (this includes perpetrators who may be known or unknown to them).¹¹ The same study reports that nearly forty-two percent of women in Michigan experience rape, physical violence and/or stalking in their lifetime. This area of injury is also under reported and very challenging to quantify. Not all victims seek medical care or help from law enforcement, and it cannot be assumed that all who seek medical care disclose the nature, cause or extent of their injuries. Given that there are limitations with the vital records and hospitalization data to describe the burden of this injury area, other sources of data are sought to help describe this serious problem. These include surveys, such as the Youth Risk Behavior Surveillance System, the National Intimate Partner and Sexual Violence Survey (NISVS), and crime statistics.

⁹ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

¹⁰ CDC, National Center for injury Prevention and Control

¹¹ National Intimate Partner and Sexual Violence Survey, 2010 Report

Traumatic Brain Injuries

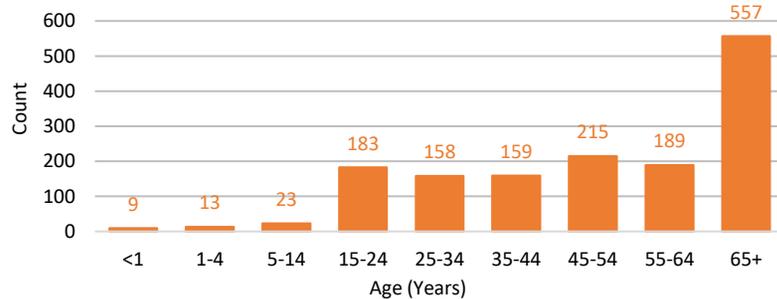
Deaths and Non-Fatal Hospitalizations

Michigan Residents, 2006-2015

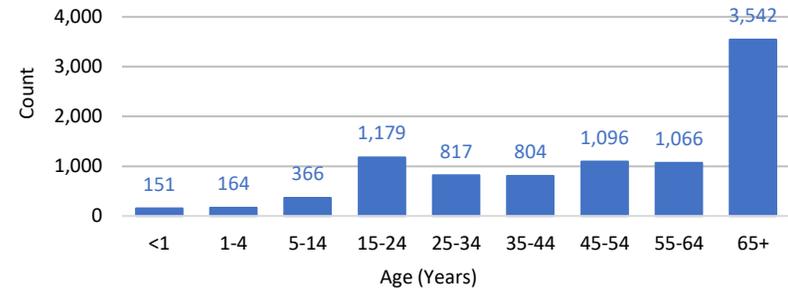
What you should know about traumatic brain injuries: Between 2006 and 2015, there were 15,057 TBI deaths in Michigan; more than one-third of these occurred in people who were age 65 and over. There were more than six times as many hospitalizations for traumatic brain injuries during the same time frame – 91,842 across

all ages. Traumatic brain injury data includes intentional and unintentional injuries, as well as multiple injury mechanisms; separately described in this report (including but not limited to motor vehicle crashes, falls, self-harm and assault).

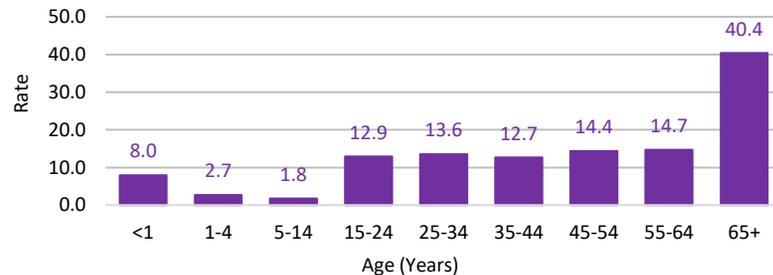
Average Annual Number of Deaths*
(All Ages = 1,506)



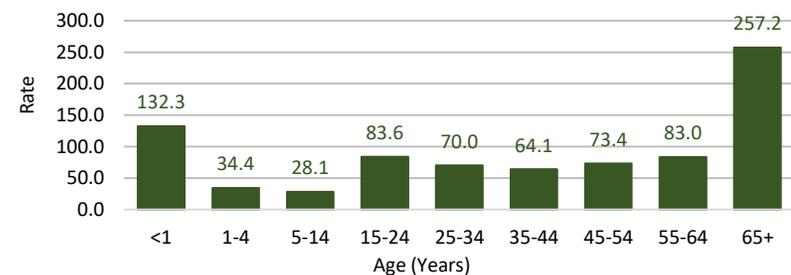
Average Annual Number of Hospitalizations*
(All Ages = 9,184)



Average Annual Death Rate**
(All Ages = 15.2)



Average Annual Hospitalization Rate**
(All Ages = 93.0)



*Cases identified by searching all contributing cause of death fields for an ICD10 code in the following range: S01.0-S01.9, S02.0, S02.1, S02.3, S02.7-S02.9, S04.0, S06.0-S06.9, S07.0, S07.1, S07.8, S07.9, S09.7-S09.9, T01.0, T02.0, T04.0, T06.0, T90.1, T90.2, T90.4, T90.5, T90.8, T90.9.

**Rate = number of deaths per 100,000 population per year

*Cases identified via the following diagnosis codes found in any diagnostic field: 800, 801, 803, 804, 850-854, 950.1-950.3, 959.01, 995.55 (ICD9CM); S02.0XXA, S02.0XXB, S02.1XXA, S02.1XXB, S02.8XXA, S02.8XXB, S02.91XA, S02.91XB, S04.02XA, S04.03XA, S04.04XA, S06.XXXA, S07.1XXA (where "X" indicates any valid character) (ICD10CM).

**Rate = number of hospitalizations per 100,000 population per year

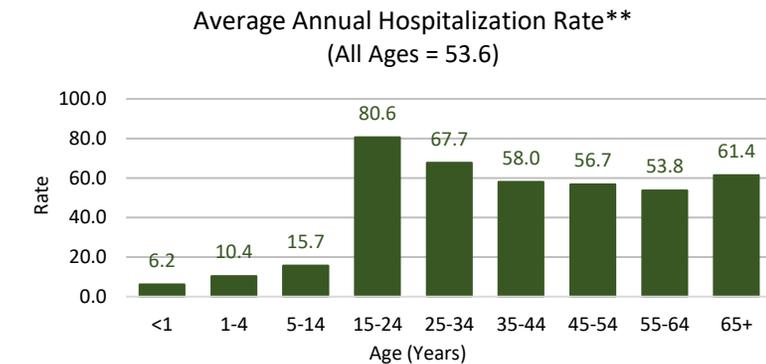
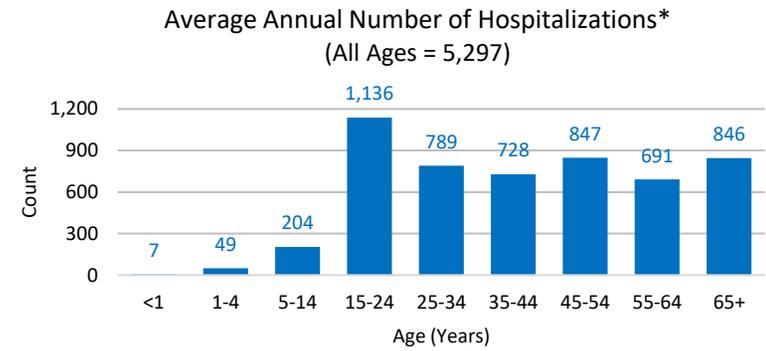
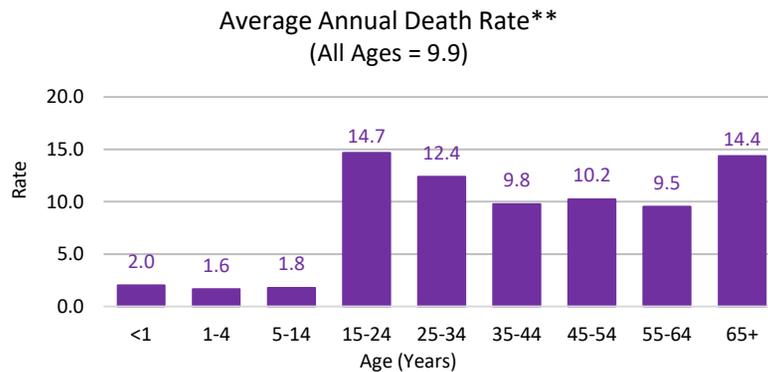
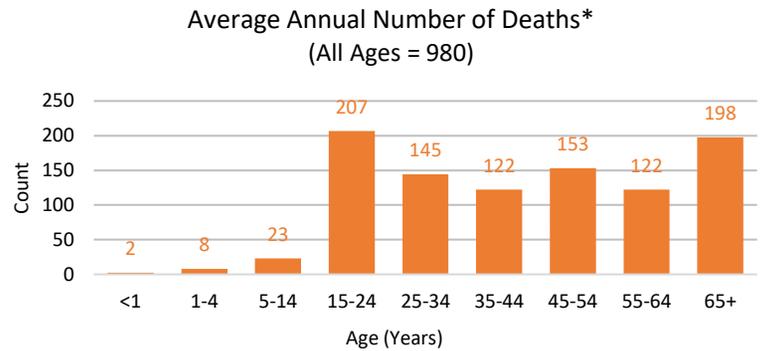
Unintentional Motor Vehicle Crashes

Deaths and Non-Fatal Hospitalizations

Michigan Residents, 2006–2015

What you should know about unintentional motor vehicle crashes: Data includes unintentional motor vehicle crash occupants as well as those that involve pedestrians, cyclists, or those injured who were not occupants of the vehicle. Motor vehicle crash deaths are the leading cause of injury-related death for those between the

ages of 5–24 nationally as well as in Michigan. It is the third leading cause of injury deaths across all ages in the state. Injuries from motor vehicle crashes are the leading cause for injury-related hospitalizations for those between the ages of 10 and 24 in Michigan.



*Cases identified via underlying cause of death (ICD-10-CM codes V30-V39 [4-.9], V40-V49 [4-.9], V50-V59 [4-.9], V60-V69 [4-.9], V70-V79 [4-.9], V81.1 V82.1, V83-V86 [0-.3], V20-V28 [3-.9], V29 [4-.9], V12-V14 [3-.9], V19 [4-.6], V02-V04 [1.,9], V09.2, V80 [3-.5], V87[0-.8], V89.2)

**Rate = number of deaths per 100,000 population per year

*Cases identified via cause of injury (ICD-9-CM codes E810-E819; ICD-10-CM codes V30-V39 [4-.9], V40-V49 [4-.9], V50-V59 [4-.9], V60-V69 [4-.9], V70-V79 [4-.9], V81.1, V82.1, V83-V86 [0-.3], V20-V28 [3-.9], V29 [4-.9], V12-V14 [3-.9], V19 [4-.6], V02-V04 [1.,9], V09.2, V80 [3-.5], V87[0-.8], V89.2)

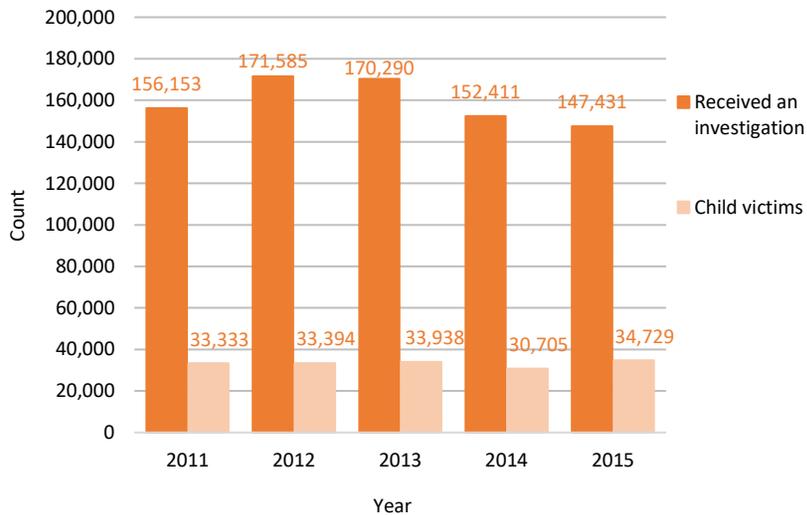
**Rate = number of hospitalizations per 100,000 population per year

Child Abuse and Neglect Incidence Reporting Michigan Residents, 2011-2015

What you should know about child abuse and neglect: On average, 20 percent of investigated cases identify at least one child

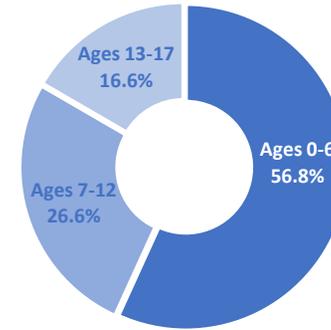
victim. Over half of child victims are under the age of 7. The perpetrator in over 80 percent of the cases is the child's parent.

Annual Number of Children who Received an Investigation and Child Victims*

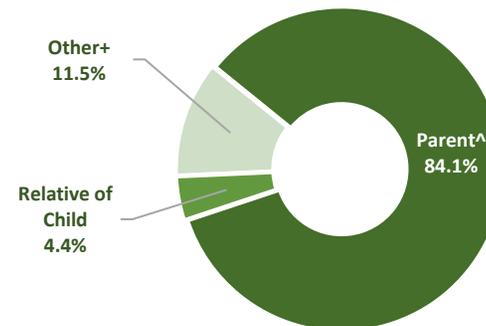


*Victims in cases identified as Child Protective Services investigations that resulted in disposition of Category I, II or III
Counts reflect number of children for whom an investigation was assigned – a child may have received more than one investigation.

Child Victims by Age, 2015



Perpetrator Relationship* to Victim, 2015



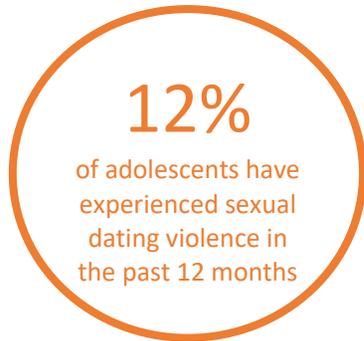
^ Adoptive, Biological, Step, and Putative Parent
+ Foster sibling, Foster parent, Guardian, Legal guardian, Not related
* Perpetrators are counted separately for each victim and may be counted multiple times if they are the perpetrator of multiple victims

Intimate Partner/Sexual Violence Incidence Reporting Michigan Residents, dates vary by source

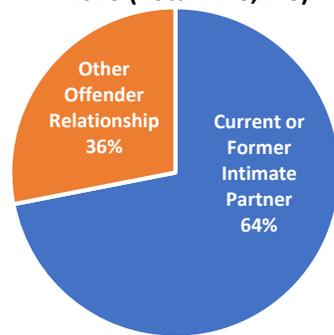
What you should know about intimate partner/sexual violence: Reports indicate that intimate partner violence begins early; more than one in 10 high school adolescents report they have experienced recent dating violence. More than four out of 10 women and one in 5 men report that they have experienced some

form of violence from an intimate partner during their lifetime. More than 25 percent of women in Michigan report having been raped during their lifetime (this includes perpetrators who may be known or unknown to them).

High School Youth Risk Behavior Survey, 2015

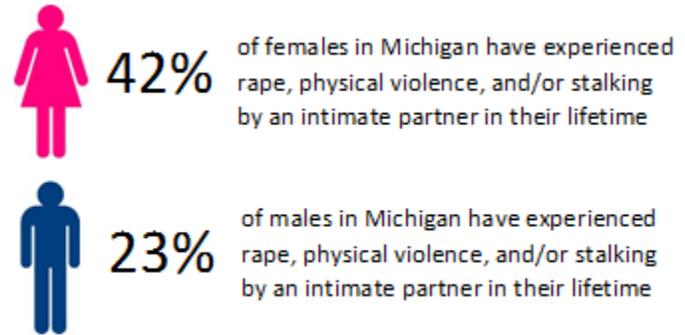


Domestic Violence Victim[^] to Offender Relationship, 2015 (Total = 78,118)



[^]Victims from the Michigan State Police 2015 reports for incidents of domestic violence, who were 18 years or older

National Intimate Partner and Sexual Violence Survey, 2010 Report



Other Leading Causes of Injury and Violence in Michigan

Unintentional Falls

Falls can result in serious injury across all ages, and are a significantly more serious risk for older adults. Fall injuries can result in broken bones, including arm, hip and wrist fractures, as well as traumatic brain injuries and death. Four out of 10 hospitalizations for a traumatic brain injury are caused by a fall, and nearly 27 percent of traumatic brain injury fatalities are caused by a fall. Other types of injuries sustained in a fall may also lead to hospitalization and death. In an average week in 2015, 418 people were hospitalized and 17 people died because of a fall injury in Michigan.¹²

Unintentional Suffocations

Suffocation deaths are represented by two major causes: 1) the inhalation or ingestion of food or other objects that block respiration and 2) other mechanical means that hinder breathing (such as a plastic bag over the mouth and nose, suffocation by bedding, and unintentional or intentional hanging or strangulation). Only unintentional suffocations are included under this category; if the incident was conclusively intentional, it is included with either incidents of homicide or suicide. Suffocation, or sleep-related death is the leading injury-related cause of death for infants under one year of age. An average of six infants die every month in Michigan from suffocation due to an unsafe sleep environment. Incidents of unintentional suffocation death increase again for the older adult population.¹³

Homicides

The Centers for Disease Control and Prevention defines homicide as a death resulting from the use of physical force or power, threatened or actual, against another person, group or community when a preponderance of evidence indicates that the use of force was intentional. It is one of the top five leading causes of injury-related deaths in Michigan for most of the age categories, and is the leading injury-related cause of death for children in the 1-4 age group. Incidents of homicide were more than four times greater for men (485 deaths) overall than women (115 deaths) in Michigan in 2015.¹⁴

Suicides

Suicide was the leading injury-related cause of death to people in Michigan using data aggregated from 2006 to 2015 and is a tremendous public health concern. Suicide is the second leading cause of death nationally. This state has averaged three suicide

¹² Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

¹³ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

¹⁴ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

deaths a day between 2006 and 2015. There were nearly four hospitalizations from a self-inflicted injury for every suicide death over the same period. People age 35 to 54 accounted for over 40 percent of the suicide deaths. Between 2006 and 2015, the use of a firearm was the mechanism for suicide 49.7 percent of the time, and hanging, strangulation or suffocation accounted for 25.8 percent of the suicide deaths. Suicide deaths were three times more frequent among males (1,089 deaths) than females (301 deaths) in 2015 in Michigan.¹⁵ Further review of available data is recommended for all areas of injury. While suicide deaths are higher for males, data from 2015 shows that females are hospitalized 1.5 times more than males for self-harm injuries. Mortality data shows that incidents of suicide increase with the 10-14 age group.¹⁶

Poisonings

Unintentional poisonings have risen to become the leading injury-related cause of death in the country. It is the leading injury-related cause of death for people between the ages of 25 to 54 in Michigan, and second leading cause overall, using aggregated data from 2006 to 2015. This category captures all manner of poisonings, including insect bites or stings, ingestion or exposure to toxic or harmful substances, and illicit, prescription or other drug overdoses. The rise in this injury area is due to the opioid epidemic that is being realized both nationally and in Michigan. More than 30 people died in an average week from poisoning between 2006 and 2015 in Michigan. During this time frame, 90.3 percent of all fatal poisonings were drug-related, and include intentional and unintentional poisonings.¹⁷

¹⁵ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

¹⁶ Incidents of suicide may not be accurately captured for children under the age of 10

¹⁷ Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services

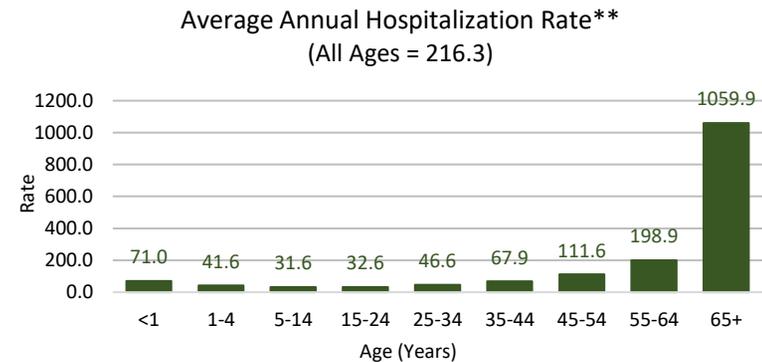
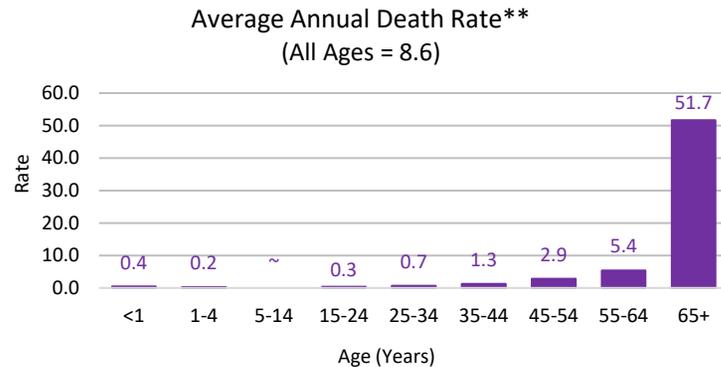
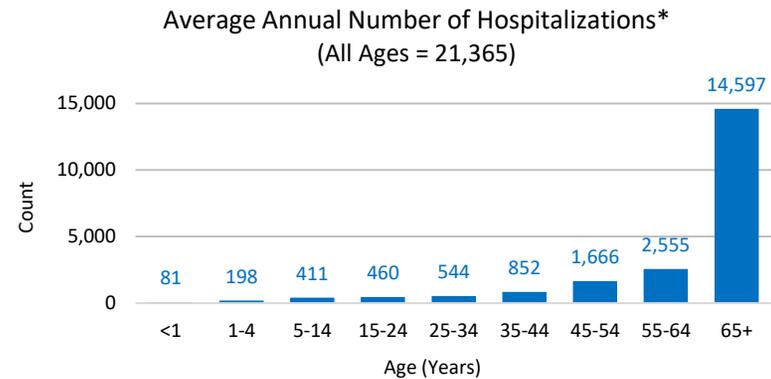
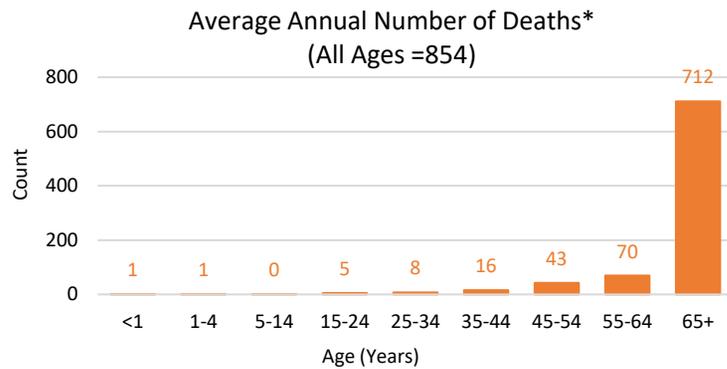
Unintentional Falls

Deaths and Non-Fatal Hospitalizations

Michigan Residents, 2006-2015

What you should know about unintentional falls: Nationally and in Michigan, most unintentional fall-related hospitalizations and deaths occur among the 65 and older population. More than 85

percent of all unintentional fall deaths between 2006 and 2015 occurred in people who were 65 and older.



*Cases identified via underlying cause of death (ICD-10-CM codes W00-W19)
 **Rate = number of deaths per 100,000 population per year
 ~Rate could not be calculated

*Cases identified via cause of injury (ICD-9-CM codes E880-E886, E888; ICD-10-CM codes V00111, V00121, V00131, V00141, V00151, V00181, V00211, V00221, V00281, V00311, V00321, V00381, V00811, V00821, V00831, V00891, W00-W19)
 **Rate = number of hospitalizations per 100,000 population per year

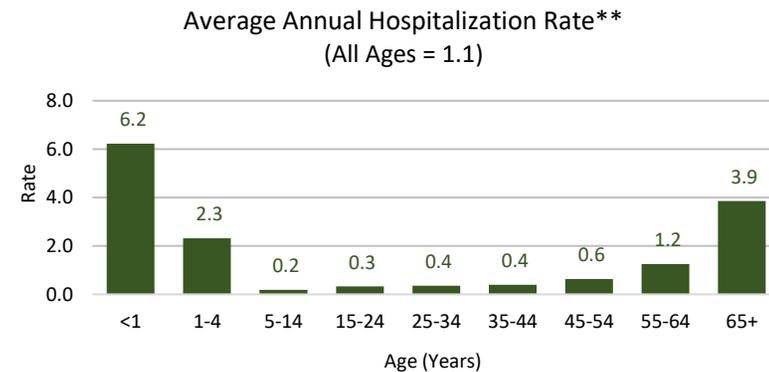
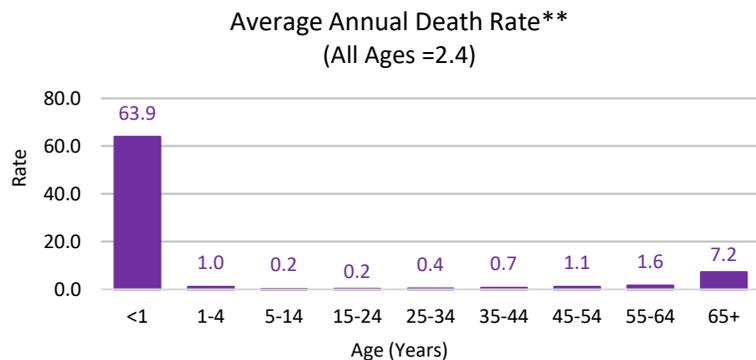
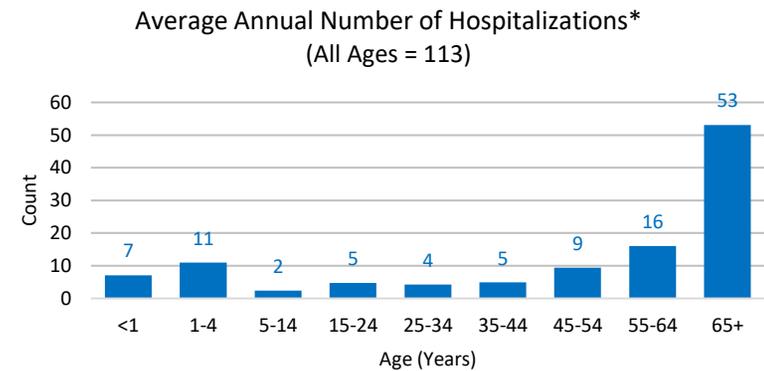
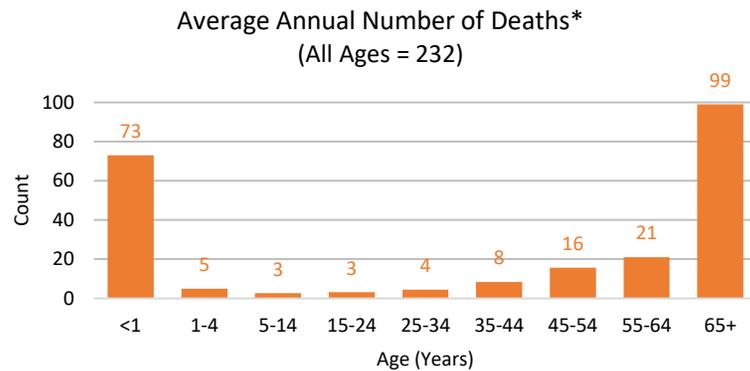
Unintentional Suffocations

Deaths and Non-Fatal Hospitalizations

Michigan Residents, 2006-2015

What you should know about unintentional suffocations:
 Suffocation is highest in occurrence for infants under the age of 1 and older adults, however the rate of suffocation is highest for infants. Sleep-related deaths account for nearly 75 percent of all

injury-related deaths in children under the age of 1. Fatalities are 10 times higher than incidents of hospitalizations for infants, and nearly twice as high for older adults.



*Cases identified via underlying cause of death (ICD-10-CM codes W75-W84)
 **Rate = number of deaths per 100,000 population per year

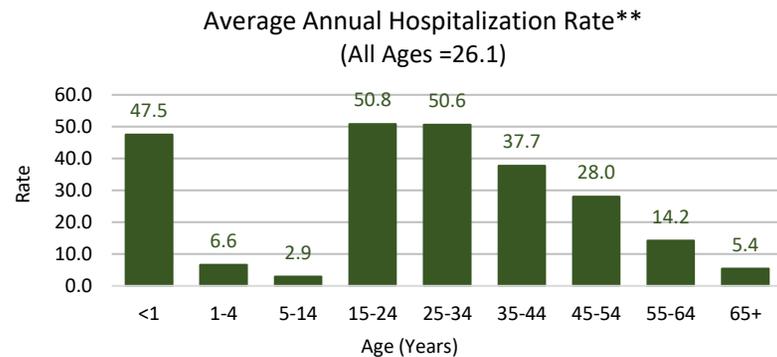
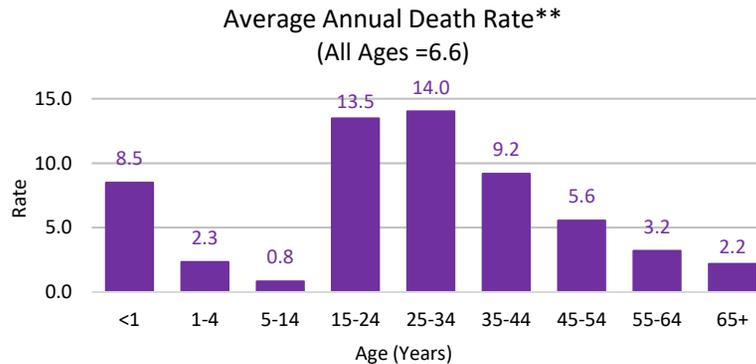
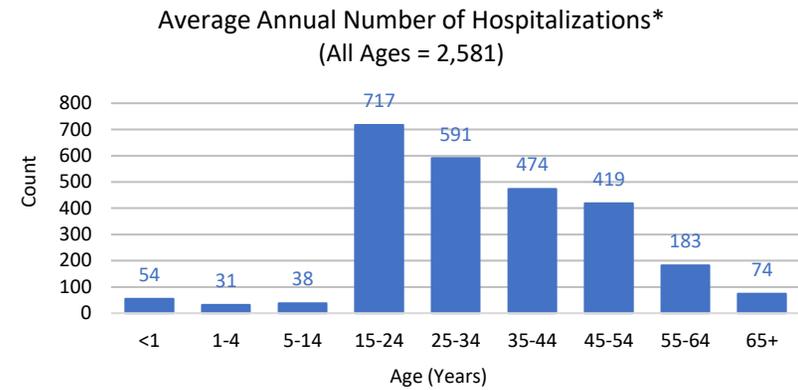
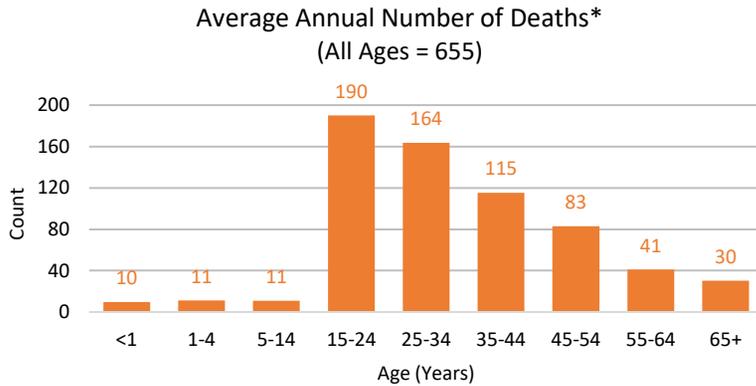
*Cases identified via cause of injury (ICD-9-CM codes E911-E913; ICD-10-CM codes T17, T71)
 **Rate = number of hospitalizations per 100,000 population per year

Homicides

Deaths and Non-Fatal Assault Hospitalizations Michigan Residents, 2006-2015

What you should know about homicides: The incidence of homicide rises abruptly for the 15 to 24 age group. The homicide death rate and the hospitalization rate for non-fatal assaults is

highest for those between ages 15 to 44, as well as for those under 1 year of age.



*Cases identified via underlying cause of death (ICD-10-CM codes X85-Y09, Y87.1)
**Rate = number of deaths per 100,000 population per year

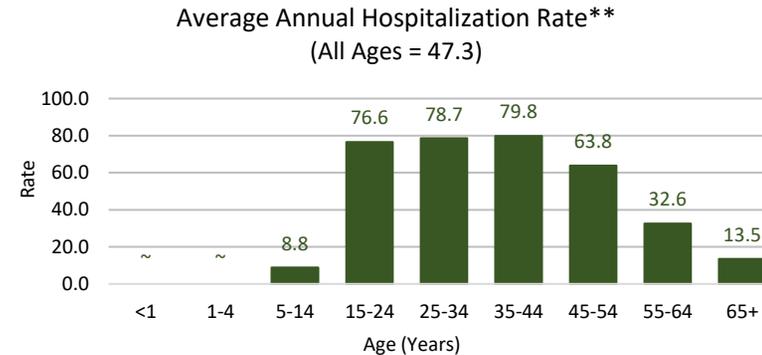
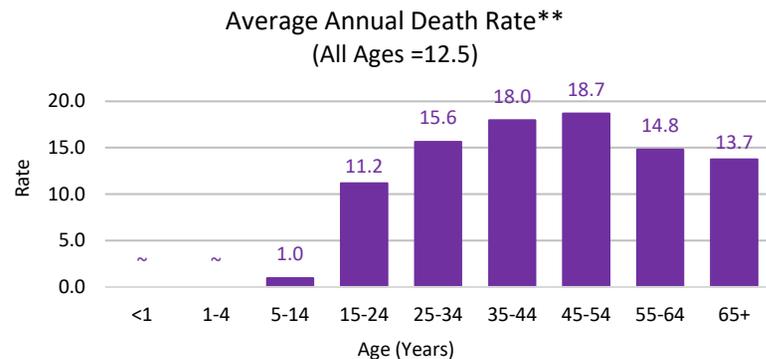
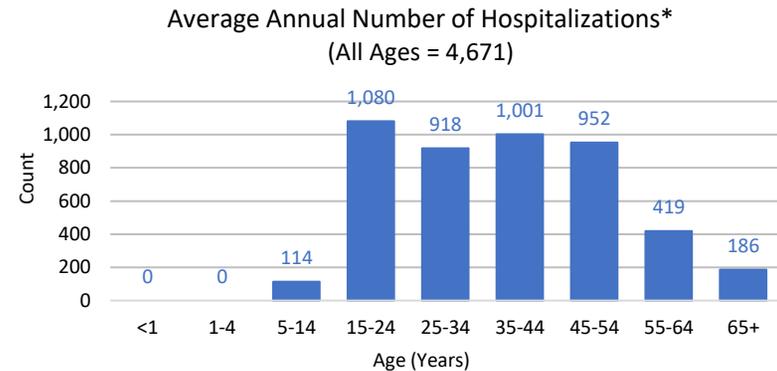
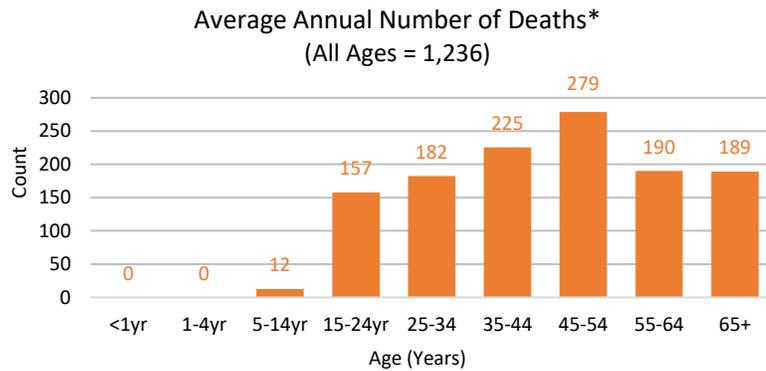
*Cases identified via cause of injury code in the following range: E960-E969 (ICD9CM); T36-T65 with 6th character=3, except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, T49.9, T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, T65.9 (for these, the 5th character=3), T71 with 6th character=3, T74, T76, X92-Y09
**Rate = number of hospitalizations per 100,000 population per year

Suicides

Deaths from Suicide and Hospitalizations from Self-harm Injuries Michigan Residents, 2006-2015

What you should know about suicides: Incidents of suicide steadily increase from the 15 to 24 age range up through the ages of 45 to 54. Incidents average. Incidents and rates for suicide are highest for the 45–54 age category. Hospitalization incidents and rates due

to intentional self-harm are highest for ages 15 to 54. There are approximately four hospitalizations from self-inflicted injuries for each suicide death.



*Cases identified via underlying cause of death (ICD-10-CM codes X60-X84, Y87.0)
 **Rate = number of deaths per 100,000 population per year
 ~Rate could not be calculated

*Cases identified via cause of injury code in the following range: E950-E959 (ICD9CM); T14.91, T36-T65 with 6th character=2, except T36.9, T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, T49.9, T51.9, T52.9, T53.9, T54.9, T56.9, T57.9, T58.0, T58.1, T58.9, T59.9, T60.9, T61.0, T61.1, T61.9, T62.9, T63.9, T64.0, T64.8, T65.9 (for these, the 5th character=2), T71 with 6th character=2, X71-X83 (ICD10CM)
 **Rate = number of hospitalizations per 100,000 population per year
 ~Rate could not be calculated

Poisonings

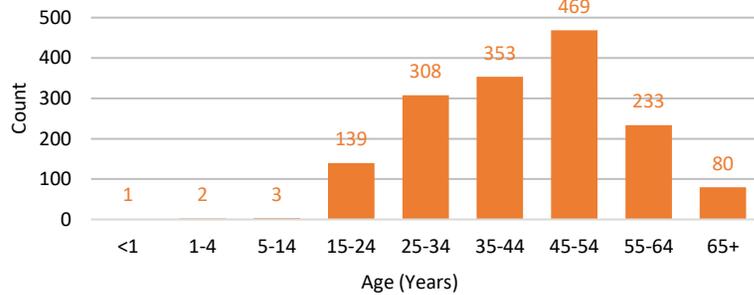
Deaths and Non-Fatal Hospitalizations

Michigan Residents, 2006-2015

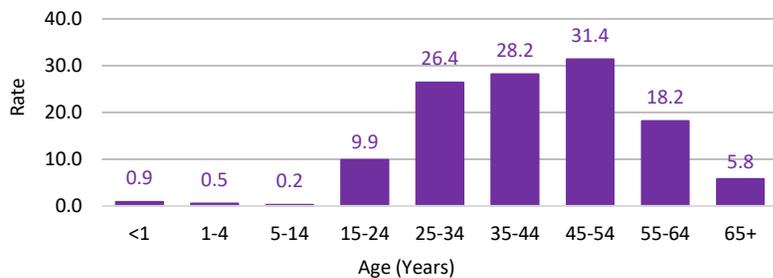
What you should know about poisonings: Over 70 percent of poisoning deaths occur in people between the ages of 25 to 45, but are highest for the 45-54 age group.

Further analysis shows that 90.3 percent of all fatal poisonings were drug-related and include intentional and unintentional poisonings. Hospitalizations due to poisoning were highest in both numbers and rates for people age 15 and over.

Average Annual Number of Deaths*
(All Ages = 1,588)



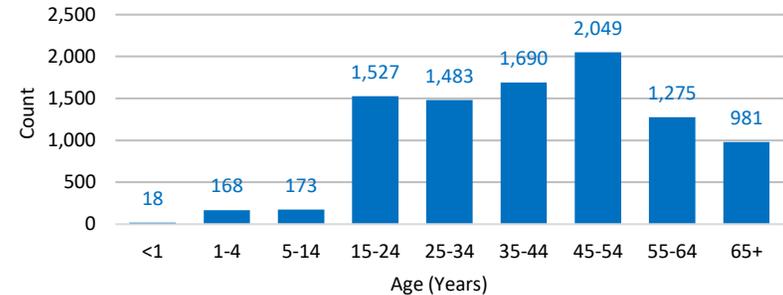
Average Annual Death Rate**
(All Ages = 16.1)



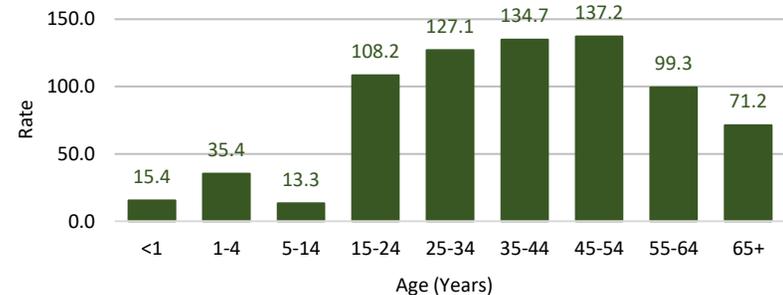
*Cases identified via underlying cause of death (ICD-10-CM codes X40-X49, X60-X69, X85-X90, Y10-Y19, Y35.2)

** Rate = number of deaths per 100,000 population per year

Average Annual Number of Hospitalizations*
(All Ages = 9,365)



Average Annual Hospitalization Rate**
(All Ages = 94.8)



*Cases identified via underlying cause of injury (ICD-9-CM codes E850-E869, E950-E959, E962, E980-E982; ICD-10-CM codes T36-T65 [excluding adverse effects and under-dosing])

**Rate = number of hospitalizations per 100,000 population per year

Recommendations

This report focused on the injury areas that occur most often for Michigan residents. Further evaluation will improve understanding and support the development of strategies to implement effective prevention efforts. This can be accomplished by:

- Applying more scrutiny to find what populations may be over-represented in the injury data. Some data sources allow for further analysis for specific race, ethnicity, age, sex, and geography. Other potential means of analysis should be explored to help develop targeted interventions and focused education strategies.
- Looking at other injury areas (e.g. drownings, burns/fires/hot objects). The areas of focus in this report is not a comprehensive portrayal of all areas, mechanisms or types of injury. Data to support these occurrences exist.
- Diving deeper into detail of injury data to learn more about mechanisms, circumstances to develop more strategic education/intervention strategies. A greater understanding of circumstances and nature of injuries is necessary to improve communication efforts about dangers and risk.
- Working on getting more accurate and reliable data/reporting. Increasing the accuracy of reporting using current systems, improving existing reporting tools, and examining the need for new ones to eliminate data gaps are recommended steps to improve analysis and monitoring.
- Developing partnerships who can help with education and intervention strategies. This could include exploring new and non-traditional ways to make messages more public, and to better target populations who carry the burden of a specific injury area.
- Exploring policies that may lead to safer practices and promote needed protections
- Working to change the idea that injuries are an inevitability that comes with life – promote that they are preventable and very often predictable.
- Update this report at least every five years.

Appendices

Appendix A:
Technical Notes

Average Michigan population for 2010 and 2011 – this was used to calculate rates when 10 years of data were aggregated.

Age Group	Population
<1	114,283
1-4	475,901
5-9	629,201
10-14	670,697
15-24	1,410,624
25-34	1,166,587
35-44	1,254,587
45-54	1,493,415
55-64	1,284,369
65+	1,377,193
Total	9,876,854

Source: Table prepared by the Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services using Population Estimates (latest update 6/2017) released by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. For more information about these estimates produced by the U.S. Census Bureau under a collaborative agreement with NCHS, see [the NCHS bridged-race methodology](#).

Morbidity data

- For multiple-year data, October 2006 through September 2015 was used to abstract injury data with similar injury codes across multiple years. A new coding system was rolled out across the state in October of 2015. Using multiple years of data offered more stability to rate calculations, especially where single-year numbers were small for age groupings. It is important to consider there may be variances by year within this range.

- Prior to Oct. 1, 2015, ICD-9-CM (International Classification of Diseases, Ninth Revision, Clinical Modification) was used to assign morbidity codes¹⁸
 - Because ICD-10-CM injury category definitions had not yet been finalized when this report was started, the Michigan hospitalization data used in this report is drawn from the most recent year of hospital discharge data using ICD-9-CM coding (i.e., FY 2015 – Oct. 1, 2014–Sept. 30, 2015)
 - ICD-10-CM data challenges include
 - Not all injury-related hospitalizations receive an ICD-10-CM code; see coding care rate below.¹⁹
 - Codes may not be consistently/accurately applied in all cases
 - Intent or cause may not be accurately determined/disclosed to allow for accurate recording
 - Overall e-coding rate for FY 2015 Michigan data was 76 percent, meaning cause of injury was not specified for approximately one quarter of the injury-related hospitalizations in Michigan during that fiscal year
 - E-coding rate varies by hospital; reasons for missing e-coding need to be explored

- **Rate that ICD-10-CM codes were applied to hospitalization discharge records by year:**

Year	# E-coded Injury Records	Total Number of Injury Records	% E-coded
2006	47,374	56,859	83.3
2007	48,328	59,247	81.6
2008	49,368	59,440	83.1
2009	48,785	59,440	82.1
2010	49,223	58,771	83.8
2011	48,994	58,725	83.4
2012	44,999	57,948	77.7
2013	41,328	57,300	72.1
2014	37,317	56,587	65.9
2015	44,183	57,945	76.2
Total	459,899	582,262	79.0

¹⁸ For more information about ICD-9-CM and ICD-10-CM, visit the National Center for Health Statistics web portal for Classification of Diseases, Functioning and Disability at www.cdc.gov/nchs/icd/index.htm

¹⁹ Because of the inconsistent use and application of the ICD-10-CM codes for hospitalization discharge data, information gaps were big enough to prevent reliable county-specific reporting.

Additional Data Notes:

- Rates may not be stable for low numbers.
- Ten years of death data (2006-2015) for Michigan residents were aggregated to stabilize rates and numbers to compare to national data. Numbers of injury fatalities for one year (12 months) were not sufficient to rank or calculate rates, particularly for lower age groups.
- Data may not be complete for different injury categories (e.g., child abuse and neglect, intimate partner/sexual violence)
- The intentionality of death or injury is not assigned in all cases.
- Michigan does not have a statewide emergency department data repository
- It is important to note that cause, intent and mechanism may not be accurately captured or recorded through hospital discharge data in this table, particularly for intentional injuries, as these may not be reliably or consistently disclosed or identified.
- ICD-10-CM external cause codes (E-codes) are only applied 79 percent of the time, so nearly 20 percent of injury-related hospitalizations are not captured in this report.

Sources of Injury and Violence Data and Prevention Information

Data sources consulted for this report

- **Child Maltreatment Reports** (U.S. Department of Health and Human Services, Children’s Bureau)
www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment
- **Death certificates**
http://www.michigan.gov/mdhhs/0,5885,7-339-73970_2944_4669_4686---,00.html
- **Hospital discharge data**
<http://www.mdch.state.mi.us/pha/osr/Index.asp?id=14>
- **Michigan Violent Death Reporting System**
http://www.michigan.gov/mdhhs/0,5885,7-339-71548_54879-279986--,00.html
- **Michigan Fatal Injuries** (Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics)
www.michigan.gov/mdhhs/0,5885,7-339-73970_2944_4669_43670---,00.html
- **Michigan Crime Statistics** (Michigan State Police)
www.micrstats.state.mi.us/MICR/Home.aspx
- **Michigan Uniform Crime Reporting** (Michigan State Police)
www.michigan.gov/msp/0,4643,7-123-1586_3501_4621-25744--,00.html
- **Michigan Incident Crime Reporting** (Michigan State Police)
www.micrstats.state.mi.us/MICR/Disclaimer.aspx
- **National Intimate Partner and Sexual Violence Survey 2010-2012 State Report**
www.cdc.gov/violenceprevention/pdf/nisvs-statereportbook.pdf
- **Youth Risk Behavior Surveillance Survey, Centers for Disease Control and Prevention, 2015 Survey for Michigan:**
<https://nccd.cdc.gov/youthonline/App/Results.aspx?TT=G&OUT=0&SID=HS&QID=QQ&LID=MI&YID=2015&LID2=XX&YID2=2015&COL=&ROW1=&ROW2=&HT=QQ&LCT=&FS=S1&FR=R1&FG=G1&FSL=&FRL=&FGL=&PV=&C1=MI2015&C2=XX2015&QP=G&DP=1&VA=CI&CS=N&SYID=&EYID=&SC=DEFAULT&SO=ASC&pf=1&TST=True>

Appendix B:

Additional Sources for Injury and Violence Data and Prevention Information

Michigan Links

- **Building Michigan's Trauma-Informed System for Children and their Families** (Michigan Department of Health and Human Services) https://www.michigan.gov/mdhhs/0,5885,7-339-73971_4911_69588---,00.html
- **Child & Adolescent Health Data Snapshots: Michigan** (Data Resource Center for Child & Adolescent Health) <http://childhealthdata.org/browse/data-snapshots/state-snapshot?geo=24>
- **Child Fatality Annual Reports** (Michigan Department of Health and Human Services, Office of Family Advocate) www.michigan.gov/mdhhs/0,5885,7-339-73970_61179_8366---,00.html
- **Fatality Analysis Reporting System, Michigan and Other States** (National Highway Traffic Safety Administration) www.fars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx
- **Michigan Association for Suicide Prevention** www.masponweb.org
- **Michigan Behavioral Risk Factor Surveillance System** www.michigan.gov/brfs
- **Michigan Child Fatality Registry** (Michigan Department of Health and Human Services Child Protective Services) www.michigan.gov/mdhhs/0,5885,7-339-73971_72316---,00.html
- **Michigan Coordinated Chronic Disease Prevention and Health Promotion Indicators: Hospitalizations for Injuries from Falls** www.michigan.gov/mdhhs/0,5885,7-339-73970_2944_67827-328300--,00.html
- **Michigan Coordinated Chronic Disease Prevention and Health Promotion Indicators: Hospitalizations for Traumatic Brain Injuries** www.michigan.gov/mdhhs/0,5885,7-339-73970_2944_67827-328302--,00.html
- **Michigan Profile for Healthy Youth** www.michigan.gov/miphy
- **Michigan State Police** (Annual Publications of Crime Statistics in Michigan) http://www.michigan.gov/msp/0,4643,7-123-1586_3501_4621---,00.html
- **Michigan Traffic Crash Facts** (Michigan Office of Highway Safety Planning) www.michigantrafficcrashfacts.org/
- **Michigan Youth Risk Behavior Surveillance System** www.michigan.gov/yrbs
- **National Survey of Children's Health, Michigan, 2011-2012** www.childhealthdata.org/browse/survey (select Michigan from drop-down menu)

- **Youth Risk Behavior Survey Results, Michigan, High School, 2015**
<https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=MI>

U.S. Links

- **American Fact Finder** (U.S. Census Bureau)
<https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- **Campus Safety and Security Data Analysis Cutting Tool** (U.S. Department of Education, Office of Postsecondary Education)
<https://ope.ed.gov/campusafety/>
- **Child Abuse and Neglect** (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control)
 - **Prevention:** www.cdc.gov/violenceprevention/childabuseandneglect/index.html
 - **Data:** www.cdc.gov/violenceprevention/childmaltreatment/datasources.html
- **Child Safety and Injury Prevention** (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control)
www.cdc.gov/safechild/
- **Fatality Analysis Reporting System, Michigan and Other States** (National Highway Traffic Safety Administration)
www-fars.nhtsa.dot.gov/Main/index.aspx
- **Healthy People 2020: Injury and Violence Prevention** (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion)
 - **Objectives:** www.healthypeople.gov/2020/topics-objectives/topic/Injury-and-Violence-Prevention/objectives
 - **Data:** www.healthypeople.gov/2020/topics-objectives/topic/injury-and-violence-prevention/national-snapshot
- **Injury Prevention & Control** (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control)
www.cdc.gov/injury/index.html
- **National Intimate Partner and Sexual Violence Survey**
www.cdc.gov/violenceprevention/nisvs/index.html
- **National Sexual Violence Resource Center**
www.nsvrc.org/
- **National Survey of Children’s Health**
www.childhealthdata.org/learn/NSCH
- **TALKING POINTS: The National Intimate Partner and Sexual Violence Survey 2010-2012 State Report – Sexual Violence Data and Prevention Implications**
www.nsvrc.org/publications/nsvrc-publications/talking-points-national-intimate-partner-and-sexual-violence-survey
- **WISQARS (Web-based Injury Statistics Query and Reporting System) database of fatal and nonfatal injury, violent death, and cost of injury** (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control)
www.cdc.gov/injury/wisqars/index.html

Appendix C:

Glossary of Acronyms and Terms Used in This Report

ACE – Adverse Childhood Experiences
CAN – Child Abuse and Neglect
CA/N – Child Abuse and/or Neglect
CDC – Centers for Disease Control and Prevention
Core SVIPP – Core State Violence and Injury Prevention Program
CPS – Child Protective Services
CPST – Certified Child Passenger Safety Technician
E-Codes – External Cause Codes of the International Classification of Diseases (Chapters V-Y for 10th Revision)
HIV – Human Immunodeficiency Virus
IVP – Injury and Violence Prevention
ICD-9-CM – International Classification of Diseases, 9th Revision, Clinical Modification
ICD-10-CM – International Classification of Diseases, 10th Revision, Clinical Modification
IP/SV – Intimate Partner/Sexual Violence
MDHHS – Michigan Department of Health and Human Services
MSP – Michigan State Police
MVC – Motor Vehicle Crash(es)
NCHS – National Center for Health Statistics
NSVIS – National Intimate Partner and Sexual Violence Survey
TBI – Traumatic Brain Injury(s)
YPLL – Years of Potential Life Lost
YRBS – Youth Risk Behavior Survey

The Five Dispositions for CPS investigations follow:

Category V - services not needed. This category is used in cases in which CPS is unable to locate the family, **no** evidence of child abuse and/or neglect (CA/N) is found, or the Family Division of Circuit Court is petitioned to order family cooperation during the investigation but declines, and the family will not cooperate with CPS. Further response by the department is not required.

Category IV - community services recommended. Following a field investigation, the department determines that there is not a preponderance of evidence of CA/N. The department **must** assist the child's family in voluntarily participating in community-based services commensurate with the risk to the child.

Category III - community services needed. The department determines that there is a preponderance of evidence of child abuse or neglect, and the structured decision-making tool (risk assessment) indicates a low or moderate risk of future harm to the child. The department **must** assist the child's family in receiving community-based services commensurate with the risk to the child. The person who harmed the child is not listed on central registry. If the family does not voluntarily participate in the services, or fails to make progress in reducing the risk of further harm to the child, the department may reclassify the case as category II if the child's safety indicates a need for CPS intervention.

Exception: If there is a finding of preponderance of evidence of CA/N and the perpetrator is any of the following, the perpetrator must be identified on central registry, even when the SDM risk for the household is determined to be low or moderate:

- Licensed foster parent.
- Nonparent adult who resides outside the child's home.
- Owner, operator, volunteer or employee of a licensed or registered child care organization.
- Owner, operator, volunteer or employee of a licensed or unlicensed adult foster care family home or adult foster care small group home.

Category II - children's protective services required. The department determines that there is a preponderance of evidence of CA/N, and the structured decision-making tool (risk assessment) indicates a high or intensive risk of future harm to the child. CPS **MUST:**

- Open a protective services case.
- Provide services.
- List the perpetrator of the CA/N on the central registry, either by name or as "unknown," if the perpetrator has not been identified.

Category I - court petition required - CPS determines that there is a preponderance of evidence of CA/N and 1 or more of the following is true:

- A court petition is required by the Child Protection Law.
- The child is not safe and a petition for removal is needed.
- CPS previously classified the case as category II, and the child's family does not voluntarily participate in services and court intervention is needed to ensure the family participates in services to ameliorate issues which place the child at risk of imminent harm.
- There is a violation, involving the child, of a crime listed or described in section 8a(1)(b), (c), (d) or (f) or of child abuse in the first or second degree as prescribed in section 136b of the Michigan Penal Code, 1931 PA 328, MCL 750.136b. (See CPF 718-5, CPS Appendix F- The Michigan Penal Code for a listing of these violations of the penal code.)

In child abuse and neglect cases, perpetrators may be counted in more than one relationship category, as more than one type of relationship may be indicated in incidents involving multiple children.

Domestic Violence - is defined by Michigan State Police as the occurrence of any of the following acts by a person that is not an act of self-defense: causing or attempting to cause physical or mental harm to a family or household member; placing a family or household member in fear of physical or mental harm; causing or attempting to cause a family or household member to engage in involuntary sexual activity by force, threat of force, or duress, and/or engaging in activity toward a family member that would cause a reasonable person to feel terrorized,

frightened, intimidated, harassed, or molested. Domestic Violence incidents are determined solely by the victim to offender relationship and not by the type of crime committed against the victim.

ICD Coding (International Classification of Diseases)

- **The United States uses the International Classification of Diseases, Clinical Modification** to code and classify morbidity data from the inpatient and outpatient records, physician offices, and most National Center for Health Statistics surveys. It is based on the World Health Organization's International Classifications of Diseases.
- **ICD-10-CM (International Classification of Diseases, 10th Revision, Clinical Modification) is the current official system** for assigning morbidity codes to diagnoses and procedures associated with hospital utilization in the United States. ICD-10-CM diagnosis codes are found in chapters A-T and Z of the coding tabular. External cause codes, or E-codes are in chapters V-Y.

Years of Potential Life Lost (YPLL) – is a way to measure the impact of premature mortality on a population. YPLL is the sum of the difference between a predetermined end point and the ages of death for those who dies before that end point. For this report, the age of 80 was used as it was the closest rounded value to the life expectancy at birth for Michigan residents.

<https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson3/index.html>

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Jennifer DeLaCruz, Michigan Department of Health and Human Services

Wendy Eastbrook, Michigan State Police

Deltavier Frye, Michigan Department of Health and Human Services

Carol Genee, Michigan Public Health Institute

Jessica Grzywacz, Michigan Department of Health and Human Services

Alice Hoffman, Michigan Department of Health and Human Services

Tom Largo, Michigan Department of Health and Human Services

Colin Parks, Michigan Department of Health and Human Services

Sarah Rockhill, Michigan Department of Health and Human Services

Laura Rowen, Michigan Department of Health and Human Services

Patricia Smith, Michigan Department of Health and Human Services

Chelsea Walker, Michigan Department of Health and Human Services



Injury & Violence Prevention Section

Division of Chronic Disease and Injury Control
Michigan Department of Health and Human Services
Washington Square Building, 8th Floor
109 W. Michigan Ave.
P.O. Box 30195
Lansing, MI 48909
Ph: 517-335-9518

www.michigan.gov/injuryprevention

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