CHILD DEATHS IN MICHIGAN

Keeping Kids Alive ©

A Report on Case Reviews Conducted from 2015 to 2019

A report on the causes and trends of child deaths in Michigan based on findings from community-based Child Death Review teams with recommendations for policy and practice changes to prevent child deaths.

Published June 2022

Our mission is to understand how and why children die in Michigan, in order to take action to prevent other child deaths.

Prepared By:

The Center for Child and Family Health (CCFH) at the Michigan Public Health Institute (MPHI) on behalf of the Michigan Child Death State Advisory Team

Submitted To:

The Honorable Gretchen Whitmer, Governor, State of Michigan

The Honorable Mike Shirkey, Majority Leader, Michigan State Senate

The Honorable Jason Wentworth, Speaker of the House, Michigan House of Representatives

Dear Elizabeth Hertel, Director,

Michigan Department of Health and Human Services

The Michigan Child Death State Advisory Team is submitting this five-year cumulative report on child deaths in Michigan as required by law (1997 PA 167 MCL 722.627b). On average, more than 1,200 Michigan children died each year from 2015 to 2019.

The Child Death State Advisory Team identified multiple strategies to prevent child deaths, based in part on the information collected through Michigan's local Child Death Review (CDR) teams. The child death review process provides a critical opportunity to identify the causes and circumstances of these children's deaths to prevent future deaths, injuries, and disabilities.

Reducing infant and child mortality will require sustained effort at the state and local levels. Childhood mortality is a crucial indicator of the overall health and welfare of a state, and, therefore, persistent disparities are an indicator of deeper structural inequities. The Child Death State Advisory Team shares your commitment to make Michigan a safer, healthier place to raise a family.

MICHIGAN CHILD DEATH STATE ADVISORY TEAM

MICHIGAN CHILD DEATH STATE ADVISORY TEAM MEMBERSHIP — 2022

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Acknowledgments

This report is written in memory of all of the Michigan children who have died and in honor of the families and communities impacted by the immeasurable loss. The Michigan Child Death State Advisory Team issues this report with the hope that it will encourage additional efforts, both in local communities and among our state leaders, to keep every child in Michigan safe and healthy.

We wish to acknowledge the dedication of the more than 1,400 volunteers from throughout Michigan who serve our state and the children of Michigan by participating in their local Child Death Review (CDR) team. It is an act of courage to acknowledge that the death of a child is a community problem. The willingness of these volunteers to step outside of their traditional professional roles, to examine all of the circumstances that lead to child deaths, and to seriously consider ways to prevent other deaths has made this report possible. Many thanks to the local CDR team coordinators for volunteering their time to organize, facilitate, and report on the findings of their reviews. This report would not be possible without their commitment to the CDR process.

The Michigan Department of Health and Human Services, Office of the State Registrar, Division for Vital Records and Health Statistics has been especially helpful in providing child mortality data and in helping us to better understand and interpret the statistics on child deaths.

The Michigan Department of Health and Human Services, Children's Services Agency provides the funding and oversight for Michigan's CDR Program, which is managed through a contract with the Michigan Public Health Institute.

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Children are not supposed to die. The death of a child is a profound loss, not only to the child's parents, family, and friends, but also to the larger community. To reduce the number of these losses, we must first understand how and why children are dying.

Michigan Child Death Review Program

The Child Death Review (CDR) Program was implemented in Michigan in 1995 to conduct in-depth reviews of child deaths and identify ways to prevent them. In Michigan, there are 76 local CDR teams covering all 83 counties. Some teams serve a two-county or three-county jurisdiction.

CDR is a collaborative process that brings together local professionals from a variety of disciplines who volunteer their time to share and discuss comprehensive information on the circumstances surrounding the deaths of children.

Local CDR team membership is comprised of six mandated members, which include:

The health department

The medical examiner's office

Law enforcement

Michigan Department of Health and Human Services

The prosecutor's office

The court

Local CDR teams may add further membership or invite guests, as necessary, including representatives from emergency medical services, hospitals and other medical facilities, schools, organizations providing mental health and/or substance use services, and organizations serving those impacted by domestic or sexual violence. In total, more than 1,400 professionals volunteered their time to serve on a local CDR team in Michigan.

Each team determines the agency or individual that will coordinate its team activities. The role of the coordinator includes identifying cases for review, identifying and communicating with team members, scheduling and facilitating team meetings, leading prevention discussions, and entering information gathered during the review process into the National Fatality Review-Case Reporting System. One person may perform all of these activities, or the responsibilities may be shared with a co-coordinator. There are no program funds that support the activities of the local CDR team coordinators.

Local CDR teams determine how often they will meet. Meeting frequency varies and is dependent on the number of deaths the team reviews each year. Teams serving rural counties with few deaths may meet once or twice per year, while teams serving mid-sized counties may meet on a quarterly or bimonthly basis. Teams for the most populous counties meet monthly.

Local CDR teams use what they learn during the review process to develop findings and recommendations, which they share with other local entities who can help translate them into prevention initiatives that address needs specific to their communities. It is important to note that CDR is not about assigning blame, determining cause or manner of death, or prosecuting cases, as the teams have no official authority in any of these areas.

The Michigan Child Death State Advisory Team

The Michigan Child Death State Advisory Team was established by Public Act 167 of 1997 (MCL 722.627b) to "identify and make recommendations on policy and statutory changes pertaining to child fatalities and to guide statewide prevention, education and training efforts." The State Advisory Team also provides support to local CDR teams, recommends improvements in protocols and procedures for the Michigan CDR Program, and reviews Michigan's child mortality data as well as local child death review team findings and recommendations to identify causes, risk factors, and trends in child deaths. The Michigan Department of Health and Human Services has administrative responsibility for the State Advisory Team. A list of State Advisory Team members is included earlier in this report on pages 5-8.

The law also requires the State Advisory Team to publish a report on child fatalities. The present report includes information pertaining to the 2,792 children whose deaths were reviewed by Michigan's local CDR teams from 2015 to 2019.

Michigan Public Health Institute Program Support

The Michigan Department of Health and Human Services (MDHHS) established a contract with the Michigan Public Health Institute (MPHI) to manage the CDR Program. The contract requires MPHI to:

- Assist local CDR teams with case identification and provide guidance on team functioning.
- Support the functioning of the Child Death State Advisory Team.
- Provide training, including an annual training for team members, training on other issues pertinent to the investigation and prevention of child fatalities, and training on infant safe sleep for child welfare professionals.
- Develop program support materials, including resource guides for effective reviews, investigative protocols, and the Keeping Kids Alive website (URL: https://bit.ly/3LLG27s).
- Compile information and resources on specific causes of death and promising prevention initiatives.
- Maintain Michigan's CDR Program data, including providing guidance on how to access necessary records, ensuring data is complete and accurate, and analyzing county-specific and cause of death-specific data.
- Represent the Michigan CDR Program at local, state, and national levels.
- Provide other types of technical assistance and support, as needed.

The Michigan CDR Program has established working relationships with numerous diverse organizations throughout the state to promote child health and safety. The program also maintains a productive working relationship with MDHHS that has led to the implementation of innovative strategies to better protect children and prevent deaths.

Child Death Review Data Overview

The information presented in this report is based on data gathered through Michigan's local Child Death Review (CDR) process. The local CDR teams complete a standardized data reporting tool developed by the National Center for Fatality Review and Prevention (NCFRP) and enter data into the web-based National Fatality Review-Case Reporting System (NFR-CRS). This reporting tool was developed with input from many states through their CDR programs. The NCFRP regularly updates the data collection instrument, which can be viewed on the NFR-CRS page of the NCFRP website (URL: https://bit.ly/370ec8M).

Case Selection

Not all child deaths in the state are reviewed. Local CDR teams select cases to review based on the number of deaths that occur, the resources available in the county, and the team's ability to access case information. More populous counties typically limit their reviews to those cases that fall under the jurisdiction of the county medical examiner, which are primarily non-natural deaths. In some instances, typically when the incident or death occurred in a county other than the child's county of residence, a second or third local CDR team may also review the case. When this occurs, only the case data entered into the NFR-CRS by the child's county of residence was included in the analyses depicted in this report. Local CDR teams typically choose to review the deaths of children from birth through age 18.

While the CDR data presented in this report provides rich contextual details about the circumstances surrounding children's deaths, it does not encompass information about every child death in the state. Through examination of the case information on deaths that were reviewed, the resulting data assists in the identification of emerging issues, problematic trends, and key risk factors that can be used to prevent deaths.

Please contact the Michigan CDR Program at the Center for Child and Family Health at MPHI at keepingkidsalive@mphi.org with any questions or additional data requests.

Data Sources

When text in this report refers to "deaths reviewed," data was derived from the information entered into the NFR-CRS and collected through the local CDR team process. Data about deaths reviewed are presented by year of review by the local CDR team, which may not be the same as the year in which the child died.

When text in this report refers to "total deaths," data was derived from official mortality statistics for the state, which are based on death records obtained from the Michigan Department of Health and Human Services, Office of the State Registrar, Division for Vital Records and Health Statistics. Data about total deaths are presented by the year of the child's death.

Data Limitations

As not every child death is reviewed, Michigan's CDR Program dataset is not population-based and should not be directly compared with vital statistics data, nor should it be used to compute mortality rates. It is recommended that complementary data sources are examined alongside the CDR Program data when making prevention, policy, or practice decisions. These complementary data sources may include, but are not limited to, Michigan Vital Records and Health Statistics, emergency department or hospitalization data, Kids Count data, county health rankings data, or data gathered through Michigan's Pregnancy Risk Assessment Monitoring System.

Like most data collection systems, the NFR-CRS has been modified over time to reflect emerging issues such as newer trends in substance use or products that are no longer recommended for infant sleep. To date, there have been multiple major updates to the NFR-CRS. When questions are added or modified, these changes are noted in the NFR-CRS codebook along with the version number in which the change was made. As a result of these changes over time, every data field may not be available for all years during which the NFR-CRS has been in use. In addition, some data elements have been modified to such a degree over the years that they cannot be recoded into a newer version, and this may limit the availability of data from before or after the modification was made.

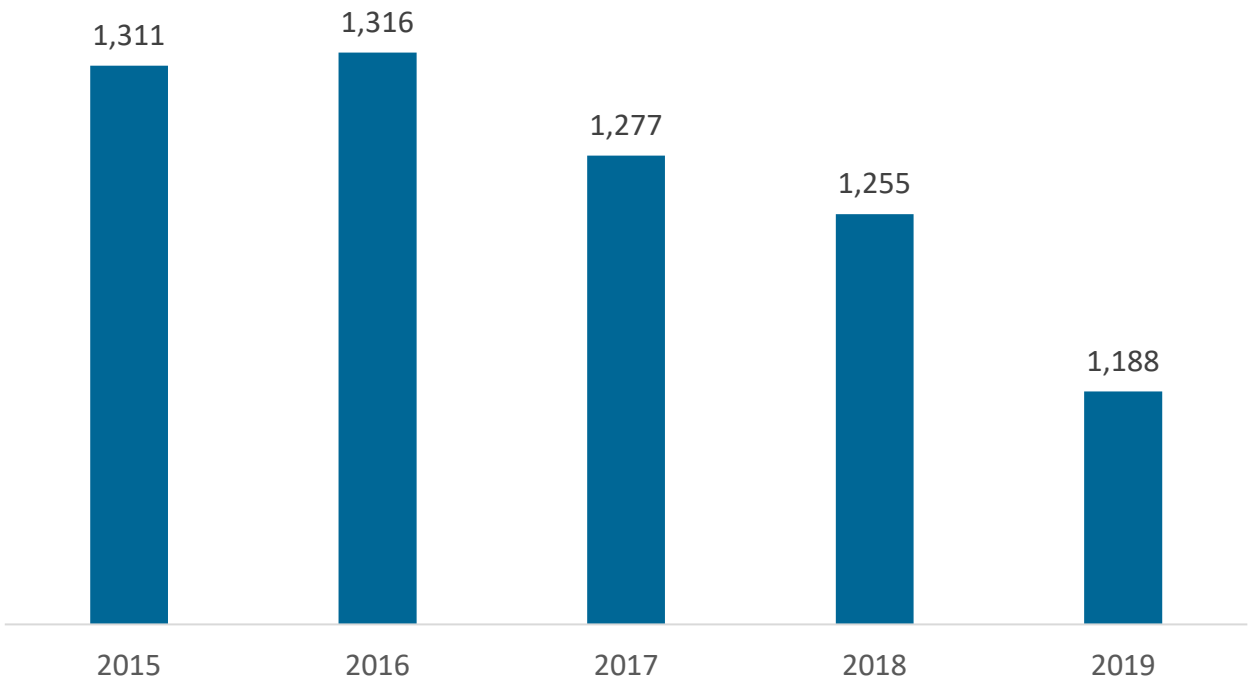
Completeness of the data entered into the NFR-CRS is dependent upon the depth and breadth of information available during the respective case review process. As a result, some variables may be marked missing or unknown for a subset of cases.

Note: *Tables and charts throughout this report may not sum to 100% due to rounding.*

Child Mortality and Deaths Reviewed by Local Child Death Review Teams

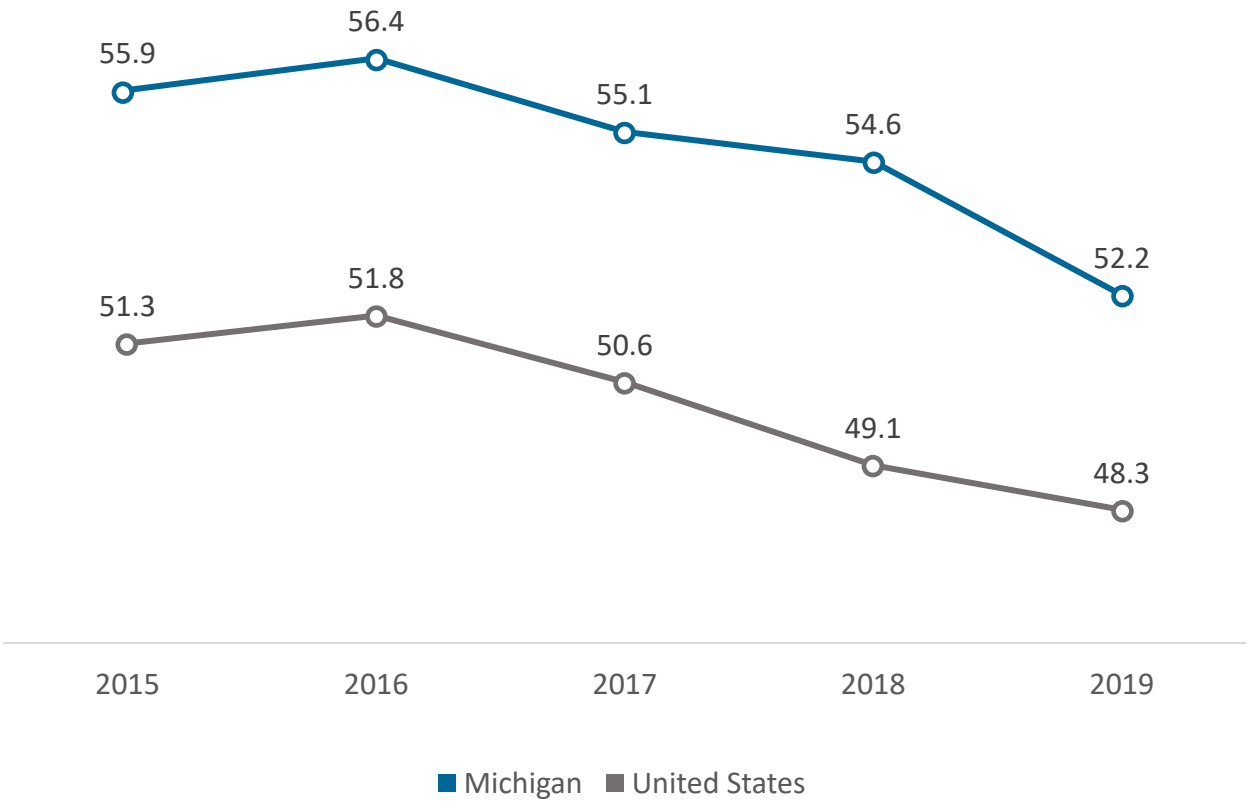
From 2015 to 2019, a total of 6,347 Michigan children from birth through age 18 died.[1] The number of children who died each year trended downward over time, ranging from 1,316 deaths in 2016 to 1,188 deaths in 2019.

Chart 1. Number of Michigan Resident Child Deaths by Year of Death (2015-2019)



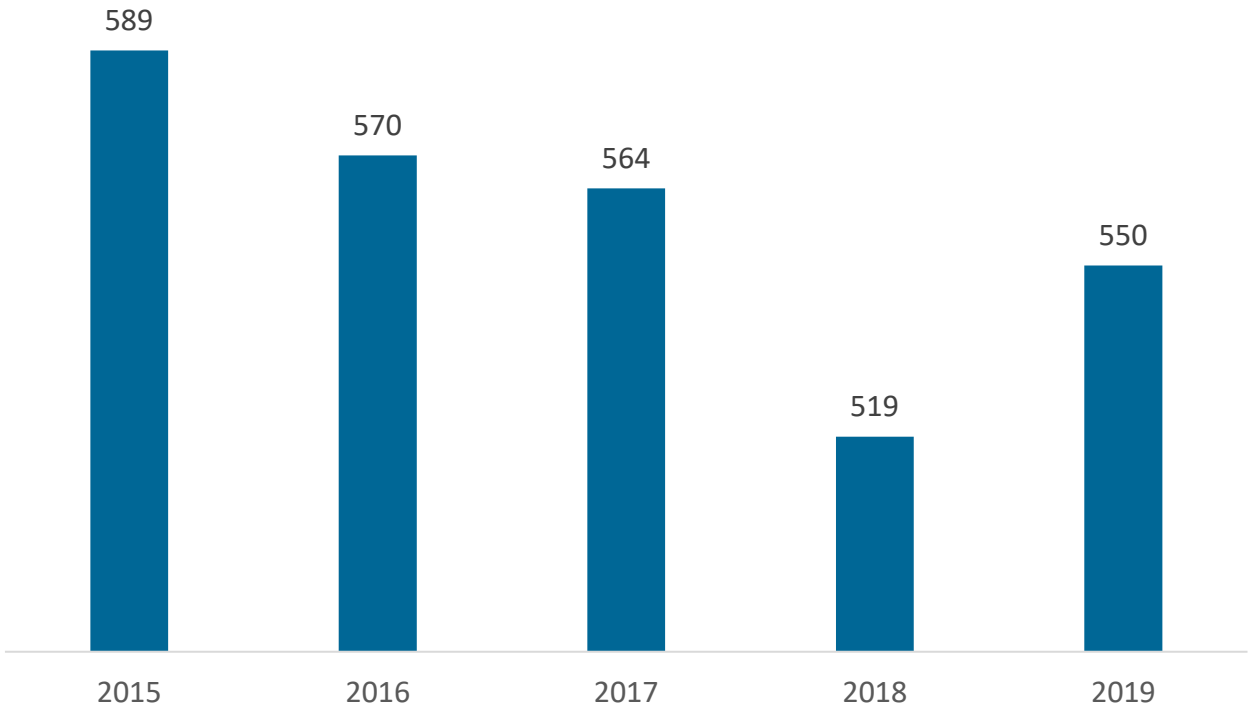
While the rate of child death in both Michigan and the United States has decreased since 2016, Michigan's[1] rate has remained consistently higher than the average rate of child death for the United States.[2]

Chart 2. Rate of Resident Child Deaths per 100,000 Children by Year of Death, Michigan and the United States (2015-2019)



During this same time period, local Child Death Review (CDR) teams reviewed the deaths of 2,792 children. The number of child deaths reviewed varied by year, ranging from 589 in 2015 to 519 in 2018. Please see Appendix A and Appendix B for a complete list of the total number of resident child deaths by county and by the year in which the child died as well as the total number of reviews conducted by county and by the year in which the child's death was reviewed by the local CDR team. As some children's deaths were reviewed by more than one local CDR team, the total of 2,813 reviews conducted from 2015 to 2019 is higher than the total number of child deaths reviewed.

Chart 3. Number of Child Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



From 2015 to 2019, a total of 58 children died while they were placed in foster care. Local CDR teams reviewed 39 of these children's deaths (67%) by the time of this report's publication. To learn more about children's deaths reported to Children's Protective Services, please visit the MDHHS Child Fatality Registry website (URL: https://bit.ly/3jkvL5O).

Manner and Cause of Death

Two types of death determination are reported on death certificates: manner and cause.

Manner refers to the circumstances of the death. There are five possible manners: natural, accident, suicide, homicide, and undetermined, which may also be referred to as indeterminate. The National Association of Medical Examiners[3] provides the following definitions for each of the five manners of death:

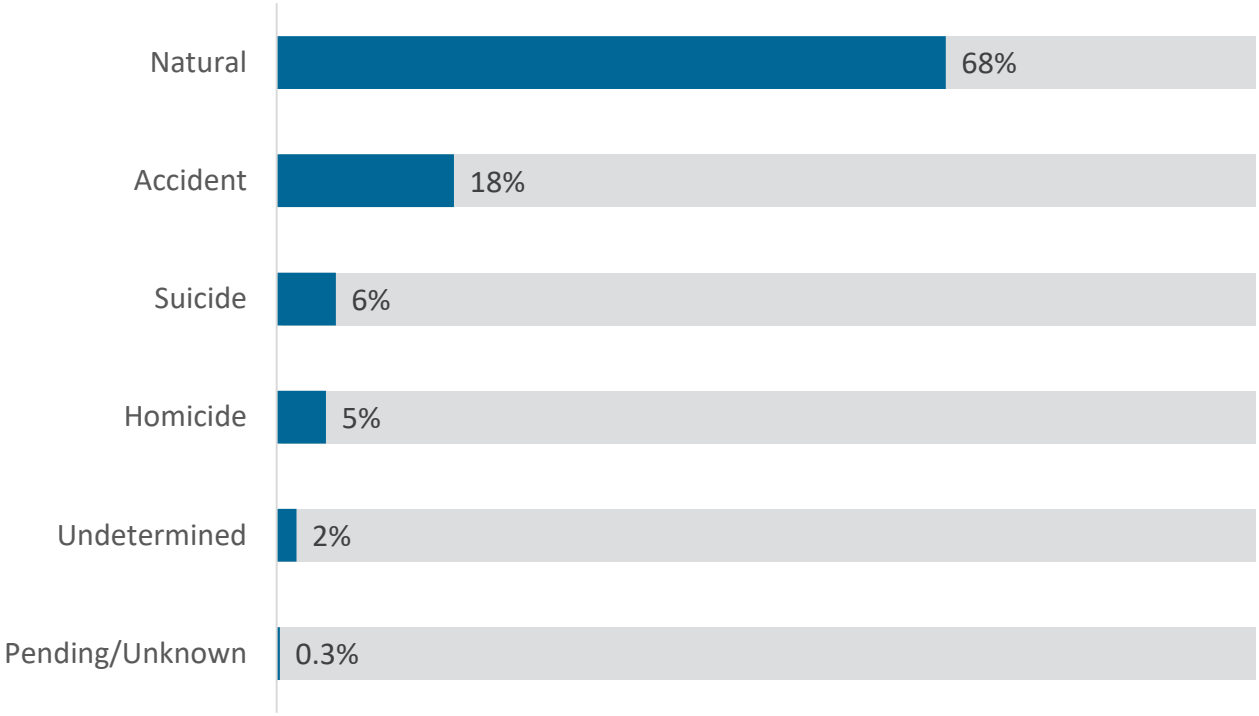
- **Natural:** "Due solely or nearly totally to disease and/or the aging process."
- **Accident:** "An injury or poisoning causes death and there is little or no evidence that the injury or poisoning occurred with intent to harm or cause death. In essence, the fatal outcome was unintentional."
- **Suicide:** "An injury or poisoning as a result of an intentional, self-inflicted act committed to do self harm or cause the death of one's self."
- **Homicide:** "A volitional act committed by another person to cause fear, harm, or death. Intent to cause death is a common element but is not required for classification as homicide. It is to be emphasized that the classification of Homicide for the purposes of death certification is a 'neutral' term and neither indicates nor implies criminal intent, which remains a determination within the province of legal processes."
- **Undetermined:** "The information pointing to one manner of death is no more compelling than one or more other competing manners of death in thorough consideration of all available information."

Cause refers to the actual disease, injury, or complications that directly resulted in the death. Within each of the five manners of death, there can be multiple causes of death. Natural deaths can include causes such as cancer, birth defects, or prematurity. Accidents can include transportation-related fatalities, drownings, suffocations, and fires. Homicides can include causes such as blunt force trauma or multiple gunshot wounds. An undetermined manner of death may include instances where the intent of the decedent or others involved in the death was unknown or it was not clear how the child's underlying medical conditions may have interacted with the external environment.

"Pending/Unknown" in the charts in this report indicates that the official manner of death was not yet available at the time of data entry and/or analysis.

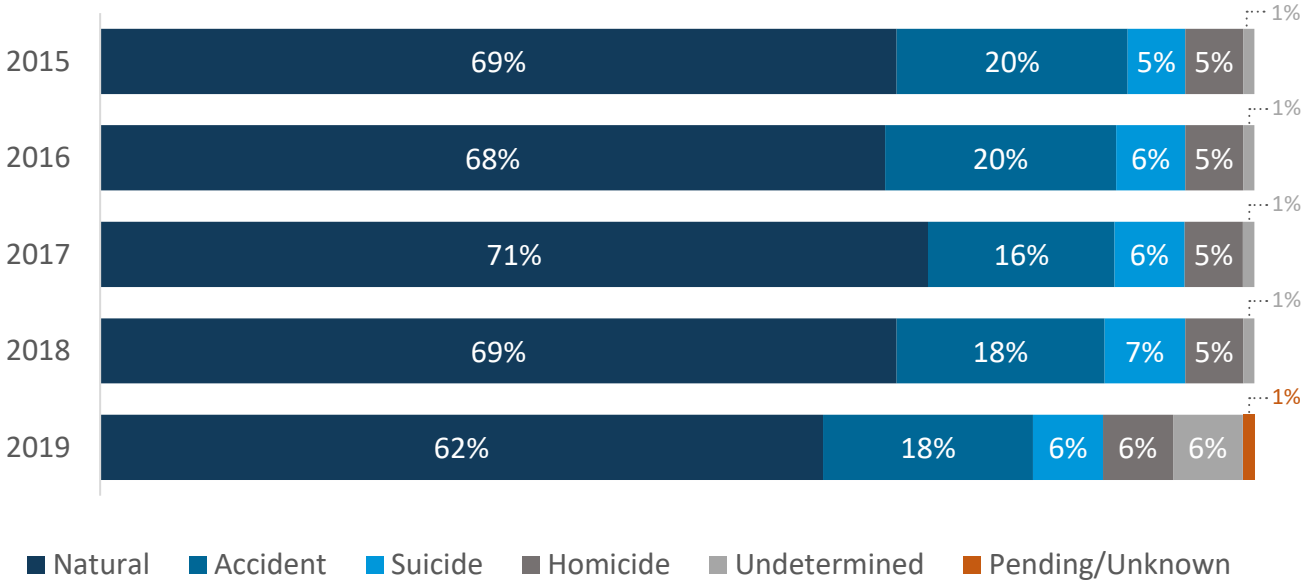
The manner of death determination for the 6,347 Michigan children who died from 2015 to 2019 was most often natural (68%), followed by accident (18%), suicide (6%), homicide (5%), and undetermined (2%). Manner of death was not available at the time of data analysis for 0.3% of the children who died from 2015 to 2019.[1]

Chart 4. Manner of Death Determination for Michigan Resident Children (2015-2019)



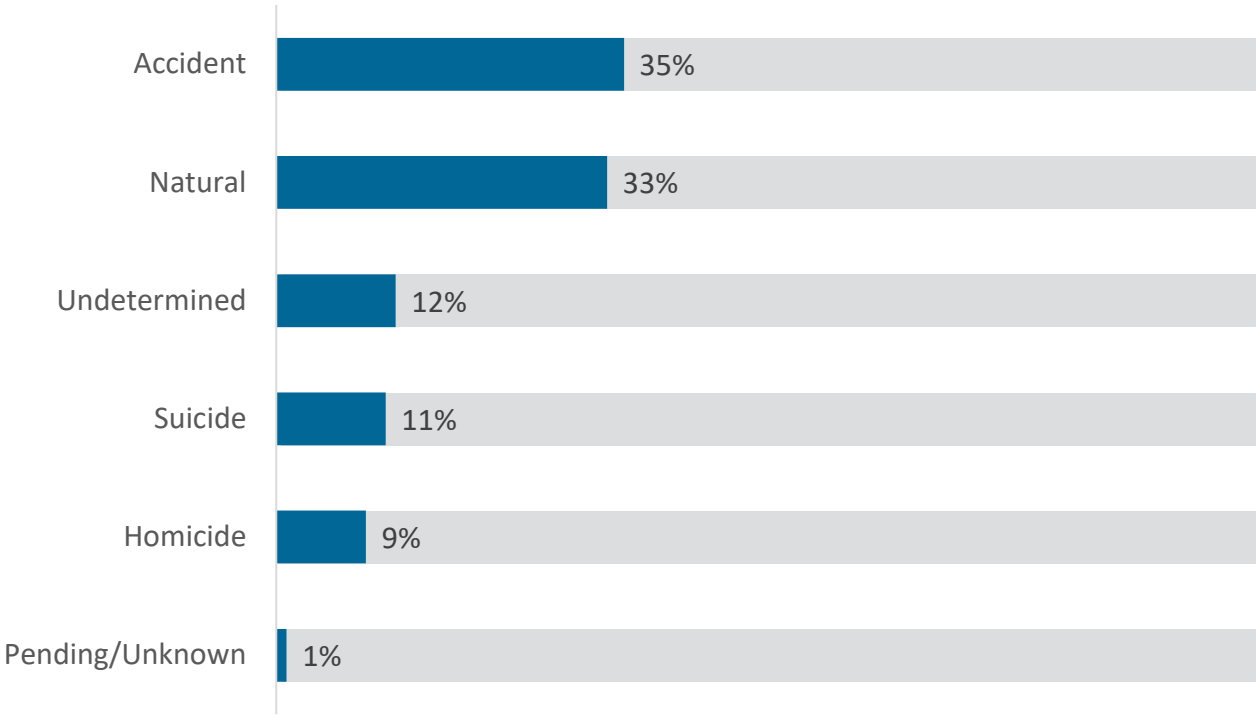
The manner of death determination fluctuated slightly by year. In 2019, the manner of death determination for Michigan resident children was less likely to be natural and more likely to be undetermined than in previous years.[1]

Chart 5. Manner of Death Determination for Michigan Resident Children by Year of Death (2015-2019)



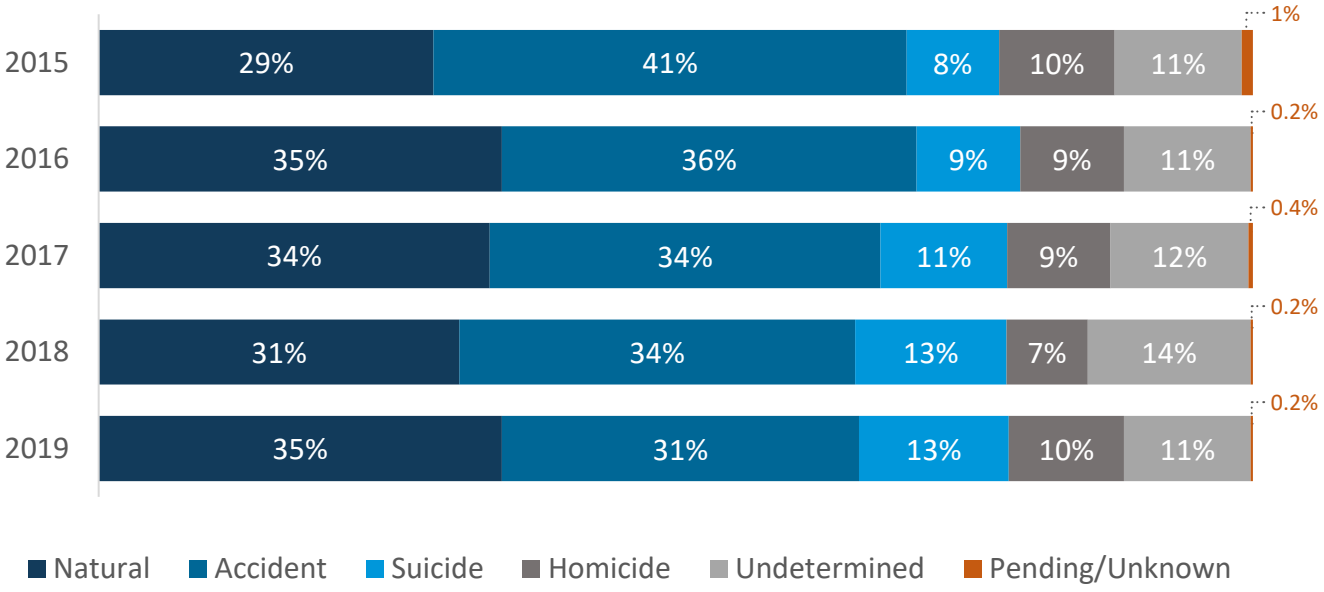
Of the 2,792 deaths reviewed by local CDR teams from 2015 to 2019, the manner of death determination was most often accident (35% of deaths reviewed), followed by natural (33%), undetermined (12%), suicide (11%), and homicide (9%). More populous counties typically limit their reviews to those cases that fall under the jurisdiction of the county medical examiner, which are primarily non-natural deaths. As a result, a relatively lower percentage of the total number of natural deaths was reviewed by local CDR teams.

Chart 6. Manner of Death Determination for Deaths Reviewed by Local CDR Teams (2015-2019)



The manner of death determination for children's deaths reviewed by a local CDR team did change slightly by year of review. Compared to previous years, a greater proportion of deaths reviewed in 2018 and 2019 were due to suicide. Natural deaths accounted for a smaller proportion of the deaths reviewed in 2015 than in subsequent years.

Chart 7. Manner of Death Determination for Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



Child's Demographic Information

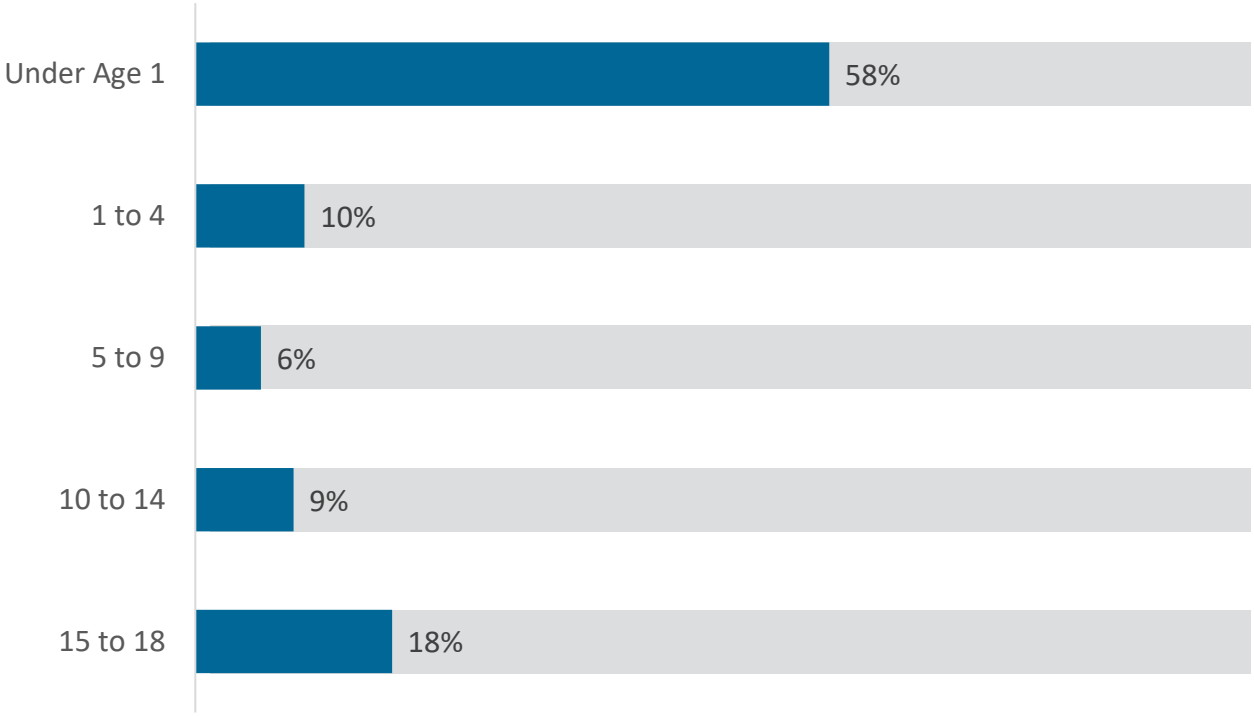
As a result of persistent structural inequities, some children are more likely to die than others. According to the American Medical Association and the Association of American Medical Colleges Center for Health Justice, inequities "are neither natural nor inevitable. Rather, they are produced and sustained by deeply entrenched social systems that intentionally and unintentionally prevent people from reaching their full potential. Inequities cannot be understood or adequately addressed if we focus only on individuals, their behavior or their biology."[4] Inequities result from unfair and unjust circumstances that can be addressed through systemic changes.

The following sections provide details about the age, sex, race, and disability status of the Michigan children who died as well as of those children whose deaths were reviewed by a local CDR team. We hope that highlighting these persistent inequities across all causes of child mortality will encourage local CDR teams and policymakers to work to identify their root causes, including sexism, racism, and ableism, and center equity when planning prevention initiatives. For more information about centering equity in prevention efforts and a tool for identifying and implementing strategies to address inequities, please visit the Children's Safety Network Health Equity Planner (URL: https://bit.ly/3LUFJHt).

Child's Age

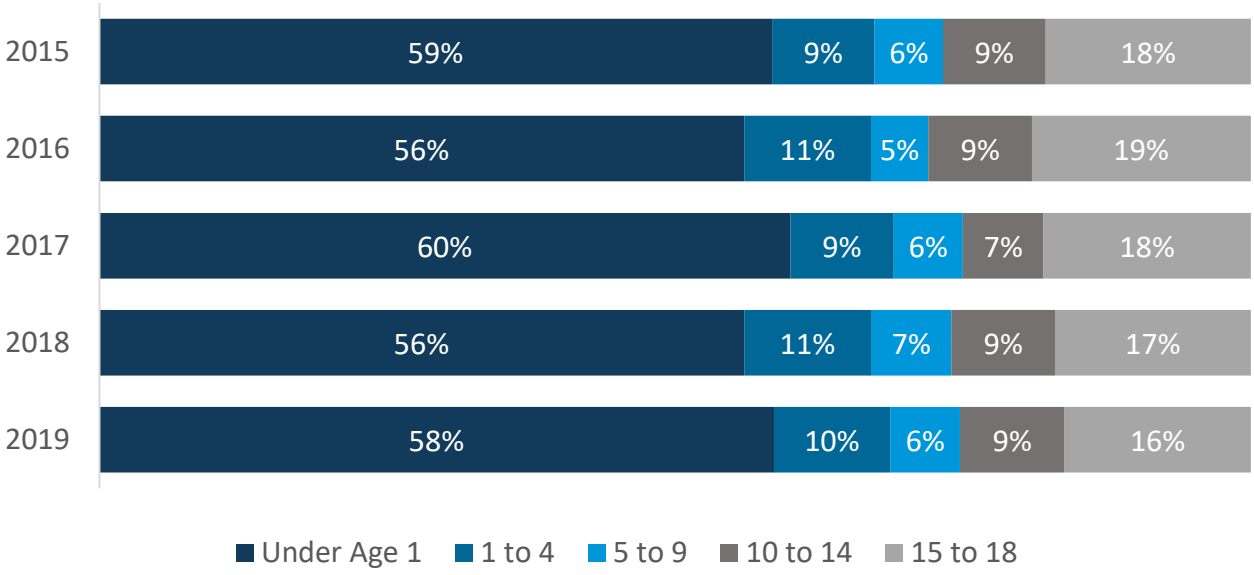
From 2015 to 2019, 58% of the 6,347 Michigan children who died from birth through age 18 were infants (children under the age of 1). Adolescents (children 15 through 18 years old) accounted for an additional 18% of all child deaths, followed by children ages 1 to 4 (10%), children ages 10 to 14 (9%), and children ages 5 to 9 (6%).[1] Infant mortality accounts for the largest proportion of child deaths nationwide[5] and is addressed in further detail on pages 33-36.

Chart 8. Michigan Resident Child Deaths by Child's Age Group (2015-2019)



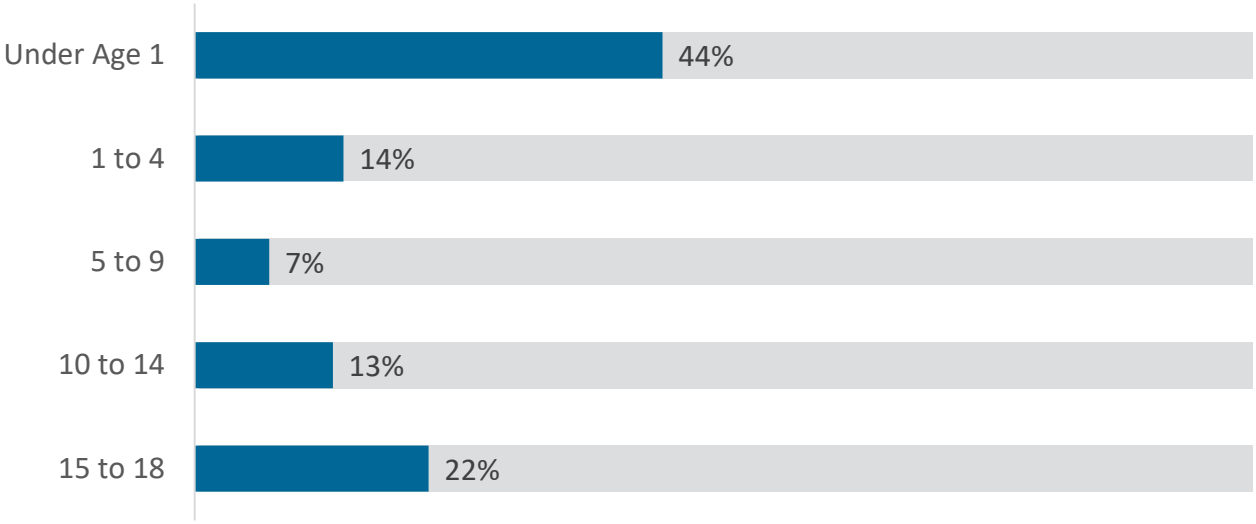
The proportion of the age at which Michigan children died fluctuated slightly by year, but did not change significantly.[1]

Chart 9. Michigan Resident Child Deaths by Child's Age Group and Year of Death (2015-2019)



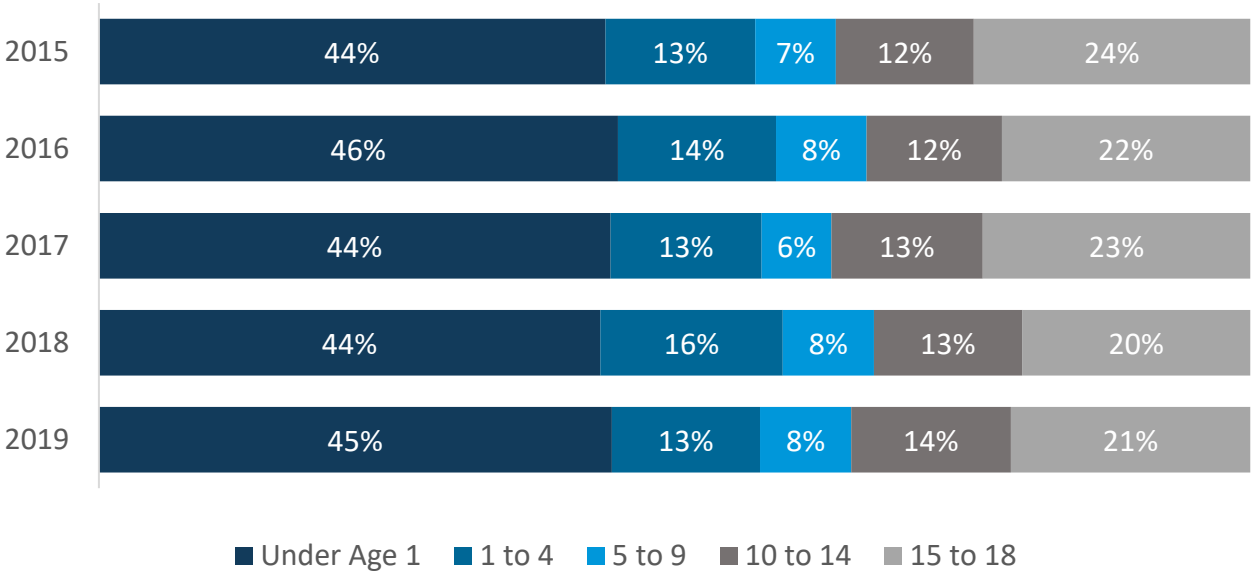
Of the 2,792 deaths reviewed by local CDR teams from 2015 to 2019, most of the children were either infants (44% of deaths reviewed) or adolescents ages 15 through 18 years old (22% of deaths reviewed). Children ages 1 to 4 years old accounted for an additional 14% of the deaths reviewed by local CDR teams, followed by children ages 10 to 14 years old (13% of deaths reviewed) and children ages 5 to 9 years old (7% of deaths reviewed).

Chart 10. Deaths Reviewed by Local CDR Teams by Child's Age Group (2015-2019)



The proportion of the ages of the children whose deaths were reviewed by a local CDR team fluctuated slightly by year, but did not change significantly.

Chart 11. Deaths Reviewed by Local CDR Teams by Child's Age Group and Year of Review (2015-2019)



Child's Age at Death and Manner of Death Determination

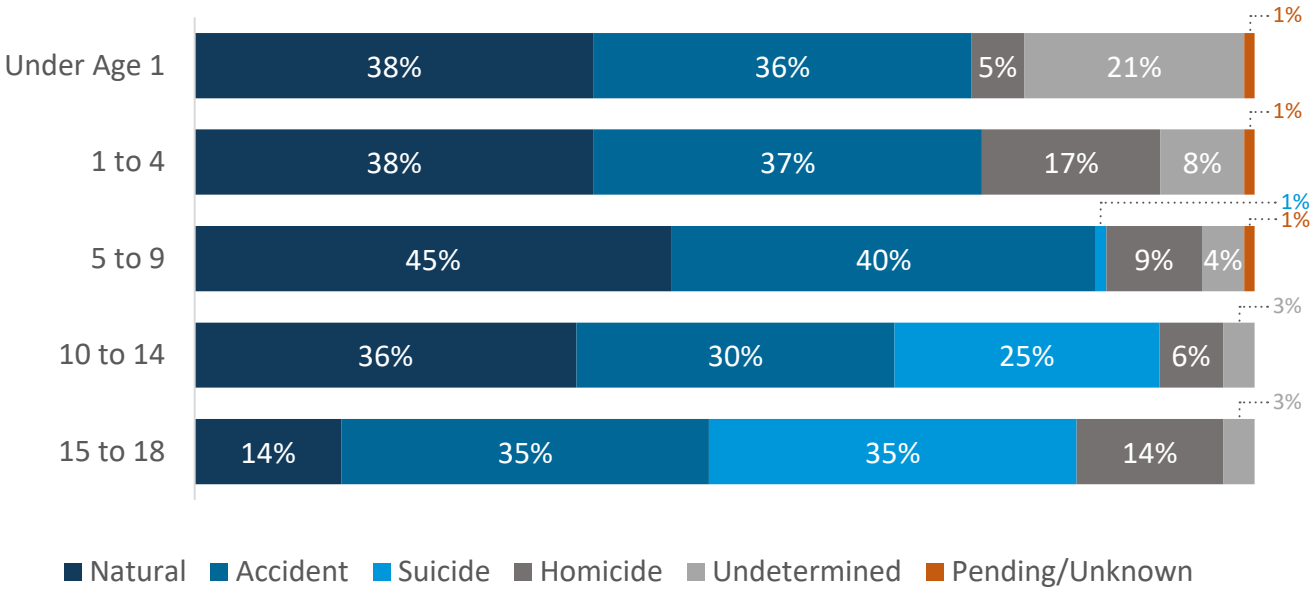
The most common manner of death determination for the 3,672 Michigan infants who died from 2015 to 2019 was natural (84%) followed by accident (12%). The manner of death determination for the 623 children ages 1 to 4 years old and the 380 children ages 5 to 9 years old who died was most likely to be natural (60% and 65%, respectively), followed by accident (26% and 25%, respectively) and homicide (12% and 6%, respectively). For the 550 children ages 10 to 14 years old who died, the manner of death determination was most likely to be natural (53%), followed by accident (23%) and suicide (18%). The manner of death determination for the 1,122 adolescents ages 15 to 18 years old who died was most likely to be accident (33%), followed by suicide (26%), natural (25%), and homicide (13%).[1]

Table 1. Michigan Resident Child Deaths by Manner of Death Determination and Child's Age Group (2015-2019)

Manner of Death	Under Age 1	Ages 1 to 4	Ages 5 to 9	Ages 10 to 14	Ages 15 to 18
Natural	3,100 (84%)	374 (60%)	248 (65%)	292 (53%)	286 (25%)
Accident	424 (12%)	161 (26%)	96 (25%)	126 (23%)	367 (33%)
Suicide	0 (0%)	0 (0%)	3 (1%)	98 (18%)	294 (26%)
Homicide	52 (1%)	72 (12%)	21 (6%)	25 (5%)	146 (13%)
Undetermined	83 (2%)	16 (3%)	12 (3%)	7 (1%)	25 (2%)
Pending/Unknown	13 (0.4%)	0 (0%)	0 (0%)	2 (0.4%)	4 (0.4%)
Total	3,672	623	380	550	1,122

As some CDR teams primarily review deaths that fall under the jurisdiction of the county medical examiner, local CDR teams reviewed a relatively lower percentage of the natural infant deaths that occurred from 2015 to 2019. Of the deaths reviewed by local CDR teams, the manner of death determination was most likely to be natural or accident for all age groups with the exception of adolescents ages 15 to 18 years old. For adolescents ages 15 to 18 years old whose death was reviewed by a local CDR team, the manner of death determination was most likely to be accident or suicide.

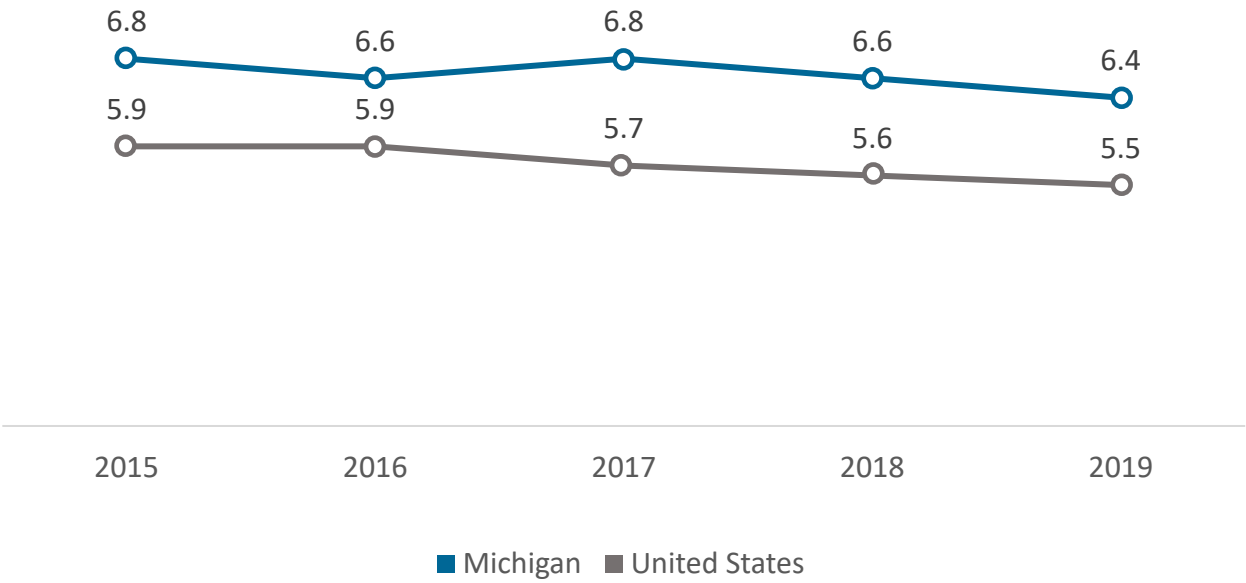
Chart 12. Manner of Death Determination for Deaths Reviewed by Local CDR Teams by Child's Age Group (2015-2019)



Infant Mortality

Infant mortality is defined as the death of a child before their first birthday. According to the Child Trends brief, *Infant, Child, and Teen Mortality*, "in 2017, the death rate for children under age 1 was more than 11 times higher than that for children ages 15 to 19, the age group with the next-highest mortality rate (567 and 51.5 per 100,000, respectively)."[5,a] From 2015 to 2019, the infant mortality rate per 1,000 live births in Michigan remained consistently higher than the corresponding rate of infant mortality in the United States.[6]

Chart 13. Infant Mortality Rate per 1,000 Live Births by Year of Death, Michigan and the United States (2015-2019)



a Child Trends notes that death rates are based on population estimates and differ from infant mortality rates, which are based on live births.

While an average of 6.6 Michigan infants died for every 1,000 live births[6] from 2015 to 2019, some infants were significantly more likely to die before their first birthday. During this time period, Black infants were nearly three times more likely to die than white infants were (an average of 14.2 deaths per 1,000 live births and 4.8 deaths per 1,000 live births, respectively). Native American infants also died at a higher rate than white infants.[7] According to the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, "between 2000-2013, the Native American infant death rate remained on average 11 deaths per 1,000 live births and between 2017-2019, the rate was 11.2 deaths per 1,000 births."

From 2015 to 2019, local CDR teams reviewed the deaths of 1,237 infants. The manner of death determination for these infants was most often natural (38%), followed by accident (36%) and undetermined (21%).

Of the 465 infants whose deaths were reviewed by a local CDR team and were determined to be due to natural causes, 33% were due to prematurity (birth prior to 37 weeks of gestation) and 22% were due to congenital anomalies (birth defects). During this same time period, an average of 33% of all Michigan infant deaths were due to prematurity and related conditions and 18% were due to congenital anomalies.[8]

In Michigan, from 2015 to 2019, accidental suffocation was the leading cause of fatal injury for all children ages 0 to 18 years old, accounting for 21% of all fatal injuries. Infants accounted for 94% of all children's deaths due to accidental suffocation.[1] Of the 443 infants whose deaths were reviewed by a local CDR team and were determined to be due to accidental causes, over 90% were due to asphyxia, suffocation, or strangulation, most commonly in an unsafe sleep environment. Additionally, the largest percentage of deaths ruled undetermined were among infants.

Identification of sleep-related infant deaths requires a multi-pronged approach as the terminology used to classify infant deaths that occur in the sleep environment continues to evolve and remains inconsistent.[9] There has been a diagnostic shift away from the use of the term "Sudden Infant Death Syndrome" (SIDS) when an infant is found unresponsive in a sleep environment. Consistent with national trends, medical examiners in Michigan are more frequently referring to a death under these circumstances as "Sudden Unexpected Infant Death" (SUID) or "Unexplained Sudden Death" with the manner of death classified as undetermined if there is not enough evidence or detailed information regarding the sleep environment to officially classify the manner of death as an accident. Intrinsic[b] and/or extrinsic[c] factors may be identified as potential contributors to the death.[9]

b Intrinsic factors are: natural conditions or risk factors associated with abnormal physiology or anatomy that are concerning as contributors to death but are insufficient as a cause (e.g., low birth weight, preterm birth, small for gestational age, concurrent non-lethal illness, history of febrile seizures), or natural conditions of unknown significance (e.g., cardiac channelopathy or seizure gene variants of unknown significance).

c Extrinsic factors are: conditions in the child's immediate environment that are a potential threat to life but cannot be deemed the cause of death with reasonable certainty (e.g., side or prone sleep if unable to roll to supine, over-bundling without documented hyperthermia, objects in immediate sleep environment, sleep environment not specifically designed for infant sleep, soft or excessive bedding, and sleep surface sharing), injuries or toxicologic findings that are either non-lethal or of unknown lethality, or circumstances/findings otherwise concerning for unnatural death.

To learn more about infant mortality in Michigan, please visit:

- The Data, Reports & Fact Sheets page on the Keeping Kids Alive website for details about sleep-related infant deaths (URL: https://bit.ly/3KGOV1Z)

  The Sudden Unexpected Infant Death (SUID) Case Registry builds on the efforts of local CDR teams to compile information about the circumstances associated with SUID cases as well as information about investigations into these deaths to develop strategies to prevent future fatalities.

- The Michigan Fetal Infant Mortality Review (FIMR) website (URL: https://bit.ly/3E5ntIN)

  FIMR is an evidence-based process, which identifies and analyzes factors contributing to fetal and infant deaths through case reviews and family interviews. FIMR uses a two-tiered system that engages a multi-discipline Case Review Team and a Community Action Team to implement a continuous quality improvement process. There are currently 13 active FIMR teams in Michigan. FIMR's main goals are to:

  - □ Identify social, economic, cultural, safety, health and systems factors that contribute to mortality.
  - □ Craft recommendations to forward to their respective Community Action Teams based on case review findings.

- The Michigan Department of Health and Human Services Maternal Child Health Epidemiology Section website (URL: https://bit.ly/3JAVgdV)

- The Michigan Department of Health and Human Services Division of Maternal and Infant Health website (URL: www.michigan.gov/miheip)

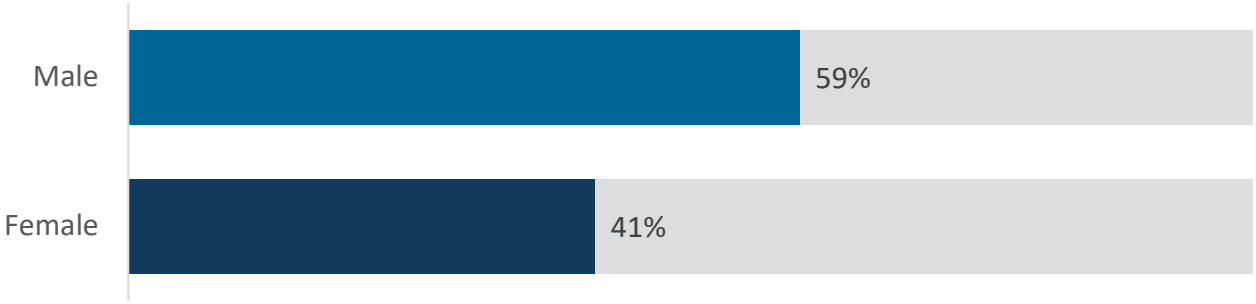
Child's Sex

The nationwide mortality rate for male children is substantially higher than the mortality rate for female children at every age. According to the Child Trends brief, *Infant, Child, and Teen Mortality*, "the largest percentage difference is among teens ages 15 to 19; in this group, males were more than twice as likely to die as their female peers, at 72.7 and 29.4 deaths per 100,000 in 2017, respectively."[5]

The data in this section about the child's sex is reported by the child's sex as recorded on the child's death certificate, which was likely assigned at birth based on a combination of anatomy, hormones, and chromosomes. The child's sex assigned at birth may not be representative of the child's gender identity or gender expression/presentation. According to Trans Student Educational Resources (URL: https://bit.ly/3KElVYz), gender identity is "one's internal sense of being male, female, neither of these, both, or another gender(s)" and gender expression/presentation is "the physical manifestation of one's gender identity through clothing, hairstyle, voice, body shape, etc."

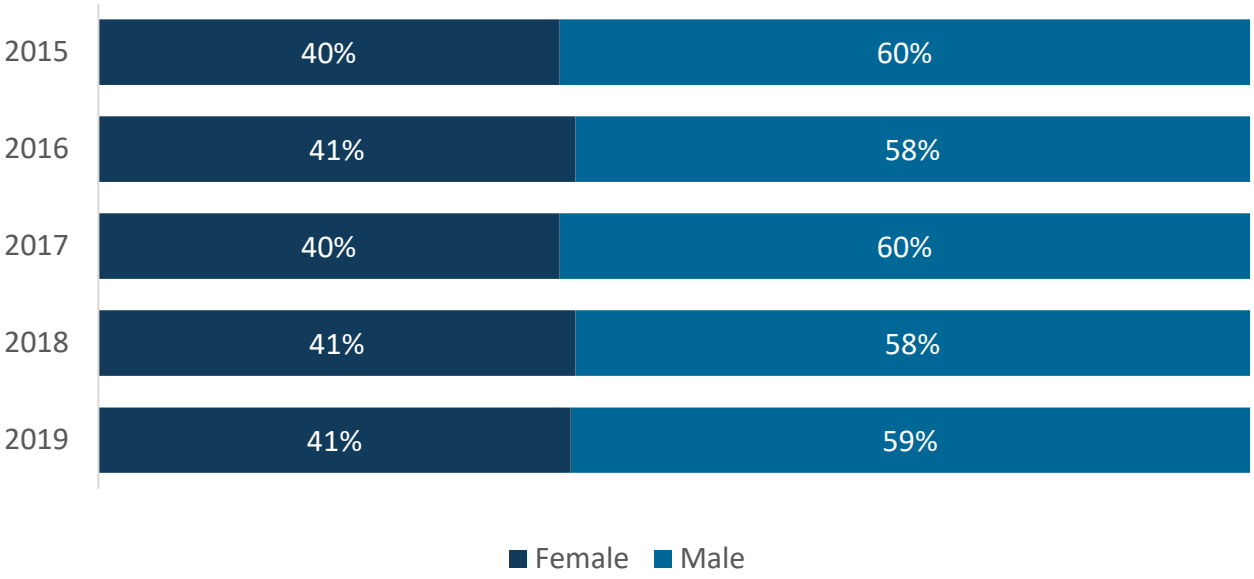
Based on the child's sex as reported on the child's death certificate, males accounted for 59% and females accounted for 41% of all Michigan children ages birth through 18 who died from 2015 to 2019.[1]

Chart 14. Michigan Resident Child Deaths by Child's Sex (2015-2019)



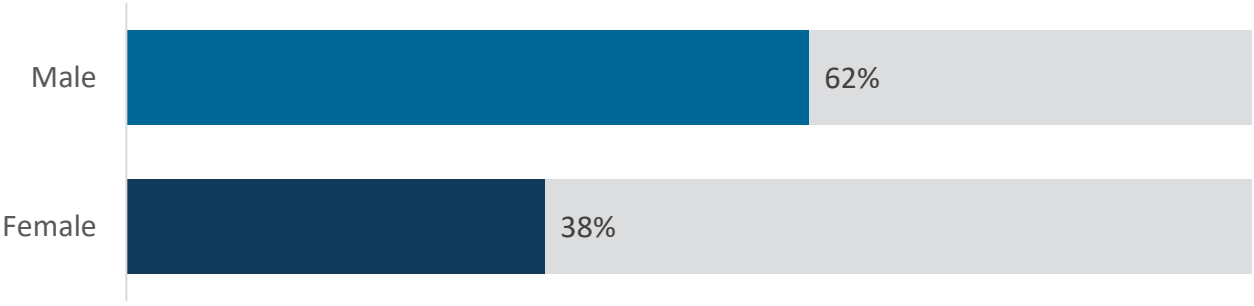
The proportion of male and female Michigan resident children who died each year did not vary significantly.[1]

Chart 15. Michigan Resident Child Deaths by Child's Sex and Year of Death (2015-2019)



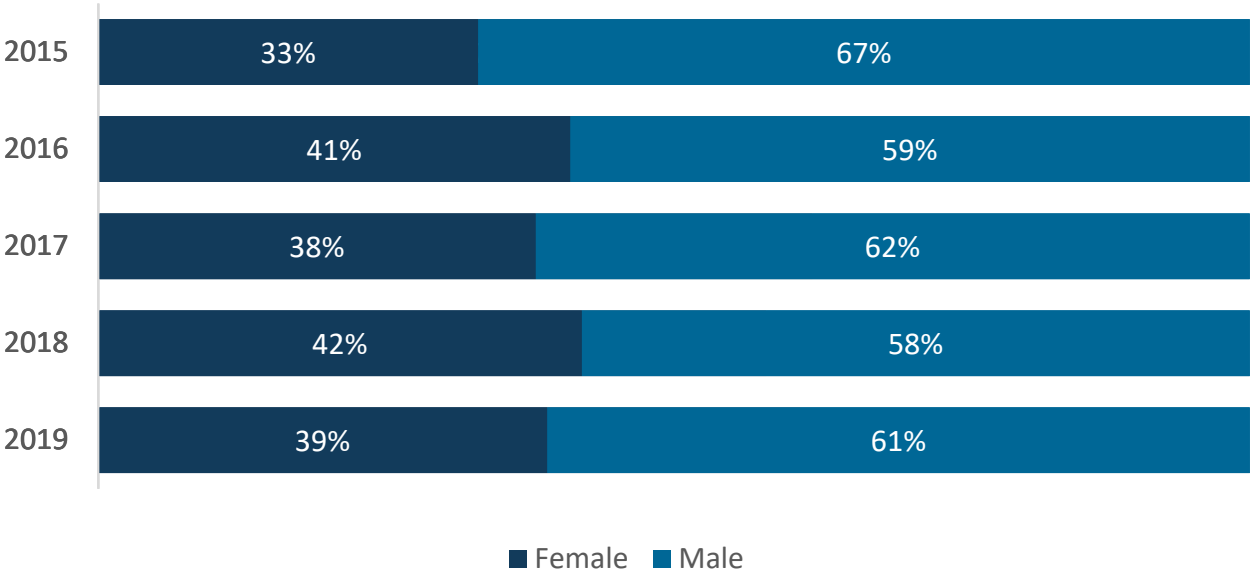
During this same time period, 62% of the children whose deaths were reviewed by local CDR teams were male.

Chart 16. Deaths Reviewed by Local CDR Teams by Child's Sex (2015-2019)



The proportion of male and female children whose deaths were reviewed by a local CDR team did vary by year, ranging from males accounting for 67% of the deaths reviewed in 2015 to 58% of the deaths reviewed in 2018.

Chart 17. Deaths Reviewed by Local CDR Teams by Child's Sex and Year of Review (2015-2019)



Child's Sex and Manner of Death Determination

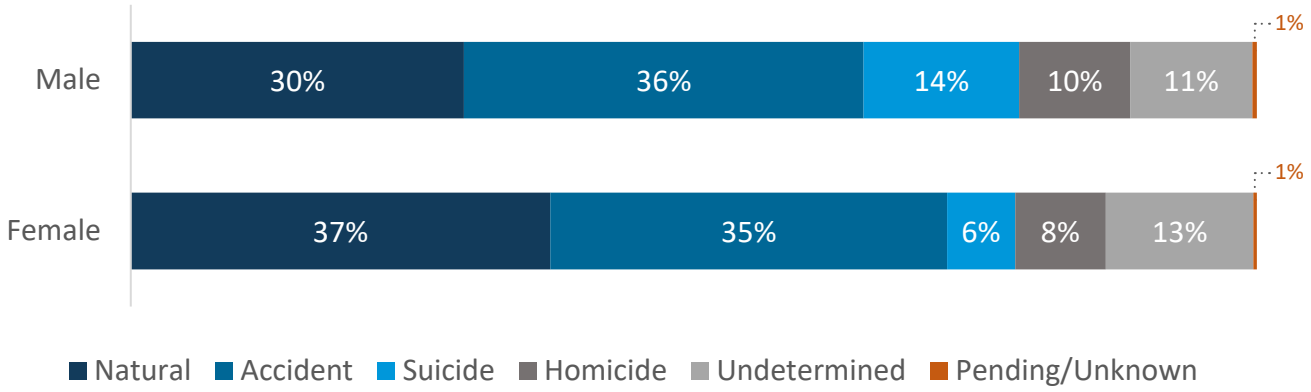
The manner of death determination for the 3,757 male children who died from 2015 to 2019 was most often natural (64%), followed by accident (20%), suicide (8%), and homicide (6%). For the 2,575 female children who died during this same time period, the manner of death determination was most often natural (73%), followed by accident (17%), homicide (4%), and suicide (3%).[1]

Table 2. Michigan Resident Child Deaths by Manner of Death Determination and Child's Sex (2015-2019)

Manner of Death	Male	Female	Unknown Sex
Natural	2,397 (64%)	1,888 (73%)	15 (100%)
Accident	742 (20%)	432 (17%)	0 (0%)
Suicide	306 (8%)	89 (3%)	0 (0%)
Homicide	221 (6%)	95 (4%)	0 (0%)
Undetermined	83 (2%)	60 (2%)	0 (0%)
Pending/Unknown	8 (0.2%)	11 (0.4%)	0 (0%)
Total	3,757	2,575	15

Of the deaths reviewed by local CDR teams from 2015 to 2019, the manner of death determination was most likely to be natural or accident for both male and female children. Suicide accounted for a larger proportion of deaths reviewed by local CDR teams for male children (14%) compared to female children (6%).

Chart 18. Manner of Death Determination for Deaths Reviewed by Local CDR Teams by Child's Sex (2015-2019)

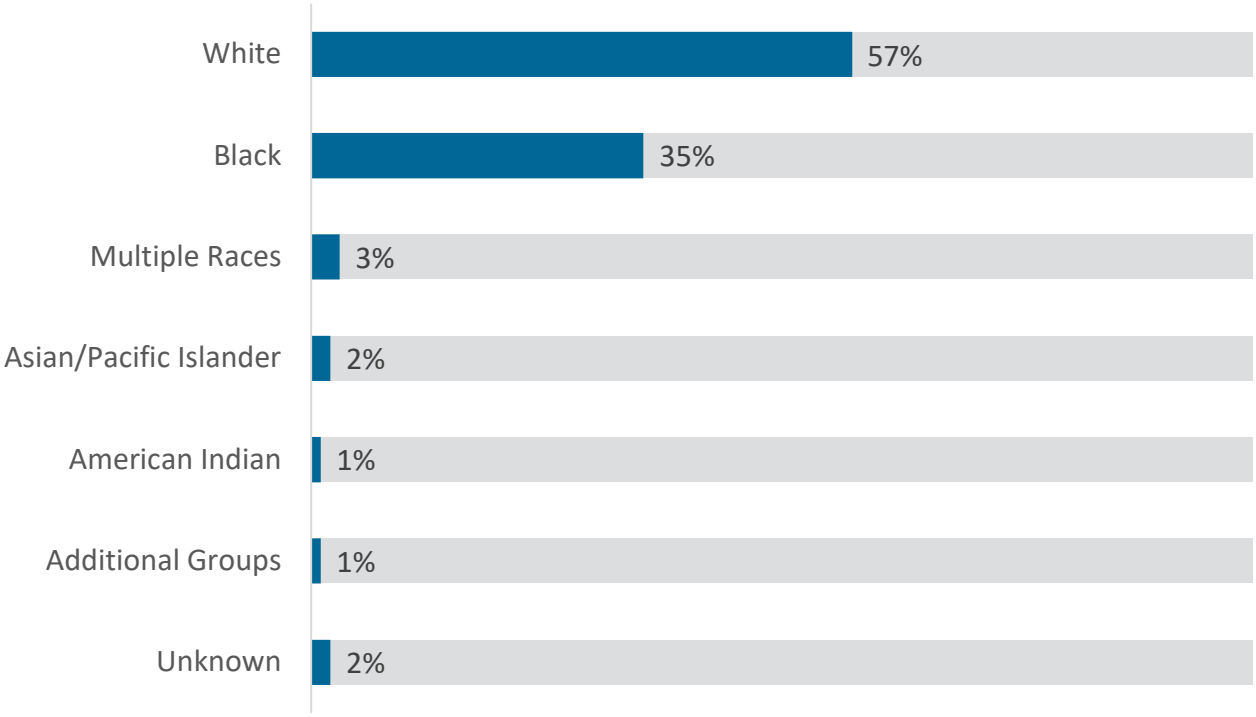


Child's Race

Significant racial disparities exist among child deaths due to inequities rooted in systemic and structural racism, including historical trauma, that unfairly disadvantage some individuals and communities. "Racial differences … reflect effects of racism — that is, the experience of being black in America rather than being black itself — such as toxic stress and its physiological consequences."[10] Although racial identity is unique to every individual, and no single term can encompass the experiences of a diverse group of people, in this report we use the term "Black" to maintain consistency with how race data are recorded in the National Fatality Review-Case Reporting System. In alignment with the language presented in the Urban Institute's brief, *What Happens When People Face Unfair Treatment or Judgment When Applying for Public Assistance or Social Services?*, we have also "capitalized Black to denote the unique Black experience as one characteristic of a diverse group of people, ethnicities, and cultures … (and) have not capitalized white, a term and label for a range of historically grouped ethnicities used to delineate a contrast with people of color."[11]

From 2015 to 2019, Michigan resident children who died were most likely to be white (57%). Black children accounted for 35% of all child deaths and an additional 3% of the children who died were of multiple races, 2% were Asian or Pacific Islander, 1% were American Indian, and 1% were children from additional groups.[1]

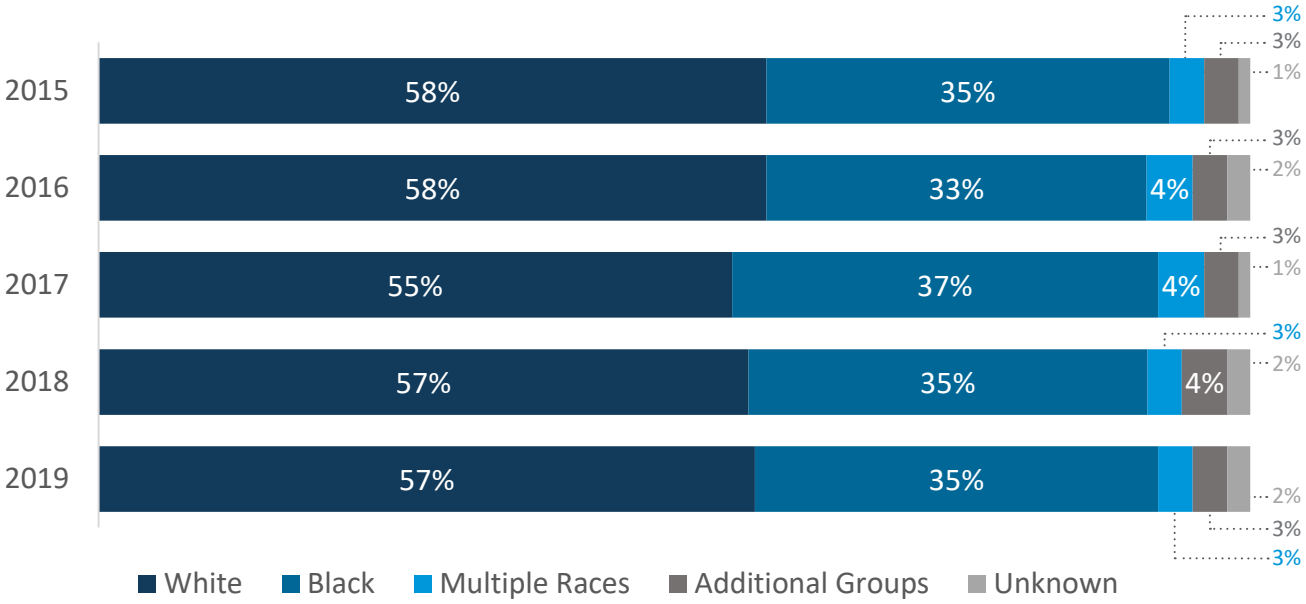
Chart 19. Michigan Resident Child Deaths by Child's Race (2015-2019)



Note: *Additional groups include children of all other races.*

The proportion of the race of the Michigan children who died fluctuated slightly by year but did not change significantly.[1]

Chart 20. Michigan Resident Child Deaths by Child's Race and Year of Death (2015-2019)



Note: *Additional groups includes American Indian children and Asian or Pacific Islander children as well as children of all other races.*

Black children were significantly more likely to die compared to children of other races. Nationwide, Black children had the highest rate of death among children ages 1 to 19.[5] While 19% of the population of Michigan children was Black, 37% of the children who died were Black. From 2015 to 2019, the rate of death among Black children was 2.5 times greater than the rate of death among white children.[1,12]

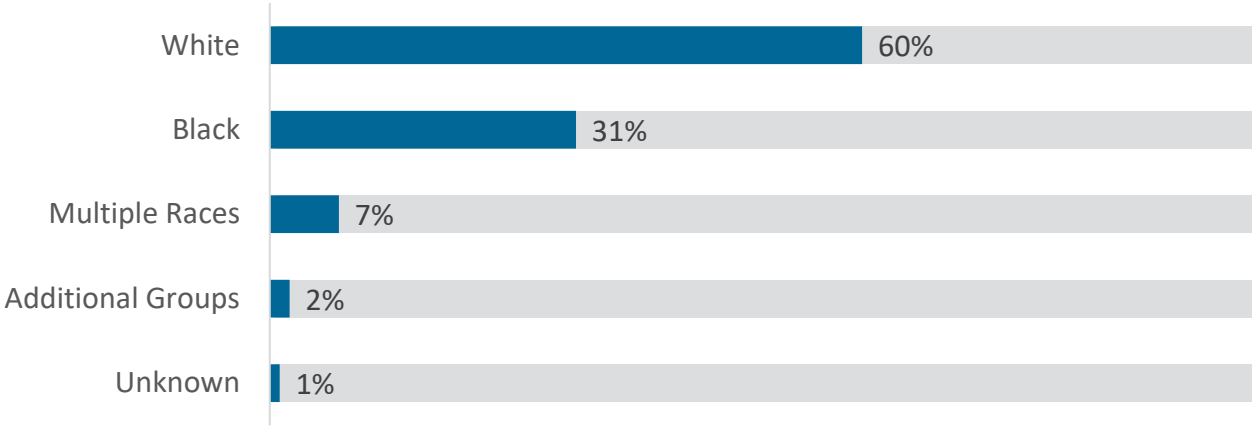
Table 3. Rate of Death for Michigan Resident Children by Child's Bridged Race (2015-2019)

Child's Bridged Race	Average Number of Deaths per Year	Average Total Child Population	Rate of Death per 100,000 Children
White	739	1,763,094	41.9
Black	461	433,958	106.1
Asian or Pacific Islander	28	91,081	30.7
American Indian	12	26,425	45.4

Note: *The race of the child is provided by bridged race for the total child population. The bridged race assigned to each child who died is depicted in Table 3 to allow for a comparison between population estimates and mortality data. As a result, the number of deaths reported for each bridged race in Table 3 will not align with and should not be compared to any other tables or charts in this report that present the child's race. More information about race bridging is provided by the Centers for Disease Control and Prevention, National Center for Health Statistics (URL: https://bit.ly/37ud2m6).*

During this same time period, 60% of the children whose deaths were reviewed by local CDR teams were white and 31% were Black. An additional 7% of the children whose deaths were reviewed by local CDR teams were of multiple races and 2% were children from additional groups, including children who were American Indian and Asian or Pacific Islander.

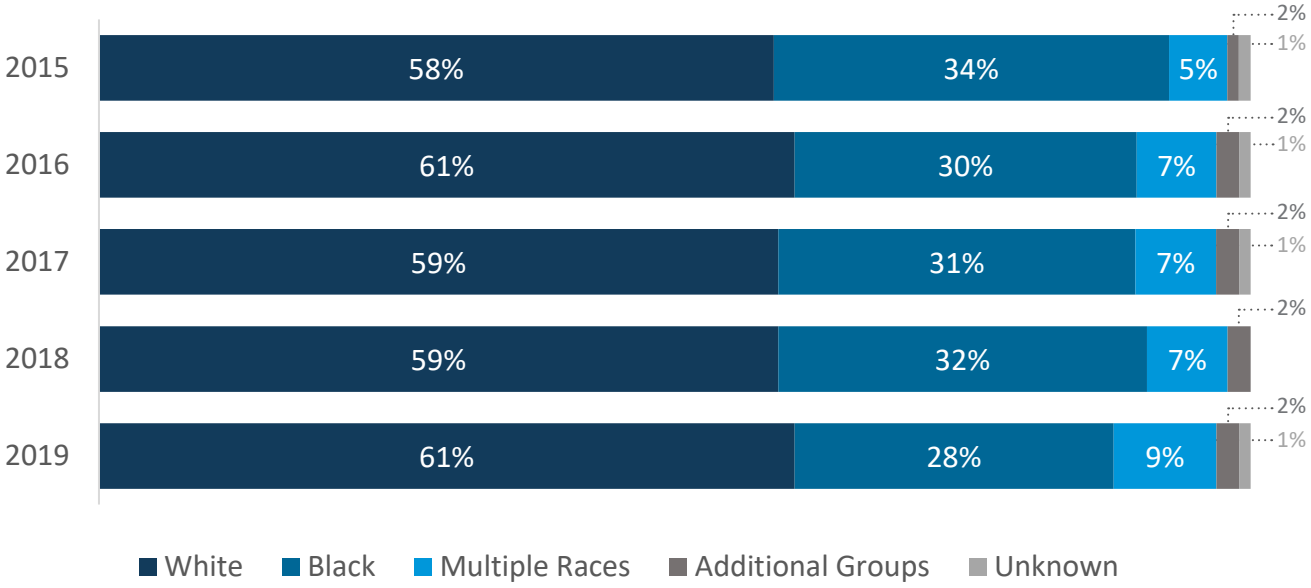
Chart 21. Deaths Reviewed by Local CDR Teams by Child's Race (2015-2019)



Note: *Additional groups includes American Indian children and Asian or Pacific Islander children.*

The proportion of the race of the children whose deaths were reviewed by local CDR teams did fluctuate slightly by year from 2015 to 2019. Black children made up a higher proportion of all deaths reviewed in 2015 (34% of deaths reviewed) compared to 2019 (28% of deaths reviewed).

Chart 22. Deaths Reviewed by Local CDR Teams by Child's Race and by Year of Review (2015-2019)



Note: *Additional groups includes American Indian children and Asian or Pacific Islander children.*

Child's Race and Manner of Death Determination

The manner of death determination for the 3,600 white children who died from 2015 to 2019 was most likely to be natural (67%), followed by accident (19%) and suicide (9%). For the 2,209 Black children who died during this same time period, the manner of death determination was most often natural (68%), followed by accident (18%) and homicide (9%). The manner of death determination for the 219 children of multiple races and the 212 children from additional groups, including American Indian and Asian or Pacific Islander children, was most often natural (68% and 77%, respectively) followed by accident (17% and 13%, respectively).[1]

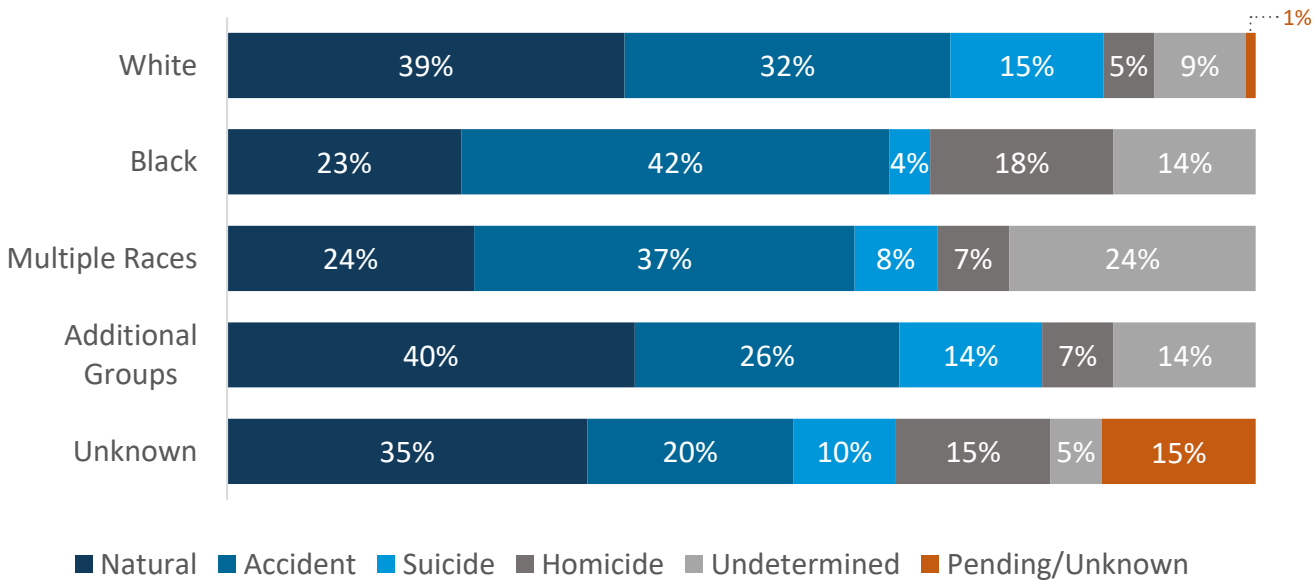
Table 4. Michigan Resident Child Deaths by Manner of Death Determination and Child's Race (2015-2019)

Manner of Death	White	Black	Multiple Races	Additional Groups	Unknown Race
Natural	2,402 (67%)	1,506 (68%)	148 (68%)	163 (77%)	81 (76%)
Accident	697 (19%)	397 (18%)	38 (17%)	28 (13%)	14 (13%)
Suicide	326 (9%)	39 (2%)	12 (5%)	15 (7%)	3 (3%)
Homicide	85 (2%)	206 (9%)	14 (6%)	5 (2%)	6 (6%)
Undetermined	74 (2%)	58 (3%)	7 (3%)	1 (0.5%)	3 (3%)
Pending/Unknown	16 (0.4%)	3 (0.1%)	0 (0%)	0 (0%)	0 (0%)
Total	3,600	2,209	219	212	107

Note: *Additional groups includes American Indian children and Asian or Pacific Islander children.*

Of the children whose deaths were reviewed by a local CDR team from 2015 to 2019, the manner of death determination for white children and children from additional groups, including children who were American Indian and Asian or Pacific Islander, was most often natural (39% and 40% of deaths reviewed, respectively) followed by accident (32% and 26% of deaths reviewed, respectively). During this same time period, the manner of death determination for Black children whose deaths were reviewed by a local CDR team was most often accident (42%), followed by natural (23%) and homicide (18%). The manner of death determination for children of multiple races whose deaths were reviewed by a local CDR team was most often accident (37%), followed by natural (24%) and undetermined (24%).

Chart 23. Manner of Death Determination for Deaths Reviewed by Local CDR Teams by Child's Race (2015-2019)



Note: *Additional groups includes American Indian children and Asian or Pacific Islander children.*

Child's Disability Status or Presence of Chronic Illness

Historically, the fields of medicine and public health have viewed disability as "a defect within the individual," which must be "cured, fixed, or completely eliminated."[13] Since the 1960s, the social model of disability has been gaining traction, particularly within the disability community. The social model states that "environmental factors - physical barriers, negative societal attitudes, and inadequate public policies - that fail to accommodate difference cause disability."[14]

As a result of these barriers, people with disabilities can experience discrimination that may be compounded by persistent isolation, unequal access to care, and a systematic "disregard for the health disparities experienced by some groups as a natural consequence of being in the group," such as the pervasive myth that disability automatically equates to poor health "rather than an inequity that needs to be addressed through multiple approaches."[14] We hope that by naming ableism as a contributing factor to child mortality, we can emphasize the need to value the full spectrum of abilities, include people with disabilities in the design and implementation of prevention initiatives, and create accessible prevention programming.

According to findings from the 2019 American Community Survey, over three million children under the age of 18 in the United States had a disability. Of the children living in the United States and Michigan, 4.3% and 4.5%, respectively, reported having any type of disability.[15]

The American Community Survey defines disability as "various physical, mental, or emotional conditions that pose limitations to certain activities or tasks" and includes the following six types of disabilities.[d]

- **Vision difficulty:** Blindness or serious difficulty seeing, even when wearing glasses.
- **Hearing difficulty:** Deafness or serious difficulty hearing.
- **Cognitive difficulty (aged 5 and older):** Serious difficulty concentrating, remembering, or making decisions because of a physical, mental, or emotional condition.
- **Ambulatory difficulty (aged 5 and older):** Serious difficulty walking or climbing stairs.
- **Self-care difficulty (aged 5 and older):** Difficulty dressing or bathing.
- **Independent living difficulty (aged 15 and older):** Difficulty doing errands alone, such as visiting a doctor's office or shopping.[15]

d The American Community Survey uses the term "difficulty" to describe each type of disability.

For children ages 4 and younger, 0.7% and 0.5% of children in the United States[16] and Michigan,[17] respectively, were reported to have a vision or hearing difficulty through the 2018 American Community Survey. Vision and hearing difficulties were the only two areas assessed through the American Community Survey for this age group. In 2018, the prevalence of disability for children ages 5 to 15 years old was 5.4% in the United States[16] and 6.6% in Michigan.[17] For children ages 5 to 17 years old living in the United States and in Michigan, the most commonly reported disability type in 2018 was cognitive difficulty (4.3%[16] and 5.4%,[17] respectively).

Nationwide, some children were more likely to report having a disability than others, including American Indian and Alaska Native children (5.9%), children of multiple races (5.2%), and Black children (5.1%).[15] While children with disabilities were more likely to live in poverty,[15] some reports find that an increasing number of children from advantaged backgrounds may be diagnosed with neurodevelopmental and mental health conditions due to these families having "greater resources for seeking diagnoses and services for their children."[14]

Disability or chronic illness is defined in the National Fatality Review-Case Reporting System (NFR-CRS) more broadly than the definition of disability utilized by the American Community Survey and may include the following types of disabilities or chronic illnesses:

Physical or orthopedic conditions

Mental health or substance use disorders

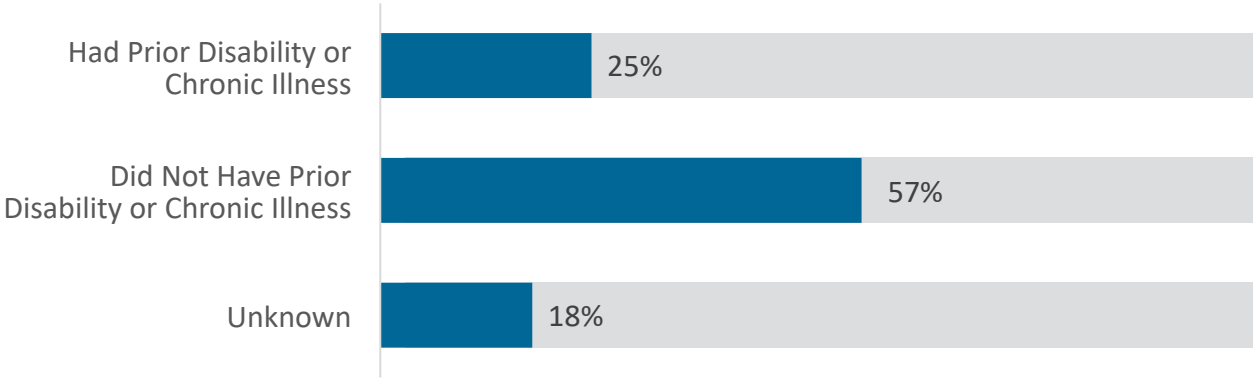
Cognitive or intellectual limitations

Sensory impairments, including those related to vision and hearing

A child may be reported to have had a disability or chronic illness in the NFR-CRS if the child "had a disability or chronic illness prior to the time of incident (leading to the child's death). Chronic implies an impairment or illness that has a substantial long-term effect on the child's day-to-day function or health."

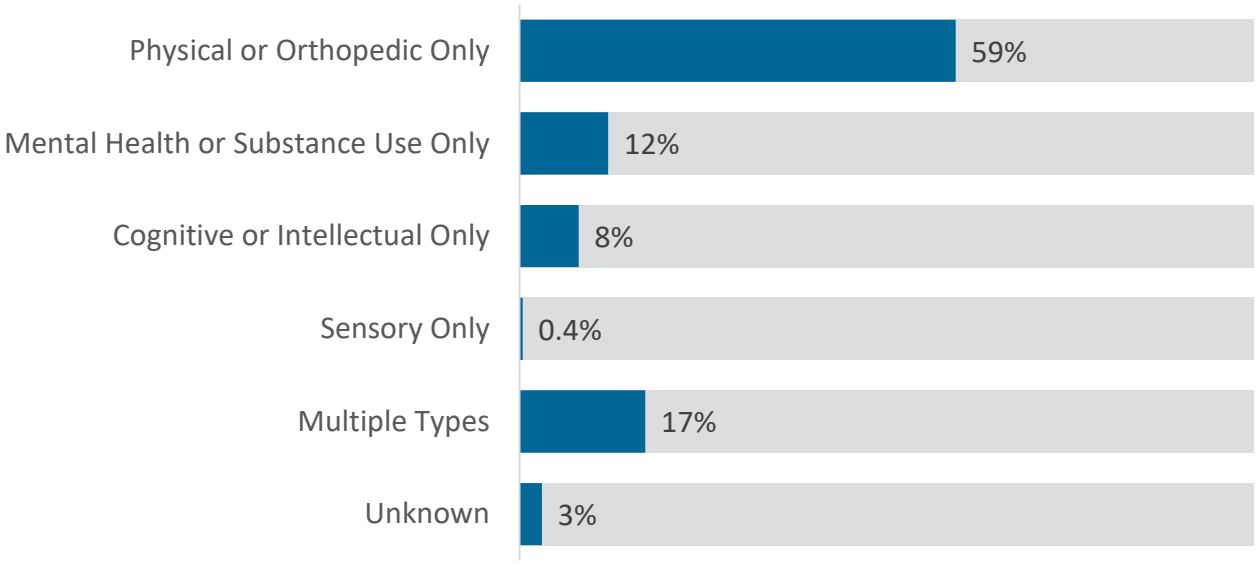
From 2015 to 2019, 25% (n=707) of the children whose deaths were reviewed by local CDR teams were known to have had a prior disability or chronic illness. It was not known if 18% of the children whose deaths were reviewed by a local CDR team had a prior disability or chronic illness.

Chart 24. Deaths Reviewed by Local CDR Teams by Child's Disability Status or Presence of Chronic Illness (2015-2019)



When it was known that the child had a prior disability or chronic illness, the child was most likely to have a physical or orthopedic disability or chronic illness (59%), followed by two or more types of disabilities or chronic illnesses (17%), a mental health or substance use disorder (12%), a cognitive or intellectual disability (8%), or a sensory disability (0.4%). The type of disability or chronic illness was not known for 24 (3%) of the children known to have had a prior disability or chronic illness whose deaths were reviewed by a local CDR team.

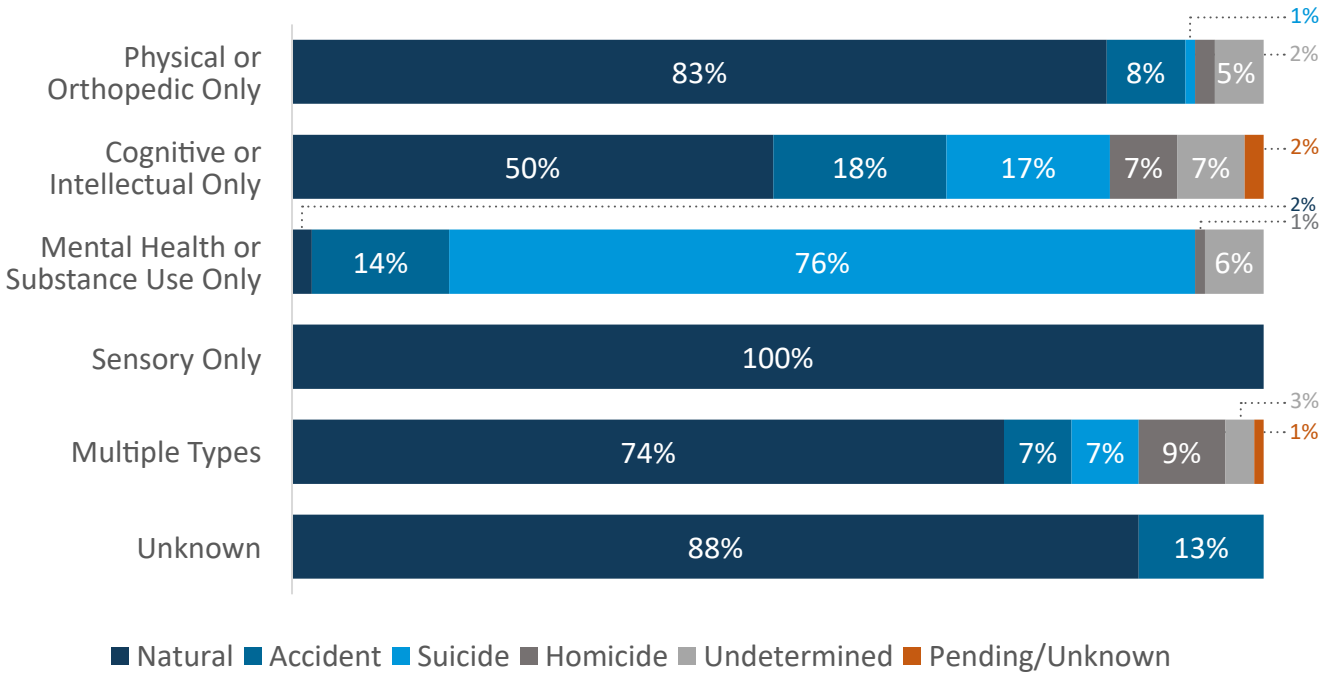
Chart 25. Deaths Reviewed by Local CDR Teams by Type of Child's Disability or Chronic Illness (2015-2019)



Child's Type of Disability or Chronic Illness and Manner of Death Determination

Of the children whose deaths were reviewed by a local CDR team from 2015 to 2019, the manner of death determination for children with a physical or orthopedic disability or chronic illness was most often natural (83%) followed by accident (8%). The manner of death determination for children with a cognitive or intellectual disability was most often natural (50%), followed by accident (18%) and suicide (17%). The manner of death determination for children with a mental health or substance use disorder was most often suicide (76%) followed by accident (14%). The manner of death determination for children with a sensory disability was natural for all deaths reviewed (100%). The manner of death determination for children with more than one type of disability or chronic illness was most often natural (74%), followed by homicide (9%), accident (7%), and suicide (7%). When the type of the child's disability or chronic illness was unknown, the manner of death determination was most likely to be natural (88%) followed by accident (13%).

Chart 26. Manner of Death Determination for Deaths Reviewed by Local CDR Teams by Child's Type of Disability or Chronic Illness (2015-2019)



Selected Types of Death, Opportunities for Prevention, and Recommendations for Policymakers

The sections below provide data related to the following selected manners or causes of death presented alongside promising prevention initiatives and recommendations for policymakers developed by the Child Death State Advisory Team:

- Motor Vehicle and Other Transportation-Related Deaths
- Unintentional Drowning Deaths
- Unintentional Fire-Related Deaths
- Unintentional Poisoning, Overdose, and Acute Intoxication Deaths
- Child Abuse and Child Neglect Deaths
- Firearm-Related Homicides
- Suicides

In an effort to strengthen Michigan's Child Death Review (CDR) Program, the Child Death State Advisory Team recommends that:

- Local Community Action Teams, similar to those embedded in Michigan's Fetal Infant Mortality Review process, are created so that local CDR teams have identified recipients of their findings and recommendations.
- Social media is utilized in prevention education to tailor information to specific populations.
- Training is provided to local CDR team coordinators and team members on how to embed prevention into their review process.
- Education is provided to key state-level partners about the CDR process and the role of these partners in ensuring action is taken on the recommendations of local CDR teams and the Child Death State Advisory Team.

Please contact the Michigan CDR Program at the Center for Child and Family Health at MPHI at keepingkidsalive@mphi.org with any questions or additional data requests.

Motor Vehicle and Other Transportation-Related Deaths

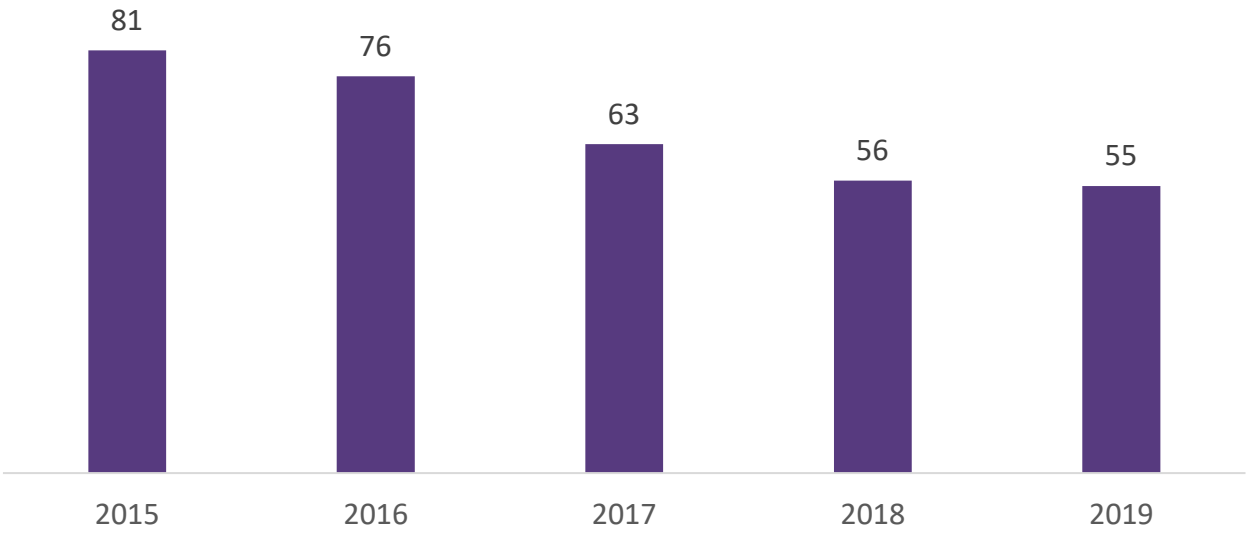
While the rate of death due to unintentional motor vehicle traffic injuries in Michigan is lower than the national average,[18] transportation-related injuries are still the leading cause of fatal injury for Michigan children ages 1 to 18 years old.[1] From 2015 to 2019, transportation-related deaths accounted for 21% of all fatal injury deaths among Michigan children ages 0 through 18 years old.[1]

From 2015 to 2019, Michigan children ages 0 through 18 years old died at an average rate of 3.5 transportation-related deaths per 100,000 children. Children ages four and younger died at an average rate of 2.3 deaths per 100,000 children and those ages 5 to 14 years old died at an average rate of 1.9 deaths per 100,000 children. Adolescents ages 15 to 18 years old died at the highest average rate (8.4 deaths per 100,000 children).[1,12] According to the Children's Safety Network, "teenagers contribute to, and suffer from, the consequences of motor vehicle collisions at a disproportionate rate. Teen drivers ages 16 - 19 are nearly three times as likely as drivers aged 20 or older to be in a fatal crash."[19] Teen drivers are discussed in further detail on page 62.

Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 331 children fatally injured in motor vehicle and other transportation-related incidents. The number varied by year, ranging from 81 deaths reviewed in 2015 to 55 deaths reviewed in 2019.

Chart 27. Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)

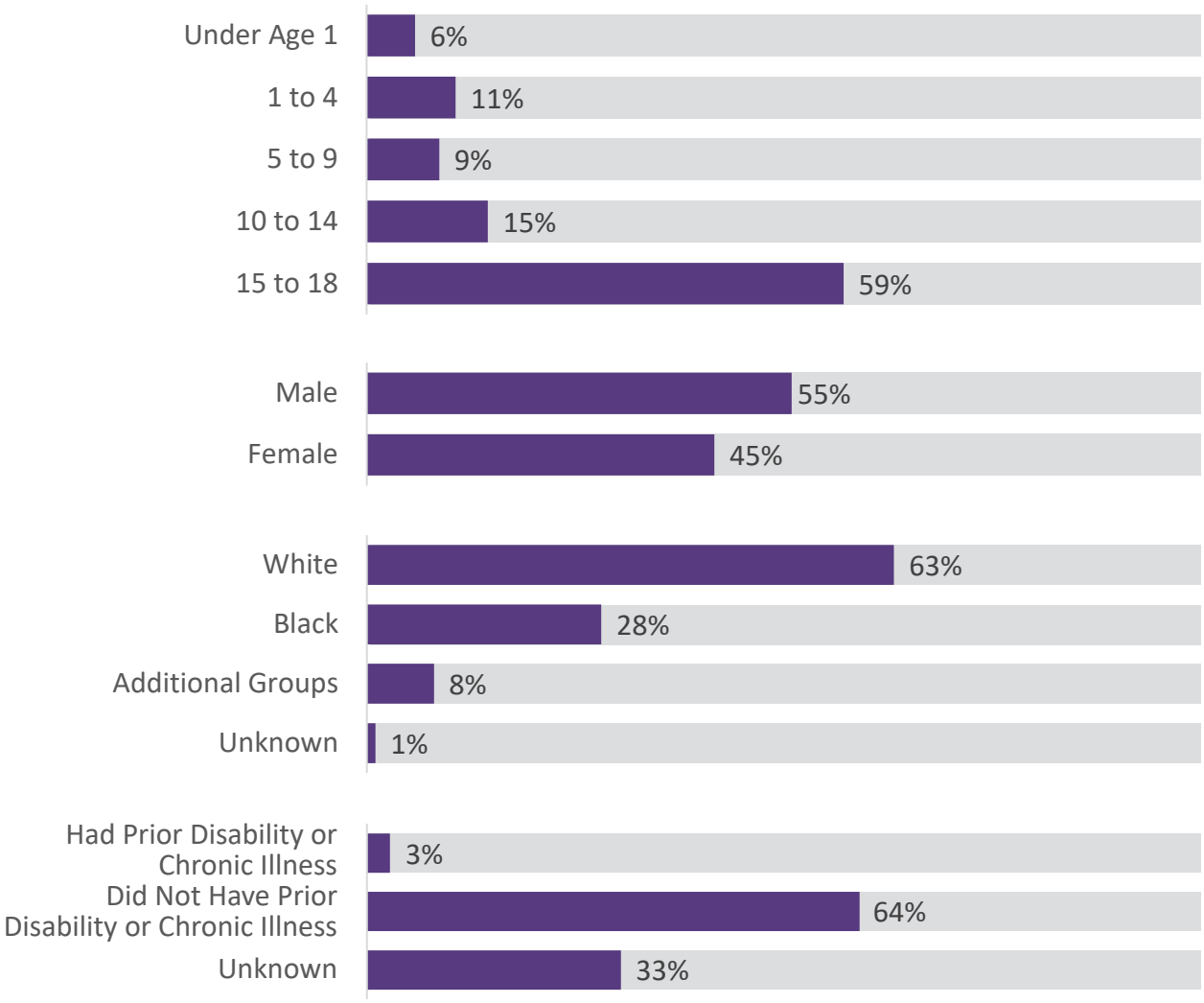


Of the 331 children whose motor vehicle and other transportation-related deaths were reviewed by local CDR teams, 59% were adolescents ages 15 to 18 years old and 55% were male.

The largest percentage of motor vehicle and other transportation-related deaths reviewed by local CDR teams were of white children (63% of deaths reviewed), followed by Black children (28% of deaths reviewed) and children from additional groups, including children who were American Indian, Asian or Pacific Islander, or of multiple races (8% of deaths reviewed).

Three percent of the children whose motor vehicle and other transportation-related deaths were reviewed by a local CDR team were known to have had a prior disability or chronic illness.

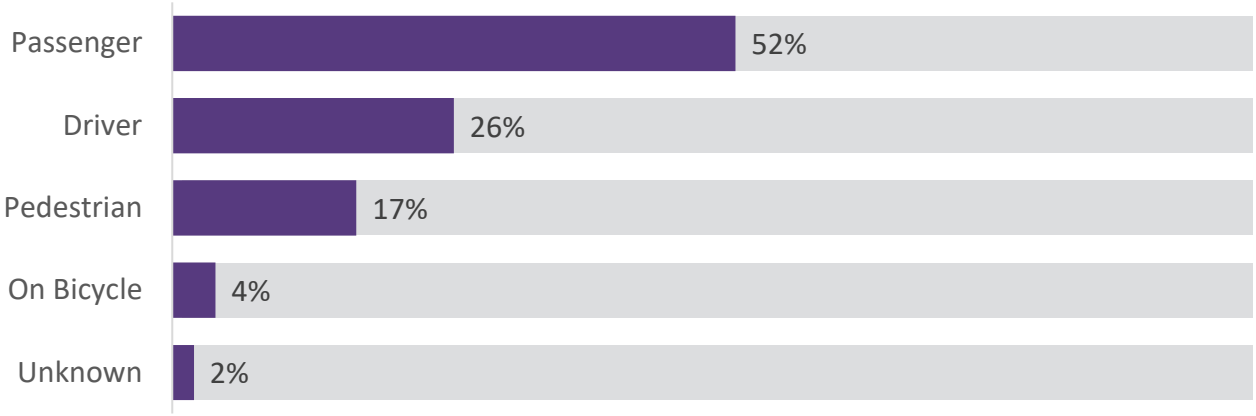
Chart 28. Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)



Note: *Additional groups includes American Indian children, Asian or Pacific Islander children, and children of multiple races.*

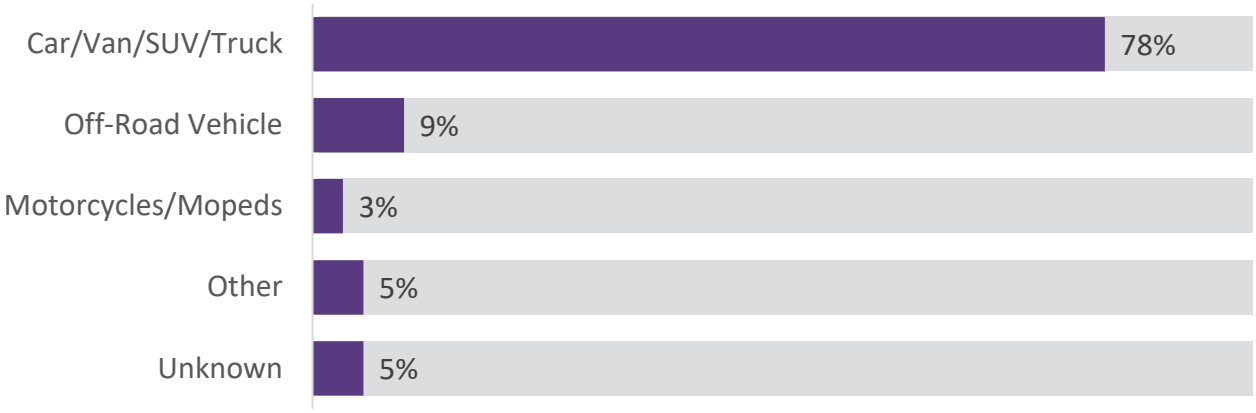
The 331 children who were fatally injured in motor vehicle and other transportation-related incidents whose deaths were reviewed by a local CDR team were most likely to be a passenger in the vehicle (52%), followed by the driver of the vehicle (26%), a pedestrian who was not an occupant of the vehicle (17%), and on a bicycle (4%).

Chart 29. Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams by the Position of the Child in Relation to the Motor Vehicle at the Time of the Incident (2015-2019)



Of the 260 children who were a passenger or driver of the vehicle, more than three-quarters (78%) were in a car, van, truck, or SUV.

Chart 30. Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams by the Child's Vehicle Type for Child Drivers and Child Passengers (2015-2019)



Note: *Off-road vehicle includes ATVs, snowmobiles, mini bikes, and go carts.*
Other vehicle types include horse drawn buggy, bus, tractor, and other farm vehicles.

Presence and Utilization of Protective Measures

According to the Children's Safety Network, "child passenger safety requires consistent use of correctly installed safety seats, booster seats, or seat belts that are appropriate for a child's size and age."[20] Safe Kids Worldwide notes that "more than half of car seats are not used or installed correctly" and "correctly used child safety seats can reduce the risk of death by as much as 71 percent."[21] The National Highway Traffic Safety Administration provides guidance on selecting age-appropriate and size-appropriate protective measures for children (URL: https://bit.ly/3vAkLqU).

Many of the children whose deaths were reviewed by local CDR teams from 2015 to 2019 who were the passenger or driver of a car, van, truck, or SUV were not properly restrained. When a rear or front facing child seat was needed, it was not present, was used incorrectly, or was present and not used for 60% of children. When a belt positioning booster seat was needed, it was not present, was used incorrectly, or was present and not used for 53% of children. Of the children who needed a lap or shoulder belt, 38% were not using them when available or were using them incorrectly.

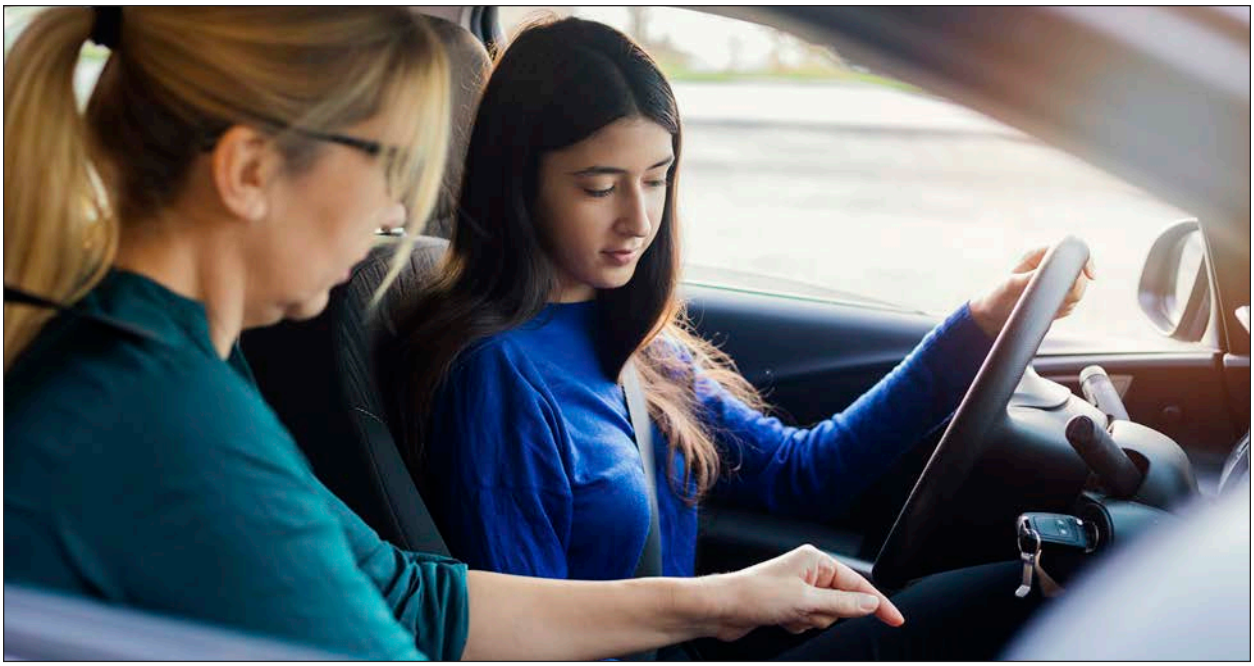
Table 5. Motor Vehicle and Other Transportation-Related Deaths Reviewed by Local CDR Teams by the Presence and Appropriate Utilization of Needed Protective Measures for the Child (2015-2019)

Type of Protective Measure Needed for Child	Not Present	Present and Used Correctly	Present, but Used Incorrectly	Present, but Not Used
Rear/Front Facing Child Seat	17%	40%	33%	10%
Belt Positioning Booster Seat	26%	47%	16%	11%
Lap/Shoulder Belt	1%	60%	5%	33%

Opportunities for Prevention

According to the Children's Safety Network (URL: https://bit.ly/3rLbJGv), child passenger safety can be improved through:

- Child safety seat laws.
- Child safety seat distribution and education.
- Community-wide information and enhanced enforcement campaigns.
- Incentive and education programs that provide rewards to parents and caregivers and/or children for the purchase and proper use of child safety seats.
- Safety seat education that is provided by health care professionals in clinical settings.



Teen Drivers

The Children's Safety Network notes that "male drivers aged 16 – 18, teens driving with teen passengers, and newly licensed teens" are at particularly high risk of being involved in a fatal crash.[19] They found that "teen driver crashes more often involve: driver error, lack of safety belt use, excessive speed, reckless driving, single vehicle crashes, nighttime fatal crashes, increased risk with every additional passenger, distractions, and alcohol and drugs."[19]

From 2015 to 2019, local CDR teams reviewed the deaths of 62 teenagers who were driving a car, van, truck, or SUV at the time of the incident. The most common factors identified as causes of the incident were:

- Speeding over the limit (21%).
- Driver inexperience (14%).
- Traveling at an unsafe speed for conditions (8%).
- Drug or alcohol use (8%).
- Recklessness or the intent of the driver to operate the vehicle in an unsafe manner not conducive to road, weather, and other traffic conditions (7%).

Opportunities for Prevention

According to the Centers for Disease Control and Prevention (CDC), crash risk is highest in the first year a teenager has their license. To reduce this risk, parents and caregivers can:

- Provide at least 30 to 50 hours of supervised driving practice over at least six months.
- Practice on a variety of roads, at different times of the day, and in varied weather and traffic conditions.
- Stress the importance of continually scanning for potential hazards, including other vehicles, bicyclists, and pedestrians.
- Limit teen drivers to zero or one teen passenger for at least the first six months of licensure.
- Require teenagers to wear a seat belt on every trip and in every seating position.
- Prohibit activities that take a teenager's attention away from driving, such as talking on a cell phone, texting, eating, or playing with the radio.
- Lead by example by never drinking and driving and never driving while impaired by other drugs or substances.

Learn more about the Eight Danger Zones for teen drivers through the CDC's Parents are the Key to Safe Teen Drivers (URL: https://bit.ly/3vLdrbQ) campaign. Parents and caregivers can also download a sample Parent-Teen Driving Agreement (URL: https://bit.ly/3EKmNJ3) to clearly define expectations for teen drivers.

Recommendations to Policymakers to Prevent Motor Vehicle and Other Transportation-Related Deaths

The Child Death State Advisory Team offers the following recommendations to policymakers to prevent motor vehicle and other transportation-related deaths:

- Consider having parents ride in driver education cars with the student and instructor in the initial training to increase their effectiveness as driving coaches during the subsequent required supervised parental driving time.
- Enact legislation to update Michigan's child safety seat laws to currently accepted national standards.
- Explore ways of making driver education and training requirements more consistent statewide, along with explicit information provided to parents regarding their roles and responsibilities in their teen's driving education.
- Consider performing a retrospective look at graduated licensing requirements to determine their impact and areas for possible improvement.

Local Initiatives to Prevent Motor Vehicle and Other Transportation-Related Deaths

Several CDR teams have implemented initiatives in their local communities to prevent motor vehicle and other transportation-related deaths, including:

- Dickinson and Iron Counties created a brochure about choosing an appropriate vehicle for teen drivers and assessing vehicle safety and maintenance needs.
- Berrien County increased the number of trained child passenger safety technicians from zero to four over a three-year time period. The child passenger safety technicians provide free child safety seats, assess the safety of a child's existing seat, and collect and replace expired or poorly functioning child seats.
- Kalamazoo County provided education focused on railway safety, including sharing information with local schools and promoting awareness of the Safe Kids Worldwide resource on railroad safety (URL: https://bit.ly/3m6c577).
- Building partnerships with the Amish community to increase awareness of strategies that drivers of motor vehicles can utilize to keep local roadways safe for horse-drawn buggies.

Unintentional Drowning Deaths

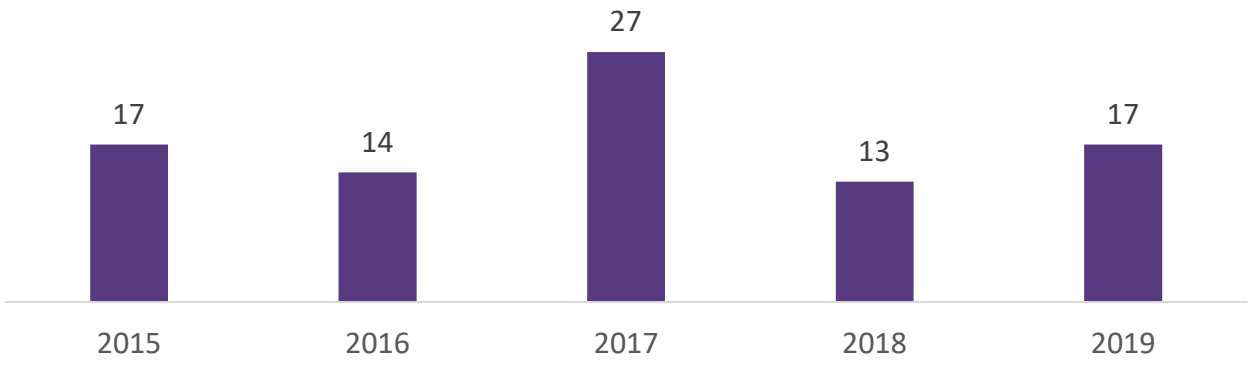
While the rate of death due to unintentional drowning for children has steadily declined nationwide since 1985,[22] drowning is still the leading cause of unintentional injury death for children ages 1 to 4 years old and children in this age group are more likely to die from drowning than any other cause of death except birth defects.[23] Drowning is the third leading cause of unintentional injury death for children ages 5 to 19 years old.[22]

In Michigan, from 2015 to 2019, death due to unintentional drowning was the fifth leading cause of fatal injury among children ages 0 to 18 years old, accounting for 6% of all fatal injuries.[1] Within this five-year period, children ages 0 through 18 died at an average rate of 1.0 deaths per 100,000 children. Children ages four and younger died at an average rate of 1.6 deaths per 100,000 children, children ages 5 to 14 years old died at an average rate of 0.6 deaths per 100,000 children, and adolescents ages 15 to 18 years old died at an average rate of 1.1 deaths per 100,000 children.[1,12]

Unintentional Drowning Deaths Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 88 children who unintentionally drowned. The number varied by year, ranging from 27 deaths reviewed in 2017 to 13 deaths reviewed in 2018.

Chart 31. Unintentional Drowning Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



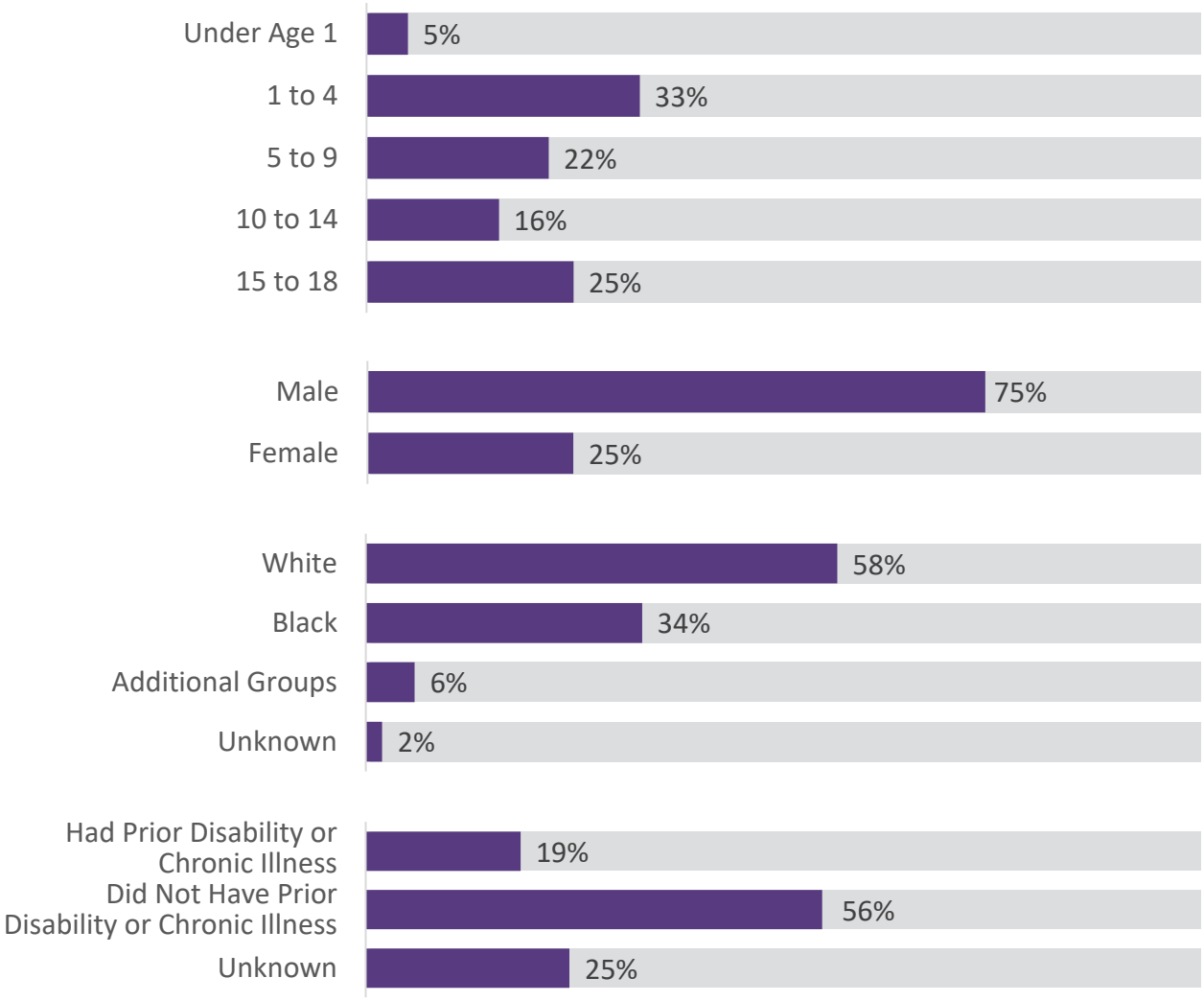
Of the 88 children whose drowning deaths were reviewed by local CDR teams, 5% were children under the age of 1, 33% were children ages 1 to 4 years old, 22% were children ages 5 to 9 years old, 16% were children ages 10 to 14 years old, and 25% were adolescents ages 15 to 18 years old.

Three-quarters of the 88 children whose deaths were reviewed by a local CDR team were male. Nationwide, nearly 80% of people of all ages who fatally drown are male.[24]

In the United States, Black children are more likely to fatally drown than children of other races. These racial disparities are "highest among Black children ages 5-9 (rates 2.6 times higher) and ages 10-14 (rates 3.6 times higher)."[25] According to the Centers for Disease Control and Prevention, Black children ages 10 to 14 years old drown at rates 7.6 times higher than white children in swimming pools. While Black children are more likely to drown in public pools, white children are more likely to drown in residential pools.[24] Of the drowning deaths reviewed by local CDR teams from 2015 to 2019, 58% of the children were white, 34% were Black, and 6% were children from additional groups, including children who were American Indian, Asian or Pacific Islander, or of multiple races.

People with seizure disorders, autism spectrum disorder, or cardiac arrhythmias are at a higher risk of fatally drowning than people without these conditions. According to the American Academy of Pediatrics, "drowning is the most common cause of death from unintentional injury for people with epilepsy" and "the relative risk of fatal and nonfatal drowning in patients with epilepsy varies greatly but is 7.5- to 10-fold higher than that in children without seizures."[22] Among children with autism spectrum disorder, "wandering is the most commonly reported behavior leading to drowning, accounting for nearly 74% of fatal drowning incidents."[22] Cardiac arrhythmias can be triggered by the physical exertion associated with swimming and lead to drowning in people with long QT syndrome. Of the 88 children whose deaths were reviewed by a local CDR team, 19% were known to have had a prior disability or chronic illness. Of the children who were known to have had a prior disability or chronic illness, 41% had a cognitive or intellectual disability, 24% had a physical or orthopedic disability, and 6% had a mental health or substance use disorder. Some children (29%) had more than one type of disability or chronic illness.

Chart 32. Unintentional Drowning Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)

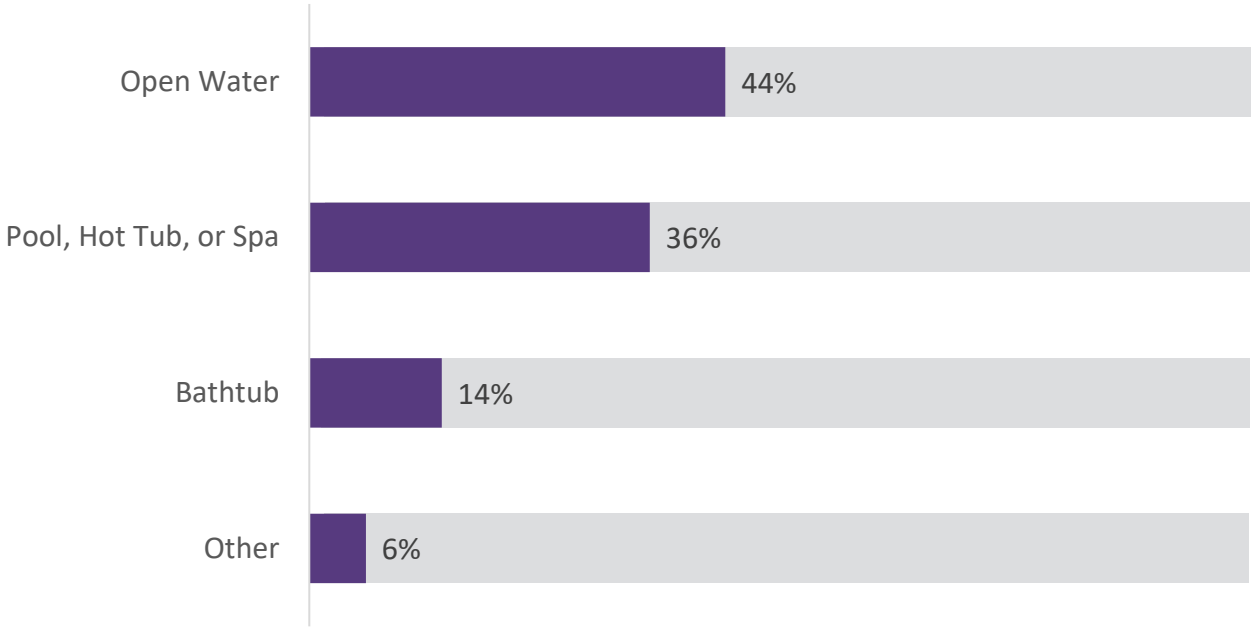


Note: *Additional groups includes American Indian children, Asian or Pacific Islander children, and children of multiple races.*

Drowning Location

Of the unintentional drowning deaths reviewed by local CDR teams from 2015 to 2019, 44% occurred in open water, 36% occurred in a pool, hot tub, or spa, 14% occurred in a bathtub, and 6% occurred in another type of water.

Chart 33. Unintentional Drowning Deaths Reviewed by Local CDR Teams by Drowning Location (2015-2019)



Note: *Other includes additional locations.*

The most common location of fatal drownings varied by the age of the child. Nationwide, two-thirds of all infants who fatally drown do so in a bathtub. Children ages 1 to 4 years old are most likely to drown in a residential swimming pool.[24] Similarly, the Michigan children under the age of 1 whose deaths were reviewed by a local CDR team were most likely to drown in a bathtub (75%). Children ages 1 to 4 years old were most likely to drown in a pool, hot tub, or spa (59%) followed by a bathtub (17%). Children ages 5 to 9 years old were most likely to drown in a pool, hot tub, or spa (42%) followed by in open water (37%). Children ages 10 to 14 years old and adolescents ages 15 to 18 years old were most likely to drown in open water (64% and 86%, respectively) followed by in a pool, hot tub, or spa (29% and 14%, respectively).

Table 6. Unintentional Drowning Deaths Reviewed by Local CDR Teams by Drowning Location and Child's Age (2015-2019)

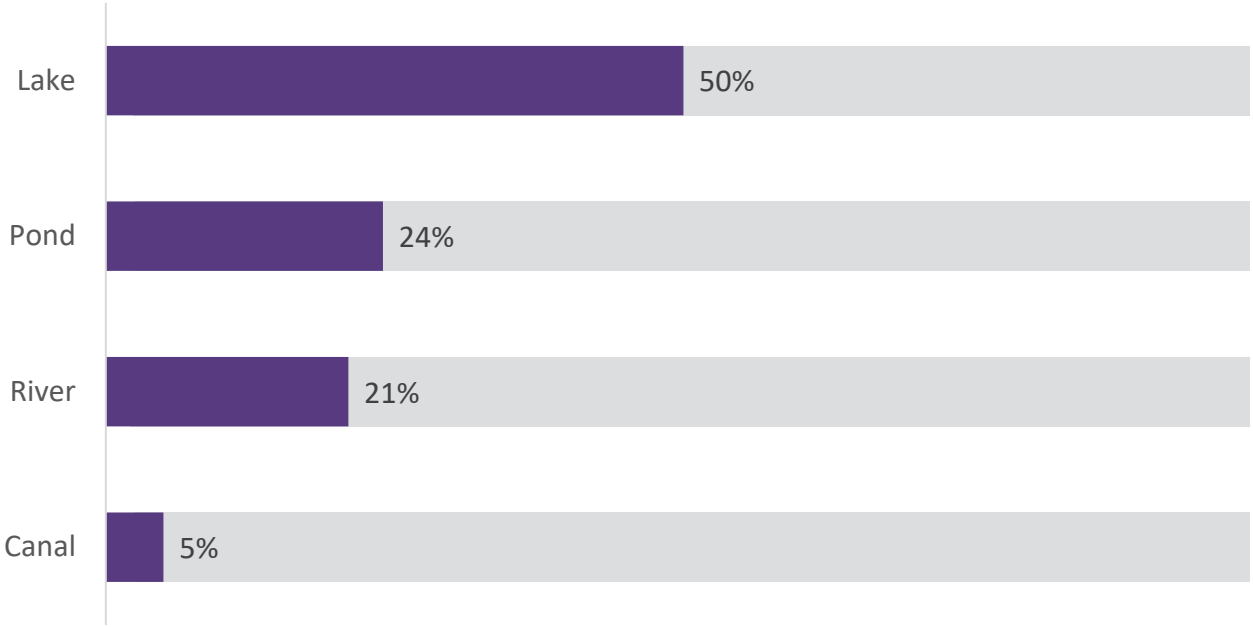
Drowning Location	Under Age 1	Ages 1 to 4	Ages 5 to 9	Ages 10 to 14	Ages 15 to 18
Open Water	0%	14%	37%	64%	86%
Pool, Hot Tub, or Spa	0%	59%	42%	29%	14%
Bathtub	75%	17%	16%	7%	0%
Other	25%	10%	5%	0%	0%

Note: *Other includes additional locations.*

Characteristics of Unintentional Fatal Drownings that Occurred in Open Water

The 38 children whose deaths were reviewed by a local CDR team who drowned in open water were most likely to drown in a lake (50%), followed by in a pond (24%), in a river (21%), or in a canal (5%).

Chart 34. Unintentional Drowning Deaths that Occurred in Open Water Reviewed by Local CDR Teams by Type of Open Water (2015-2019)

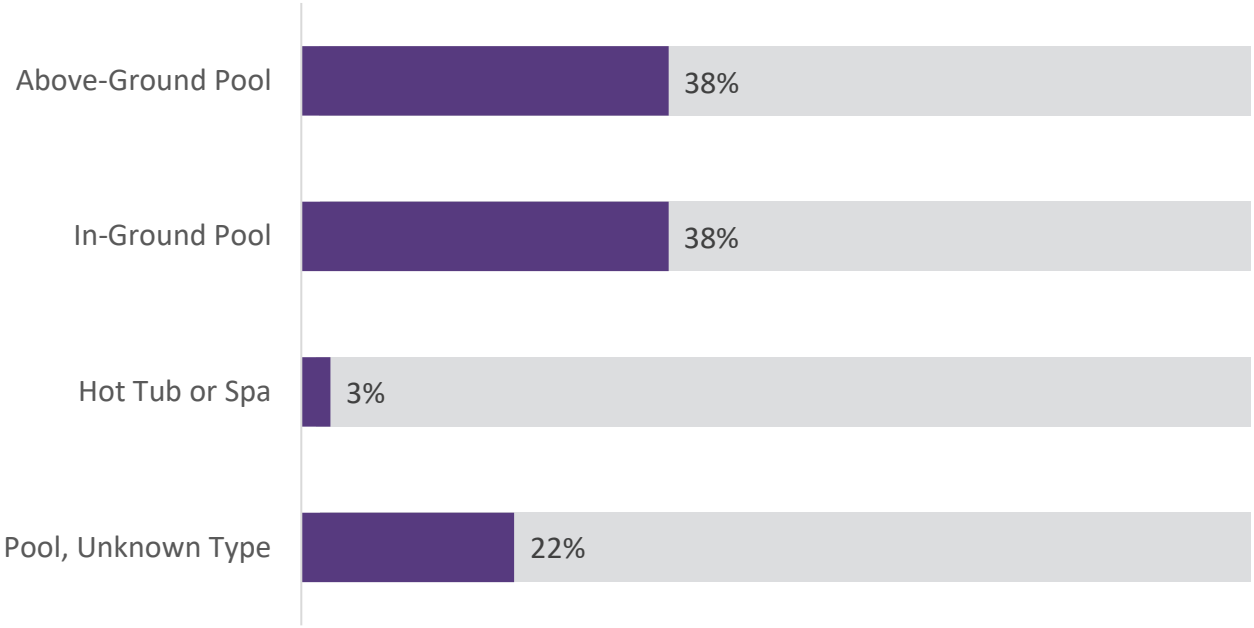


Understanding factors that contributed to the child's death, including the location where the child was last seen alive as well as water, weather, and temperature conditions, offers insight into opportunities to prevent fatal drownings in open water. Almost three-quarters (74%) of the children whose deaths were reviewed by local CDR teams from 2015 to 2019 who drowned in open water were last seen alive in the water. When environmental conditions were known to the local CDR team, current, rough waves, riptide, and undertow were noted as contributing factors in 44% of the children's deaths and a drop-off was noted as a contributing factor in 20% of the children's deaths.

Characteristics of Unintentional Fatal Drownings that Occurred in a Pool, Hot Tub, or Spa

Almost all of the 32 children (97%) whose deaths were reviewed by a local CDR team who drowned in a pool, hot tub, or spa did so in a pool. Children were most likely to drown in an above-ground pool (38% of deaths reviewed) or in an in-ground pool (38% of deaths reviewed). An additional 22% of the children whose deaths were reviewed drowned in a pool of unknown type.

Chart 35. Unintentional Drowning Deaths Reviewed by Local CDR Teams by Type of Pool or Hot Tub/Spa (2015-2019)



Understanding factors that contributed to the child's death, including the location where the child was last seen alive as well as the presence of safety measures, offers insight into opportunities to prevent fatal drownings in pools, hot tubs, and spas. The 32 children who drowned in a pool, hot tub, or spa were last seen alive in a variety of locations, including in the house (32% of deaths reviewed), in the water (29% of deaths reviewed), and poolside (23% of deaths reviewed). When the child drowned in a pool, the pool was most likely to be privately owned (75% of deaths reviewed that occurred in a pool). Barriers or protective layers, such as gates, doors, or alarms, were likely to be breached (47% of deaths reviewed that occurred in a pool) or not in place (16% of deaths reviewed that occurred in a pool).

Opportunities for Prevention

According to the American Academy of Pediatrics (URL: https://bit.ly/36PHPK0) fatal drownings can be prevented by:

- Taking swim lessons (URL: https://bit.ly/3vGRwCW) from a qualified instructor until basic water competence is achieved.
- Implementing additional measures to keep children with disabilities or chronic illnesses safe around water. Parents and caregivers can create a family wandering emergency plan (URL: https://bit.ly/3OxrQkG).
- Installing a four-foot, four-sided isolation fence that separates both above-ground and in-ground pools from the house and the rest of the yard with a self-closing, self-latching gate (URL: https://bit.ly/3MsMbWC).
- Removing the ladder to an above-ground pool may not be enough to prevent children from accessing the pool during non-swim times.
- Consider installing pool alarms, alarms on pool fence gates and house doors, and window guards.
- Emptying inflatable or portable pools, buckets, and bathtubs after every use.
- Never swimming alone. Designating an adult as a water watcher (URL: https://bit.ly/3LkRwyX) who will pay constant attention to children in the water and supervise even if lifeguards are present.
- Never leaving a child alone or in the care of another child near water, including in a bathtub. Stay within arm's reach whenever an infant is in water.
- Installing doorknob covers or latches on bathroom doors and toilets.
- Ensuring all children and all adults wear properly fitted life jackets approved by the U.S. Coast Guard (URL: https://bit.ly/398WCzX) when on or in watercraft. Air-filled swimming aids (e.g., "floaties") should not be used in place of life jackets.
- Choosing safe places to swim (URL: https://bit.ly/393OuRl) and learning to recognize hidden dangers, such as rip currents.
- Learning CPR (URL: https://rdcrss.org/3OyZrdX) and being prepared to offer assistance.

Recommendations to Policymakers to Prevent Unintentional Drowning Deaths

The Child Death State Advisory Team offers the following recommendations to policymakers to prevent drowning deaths:

- Require health care providers to include water safety in their anticipatory guidance with parents adding context that is broader than just their own home pools to include discussion of the possibility of drowning in open water, bathtubs, and on neighbors' property.
- Institute and promote "water watching" programs with the goal of assigning constant supervision of all or a specific set of children to an adult through the use of visual aids like lanyards or bracelets that can be transferred to another adult when necessary to avoid the diffusion of responsibility that can occur when groups recreate around water.

Local Initiatives to Prevent Unintentional Drowning Deaths

Several CDR teams have implemented initiatives in their local communities to prevent drownings and other fatalities on Michigan's beaches, including:

- Grand Traverse County formed a multi-disciplinary group that received grant-funding to promote water safety. Activities included setting up 39 rescue stations around the area with throw rings, rope, and instructions, posting signage that describes what drowning looks like, hosting family-friendly water safety events, promoting swim lessons, and maintaining a robust social media presence with links to a wide variety of information and resources about swimming, boating, life vests, ice thickness, e. coli contamination in local waterways, and related topics.
- Berrien County partnered with county and city beaches to have "flags" posted along the coastline in highly visible areas to alert people to swimming and water conditions. Discussions are underway to increase the safety of piers during "red flag" days, including assessing the feasibility of installing barriers to prevent access to the piers.
- Van Buren County, in partnership with Safe Kids Greater South Haven, compiled national resources to highlight the dangers associated with the sudden collapse of sand tunnels that children may create on the beach.

Unintentional Fire-Related Deaths

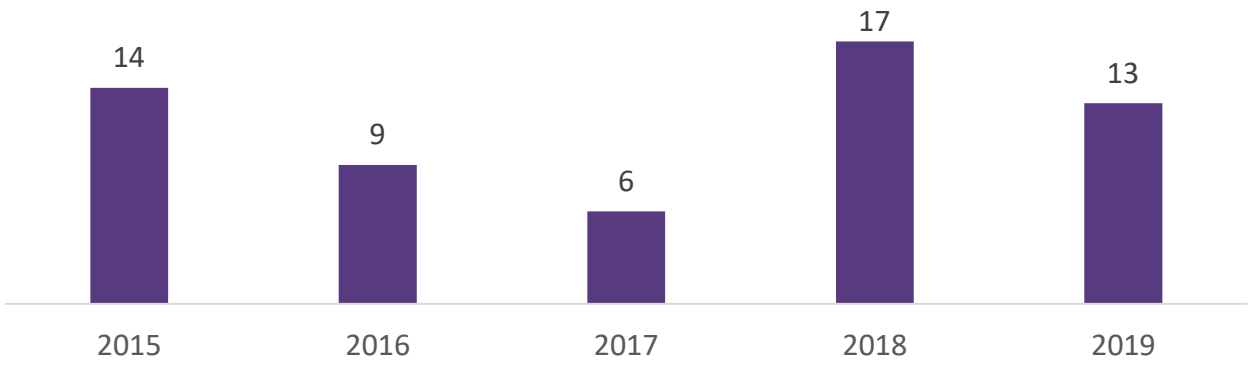
While the fire death rate is lower for children than for the general population, fires and burns are still the fifth leading cause of unintentional injury-related deaths for children from birth through age 19 in the United States. Nationwide, nearly 300 children die from fire or burn injuries each year.[26] Children ages four and younger are at a higher risk of fire death than older children and accounted for 44% of all child fire deaths.[27]

In Michigan, accidental fire and flame deaths accounted for 2% of all fatal injuries to children 0 to 18 years old from 2015 to 2019.[1] Within this five-year period, Michigan children ages 0 through 18 died at an average rate of 0.4 deaths per 100,000 children. Children ages four and younger died at the highest average rate (0.7 deaths per 100,000 children), followed by children ages 5 to 14 years old (0.3 deaths per 100,000 children) and adolescents ages 15 to 18 years old (0.1 deaths per 100,000 children).[1,12]

Unintentional Fire-Related Deaths Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 59 children who died due to unintentional fires. The number varied by year, ranging from 17 deaths reviewed in 2018 to 6 deaths reviewed in 2017.

Chart 36. Unintentional Fire-Related Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



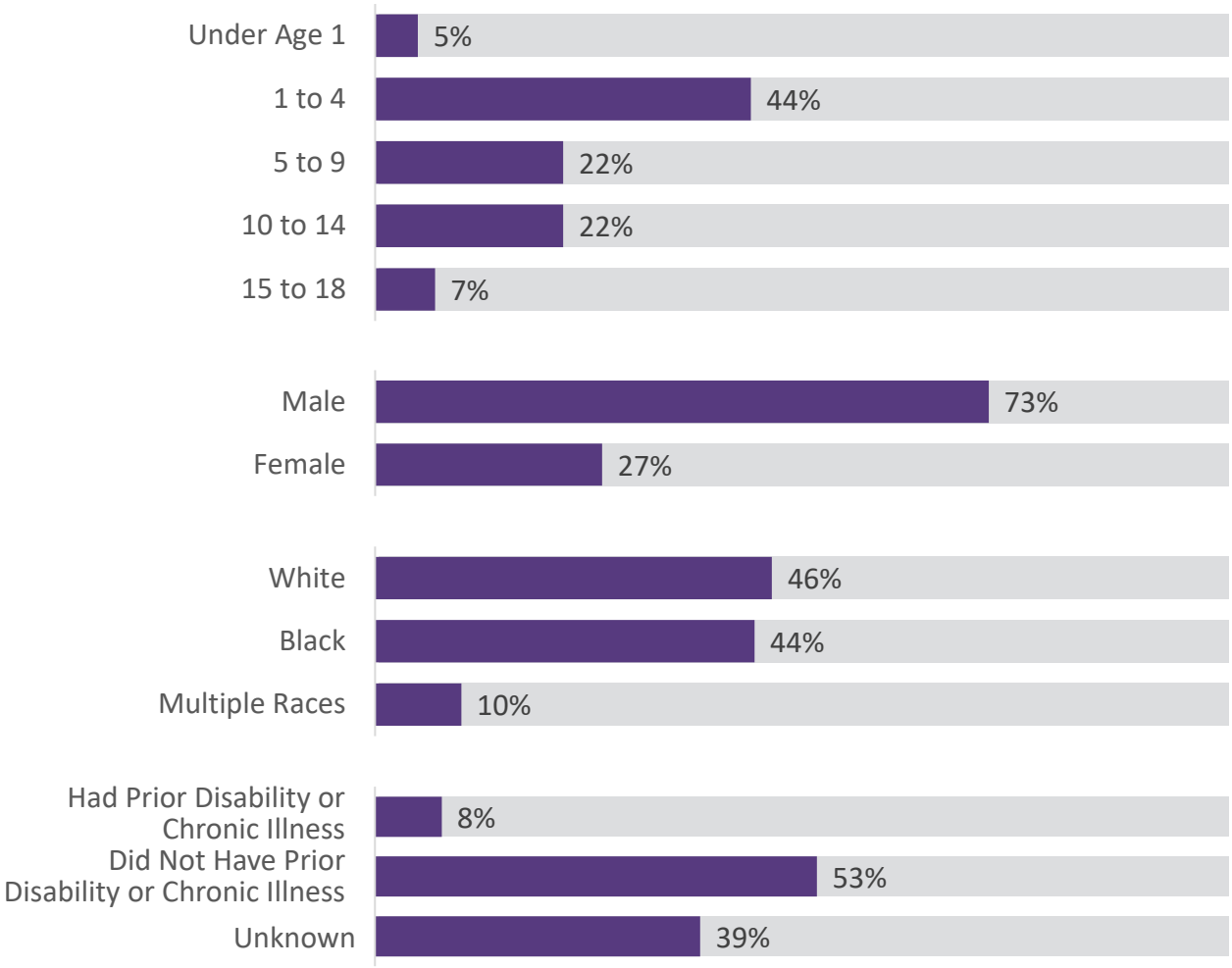
Of the fire-related deaths reviewed by local CDR teams from 2015 to 2019, almost half were among children ages four and younger (49%). Children ages 5 to 9 years old and children ages 10 to 14 years old each accounted for 22% of the deaths reviewed by local CDR teams. Local CDR teams were least likely to review the deaths of adolescents ages 15 to 18 years old who died due to unintentional fires (7%); however, this age group has the lowest rate of accidental fire and flame-related deaths among Michigan children.

Nearly three-quarters (73%) of the deaths reviewed by local CDR teams were of male children. Nationwide, male and female children ages 0 to 14 years old were equally likely to die due to fires.[27]

Local CDR teams reviewed the deaths of a similar percentage of white and Black children (46% and 44%, respectively). An additional 10% of the deaths reviewed were of children of multiple races. Nationwide, "African Americans constituted a large and disproportionate share of fire deaths, accounting for 24% of fire deaths among children in 2019 but for only 15% of the child population. Moreover, African American children ages 4 or younger had a relative risk of dying that was 20% less than the general population but 1.7 times higher than for all children in that age group."[27]

Eight percent of the children whose fire-related deaths were reviewed by a local CDR team from 2015 to 2019 were known to have had a prior disability or chronic illness.

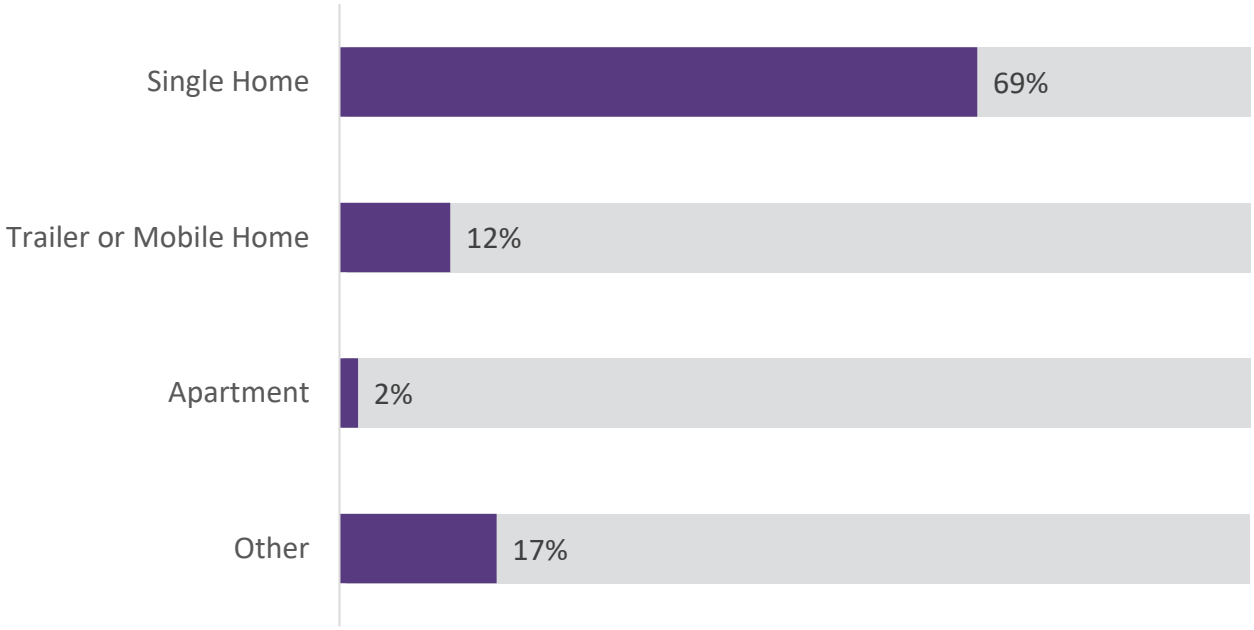
Chart 37. Unintentional Fire-Related Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)



Characteristics of Unintentional Fire-Related Deaths

Most fire-related deaths reviewed by local CDR teams from 2015 to 2019 occurred in a single home (69%). An additional 12% occurred in a trailer or mobile home and 2% occurred in an apartment. Seventeen percent of the deaths reviewed occurred in another location, including an extended stay hotel, townhouse, or camper.

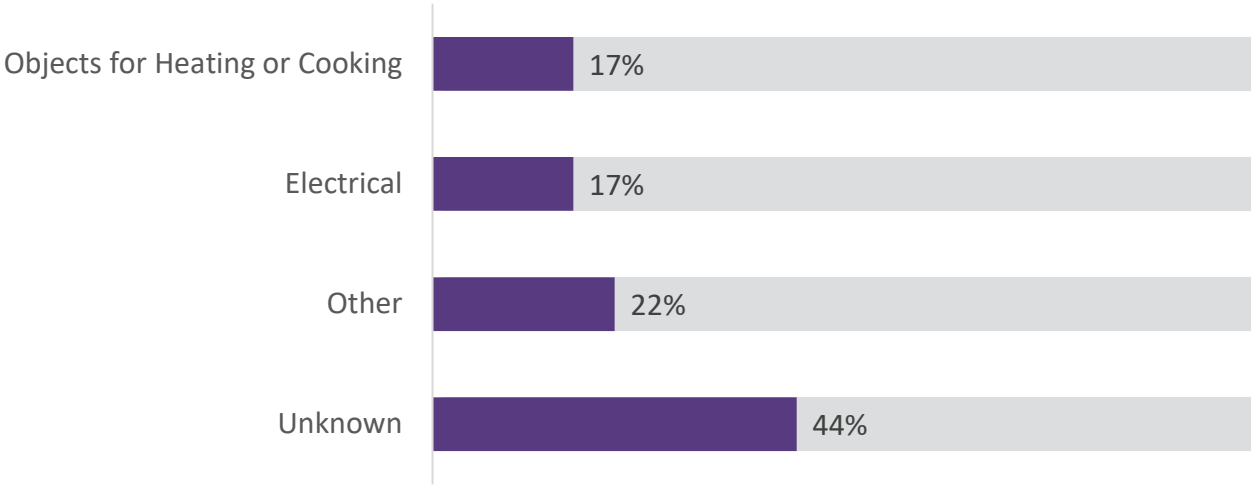
Chart 38. Unintentional Fire-Related Deaths Reviewed by Local CDR Teams by Type of Building or Structure (2015-2019)



Note: *Other includes additional locations, such as extended stay hotel, townhouse, and camper.*

The source of the fire was unknown for almost half (44%) of the fire-related deaths reviewed by local CDR teams. When the source of the fire was known, the most commonly identified sources were objects used for cooking or heating (including stoves, grills, space heaters, and furnaces) and electrical (including wiring, outlets, and extension cords).

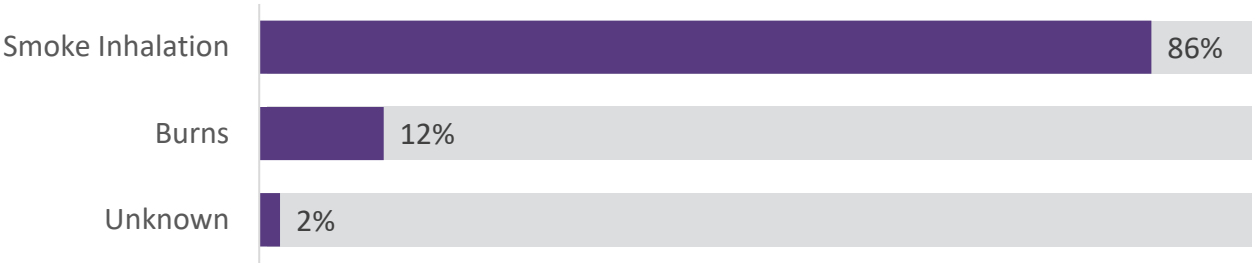
Chart 39. Unintentional Fire-Related Deaths Reviewed by Local CDR Teams by the Source of the Fire (2015-2019)



Note: *Other includes additional fire sources such as candles, cigarettes and cigars, matches and lighters, and hookahs.*

Most of the fire-related deaths reviewed by local CDR teams were caused by smoke inhalation (86%) followed by burns (12%).

Chart 40. Unintentional Fire-Related Deaths Reviewed by Local CDR Teams by Cause of Death (2015-2019)



Opportunities for Prevention

According to the American Red Cross (URL: https://rdcrss.org/3rTzWdF), people may have as little as two minutes to escape once a fire starts. The following strategies can save lives:

- Install, properly maintain, and regularly test smoke alarms (URL: https://rdcrss.org/36JIsVd) on every level of your home, inside bedrooms, and outside sleeping areas.
- Work with all family members to create and regularly practice (URL: https://bit.ly/3scYZJ5) a fire escape plan (URL: https://rdcrss.org/3Ouu3gR) that includes two ways to escape from each room in the home. Have a plan for young children (URL: https://bit.ly/38licku) and children with disabilities who may not be able to get outside by themselves.
- If a fire occurs in your home, "get out, stay out, and call for help." Go to your meeting space and never go back inside for anything or anyone.
- Consider having one or more working fire extinguishers (URL: https://rdcrss.org/36JIsVd) in the home and learning how to properly use them. Only adults should use fire extinguishers.
- Choose an appropriate extension cord (URL: https://bit.ly/3EJD7d4), use it as specified, and discard older or damaged extension cords.
- Keep smoking materials, lighters, and matches in a location that children cannot access and teach children never to play with these items.

Recommendations to Policymakers to Prevent Unintentional Fire-Related Deaths

The Child Death State Advisory Team offers the following recommendations to policymakers to prevent unintentional fire-related deaths:

- Expand the proven-effective Sound Off program to more school systems around the state to teach young children about fire safety and aide in getting working smoke detectors into homes that lack them.
- Consider joining other states that have banned the sale of smoke detectors that rely on removable batteries that must be changed every year in order to function.

Local Initiatives to Prevent Unintentional Fire-Related Deaths

Several CDR teams have implemented initiatives in their local communities to prevent unintentional fire-related deaths, including:

- Berrien County partnered with local municipalities to compile a county-wide list of all multi-family dwellings. Several cities are working to create ordinances requiring annual building inspections to ensure local fire codes are met, including the presence of working smoke alarms.

Unintentional Poisoning, Overdose, and Acute Intoxication Deaths

According to the Children's Safety Network, unintentional poisoning is the fourth leading cause of unintentional injury death for children ages 0 to 19 years old in the United States. From 2016 to 2019, the average rate of death due to unintentional poisoning among children was 0.9 deaths per 100,000 children.[28]

In Michigan, from 2015 to 2019, death due to accidental poisoning was the sixth leading cause of fatal injury among children ages 0 to 18 years old, accounting for 5% of all fatal injuries.[1] Within this five-year period, Michigan children ages 0 through 18 died at an average rate of 0.9 deaths per 100,000 children. Children ages four and younger died at an average rate of 0.5 deaths per 100,000 children and children ages 5 to 14 years old died at an average rate of 0.3 deaths per 100,000 children. Adolescents ages 15 to 18 years old died from accidental poisoning at the highest average rate (2.7 deaths per 100,000 children).[1,12]

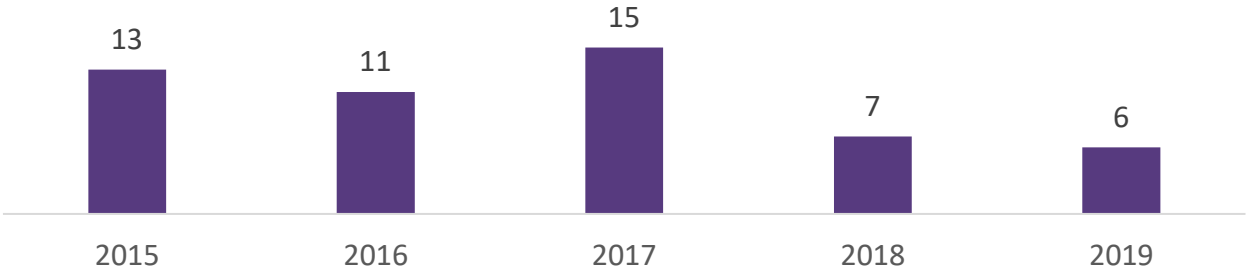
Unintentional Poisoning, Overdose, and Acute Intoxication Deaths Reviewed by Local CDR Teams

Deaths reviewed by local CDR teams include those due to:

- Poisoning, which occurs when a substance not meant for human consumption is ingested and causes death.
- Overdose, which occurs when a substance for which a safe dosage has been established (e.g., pain and other types of prescribed medications) is ingested in excess and causes death.
- Acute intoxication, which occurs when a substance for which no safe dosage has been established (e.g., cocaine and other types of illegal or illicit substances) is ingested and causes death.

From 2015 to 2019, local CDR teams reviewed the deaths of 52 children who died due to unintentional poisoning, overdose, or acute intoxication. The number varied by year, ranging from 15 deaths reviewed in 2017 to 6 deaths reviewed in 2019.

Chart 41. Unintentional Poisoning, Overdose, and Acute Intoxication Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



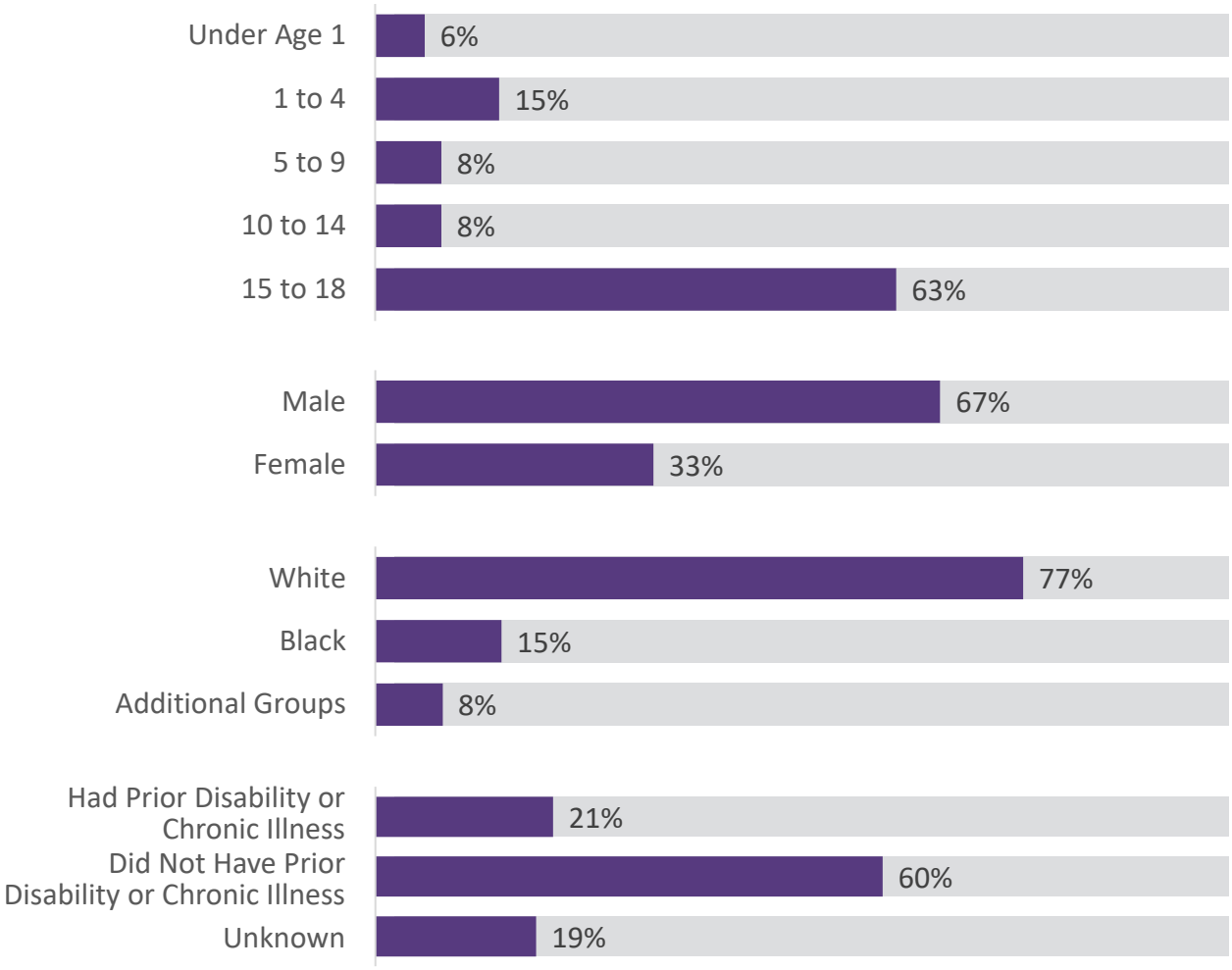
Of the deaths due to unintentional poisoning, overdose, or acute intoxication reviewed by local CDR teams from 2015 to 2019, nearly two-thirds (63%) were of adolescents ages 15 to 18 years old. Children ages four and younger accounted for an additional 21% of the deaths reviewed.

Over two-thirds (67%) of the deaths reviewed by local CDR teams were of male children. From 2014 to 2016 in the United States, males ages 10 to 19 years old had a higher rate of death from drug poisoning than females (2.1 and 0.9 deaths per 100,000 children, respectively).[29]

The majority of deaths due to unintentional poisoning, overdose, or acute intoxication reviewed by local CDR teams were among white children (77%), followed by Black children (15%) and children from additional groups (8%), including American Indian children and children of multiple races. According to the Centers for Disease Control and Prevention, "poisoning death rates increased 50% among Hispanic children and 37% among Black children, while rates among white children decreased by 24%" from 2010 to 2019.[30] Nationwide, white children and American Indian or Alaska Native children ages 10 to 19 years old had the highest rates of death due to drug poisoning from 2014 to 2016 (2.1 and 1.7 deaths per 100,000, respectively).[29]

More than one in five (21%) of the children whose deaths due to unintentional poisoning, overdose, or acute intoxication were reviewed by a local CDR team from 2015 to 2019 were known to have had a prior disability or chronic illness. Of the children who were known to have had a prior disability or chronic illness, 64% had a mental health or substance use disorder, 9% had a physical or orthopedic disability, and 9% had a cognitive or intellectual disability. Some children (9%) had more than one type of disability or chronic illness.

Chart 42. Unintentional Poisoning, Overdose, and Acute Intoxication Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)

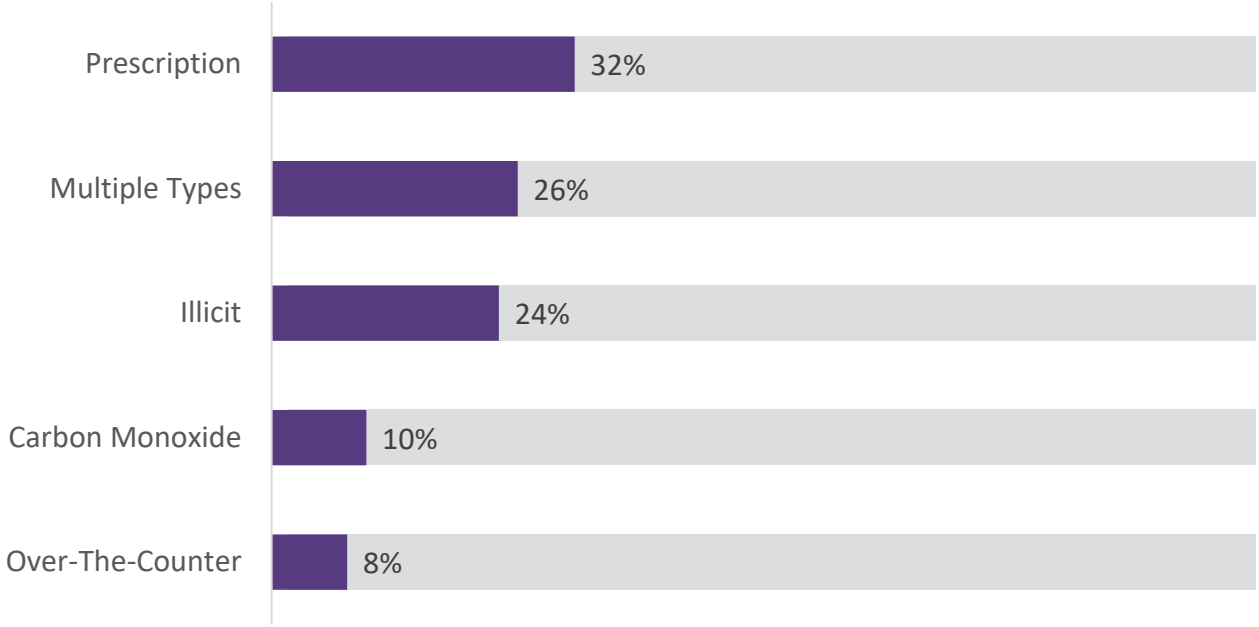


Note: *Additional groups includes American Indian children and children of multiple races.*

Substances Involved

In an effort to better inform prevention initiatives, local CDR teams identify the type(s) of substances involved in the deaths of children due to unintentional poisoning, overdose, or acute intoxication. These substances include prescription drugs (e.g., antidepressants, opioids, and non-opioids), illicit drugs (e.g., opioids, non-opioids, cocaine, heroin), over-the-counter drugs (e.g., pain medication, cold medicine), and other substances (e.g., alcohol, carbon monoxide, other fumes, gas, or vapor). Of the 52 deaths reviewed by local CDR teams from 2015 to 2019, 32% involved prescription drugs, 26% involved multiple types of substances, 24% involved illicit drugs, 10% involved carbon monoxide, and 5% involved over-the-counter drugs.

Chart 43. Unintentional Poisoning, Overdose, and Acute Intoxication Deaths Reviewed by Local CDR Teams by Type of Substance Involved (2015-2019)



Opportunities for Prevention

The Centers for Disease Control and Prevention's Up and Away campaign (URL: https://bit.ly/3MvswFu) offers strategies to reduce children's access to prescription and over-the-counter medications. Parents and caregivers can keep children safe by:

- Putting medicines up and away and out of children's reach and sight. Consider securing medicines in a lockbox, cabinet, or drawer.
- Ensuring medicines are put away every time.
- Always relocking the safety cap on medicine containers after every use.
- Teaching children about medicine safety (URL: https://bit.ly/3LezM8w) and never telling children medicine is candy to get them to take it.
- Talking to children (URL: https://bit.ly/395b7ow) and teenagers (URL: https://bit.ly/3k9ayMH) about substance use.
- Utilizing year-round drug disposal boxes or participating in the National Prescription Drug Take Back Day (URL: https://bit.ly/37Jm7aX). Most communities have local drop-off locations where anyone can properly dispose of controlled substances (URL: https://bit.ly/3xO2sRT).
- Being prepared in case of an emergency and programming the number for Poison Control (URL: https://bit.ly/3K8ZEkB) into phones (800-222-1222).
- Understanding the role of prescription drug monitoring programs (PDMPs) (URL: https://bit.ly/3Kj2PGy) in reducing prescription medication misuse.
- Learning about the principles of harm reduction (URL: https://bit.ly/3xRlarH) and identifying harm reduction resources (URL: https://bit.ly/36L1SZT) in the local community.

Recommendations to Policymakers to Prevent Deaths Due to Unintentional Poisoning, Overdose, or Acute Intoxication

As Michigan adolescents died due to accidental poisoning at a higher rate than any other age group, the Child Death State Advisory Team offers the following recommendations, which are intended to identify and address risk factors associated with youth substance use and support well-being for all youth, to policymakers to prevent deaths due to unintentional poisoning, overdose, or acute intoxication:

- Consider conducting Adverse Childhood Experiences (ACEs)/trauma screenings with children in a comfortable setting in schools to encourage disclosure of issues that children may not feel comfortable talking to their primary care providers about in front of their parents/caregivers.
- Explore ways to develop knowledge about the effects of trauma on children and the will to increase resources that support children and families in a trauma-informed manner.
- Include more modern ways of tailoring substance use prevention education to youth (e.g., TikTok).

Child Abuse and Child Neglect Deaths

According to the Centers for Disease Control and Prevention, "child abuse and neglect are serious public health problems and adverse childhood experiences (ACEs) (URL: https://bit.ly/37LZgeJ) that can have long-term impact on health, opportunity, and wellbeing."[31] Unfortunately, accurate and thorough identification of child abuse and child neglect deaths presents unique challenges. According to the National Center for Fatality Review and Prevention, "numerous studies have demonstrated that child maltreatment fatalities are under-reported by as much as two to three times the actual number in state and national reporting systems."[32] Barriers to fully identifying all child maltreatment-related deaths include differing or limited definitions of child abuse and child neglect, varying death investigation practices, inconsistent coding on death certificates, and the use of single data sources to identify these deaths.[33,34] In an effort to identify solutions to these challenges, "studies have also shown that the child death review process leads to more deaths being identified as due to maltreatment … (because) records from multiple disciplines are shared, additional information comes to light regarding the circumstances, CDR leads to improved investigations, and CDR teams often use definitions for maltreatment that are broader than those required by CPS (Children's Protective Services) and the justice system."[32]

While likely an underestimate of the true number,[35] in the United States, at least 1 in 7 children experienced child abuse or child neglect in the past year and 1,840 children died as a result of child abuse or child neglect in 2019 alone (a rate of 2.5 per 100,000 children in the general population).[31,36] From 2015 to 2019, an average of 1,744 children nationwide died each year as a result of child abuse or child neglect.[36]

In Michigan, a total of 332 children died as a result of child abuse or child neglect from 2015 to 2019, which is an average rate of 3.0 deaths per 100,000 population.[34] According to national estimates for 2019, nearly three-quarters (70.3%) of child abuse or child neglect-related deaths in the United States involved children younger than 3 years old.[34,36] The young age of the children who died due to child abuse or child neglect may make accurately identifying these deaths particularly challenging because, nationwide, "as many as half or more fatalities involve children unknown to the local CPS agency before the death occurred."[33] Child maltreatment fatality rates tend to decrease as the child's age increases.

Child Abuse and Child Neglect Deaths Reviewed by Local CDR Teams

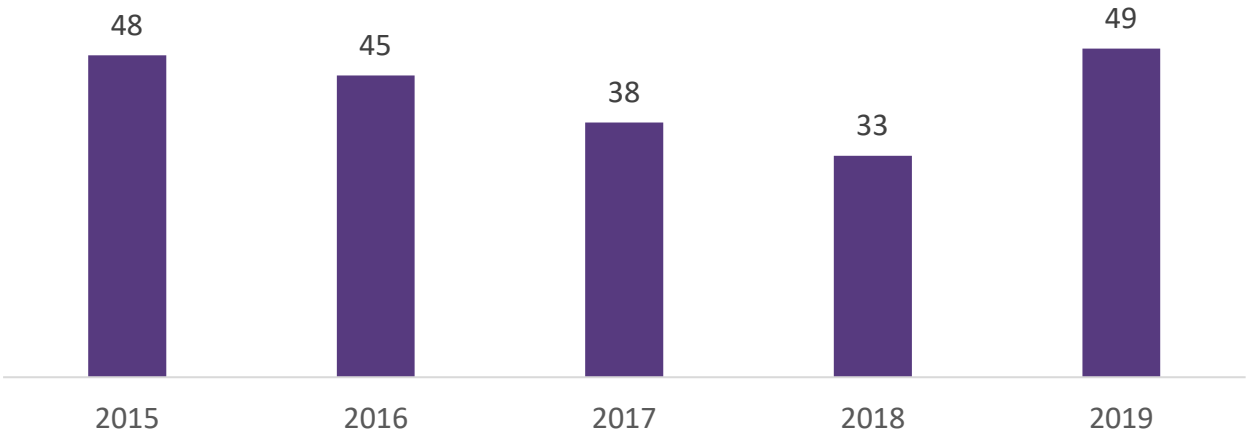
When local CDR teams review the death of a child, they are asked to indicate if they believe any behavior on the part of a parent, caregiver, or supervisor caused or contributed to the child's death. This team discussion is not intended to determine blame or legal culpability and the following data does not reflect counts of child abuse or child neglect deaths reported by other entities, such as the MDHHS Children's Protective Services Program Office or the MDHHS Division for Vital Records and Health Statistics.

The following data describes the children's deaths that local CDR teams believed child abuse or child neglect caused or contributed to. The National Fatality Review-Case Reporting System (NFR-CRS) provides the following definitions:

- A behavior that causes death is a behavior that in and of itself led to the child's death. Generally, the behavior in question was both necessary and sufficient to kill the child.
- A behavior that contributes to death is a behavior that plays a role in the child's death.
- Child abuse is any injury inflicted on a child by a parent, caregiver, or supervisor regardless of the intent to hurt the child.
- Child neglect is defined as a failure on the part of a parent, caregiver, or supervisor to provide for the shelter, safety, supervision, and nutritional needs of a child that results in harm to the child. Child neglect includes physical, medical, supervisory, and emotional neglect.

From 2015 to 2019, local CDR teams reviewed the deaths of 213 children that they believed child abuse or child neglect caused or contributed to. The number varied by year, ranging from 49 deaths reviewed in 2019 to 33 deaths reviewed in 2018.

Chart 44. Child Abuse and Child Neglect Deaths Reviewed by Local CDR Teams by Year of Review (2015-2019)



Child Abuse Deaths Reviewed by Local CDR Teams

Local CDR teams believed child abuse caused or contributed to 118 out of the 213 (55%) total deaths reviewed. The most common types of child abuse identified by local CDR teams were abusive head trauma (43%) and abuse from beating or kicking (23%), followed by other types of abuse including fatal injuries caused by firearms or sharp objects (12%), suffocation or strangulation (9%), chronic battered child syndrome (7%), poisoning (4%), and scalding or burning (2%).

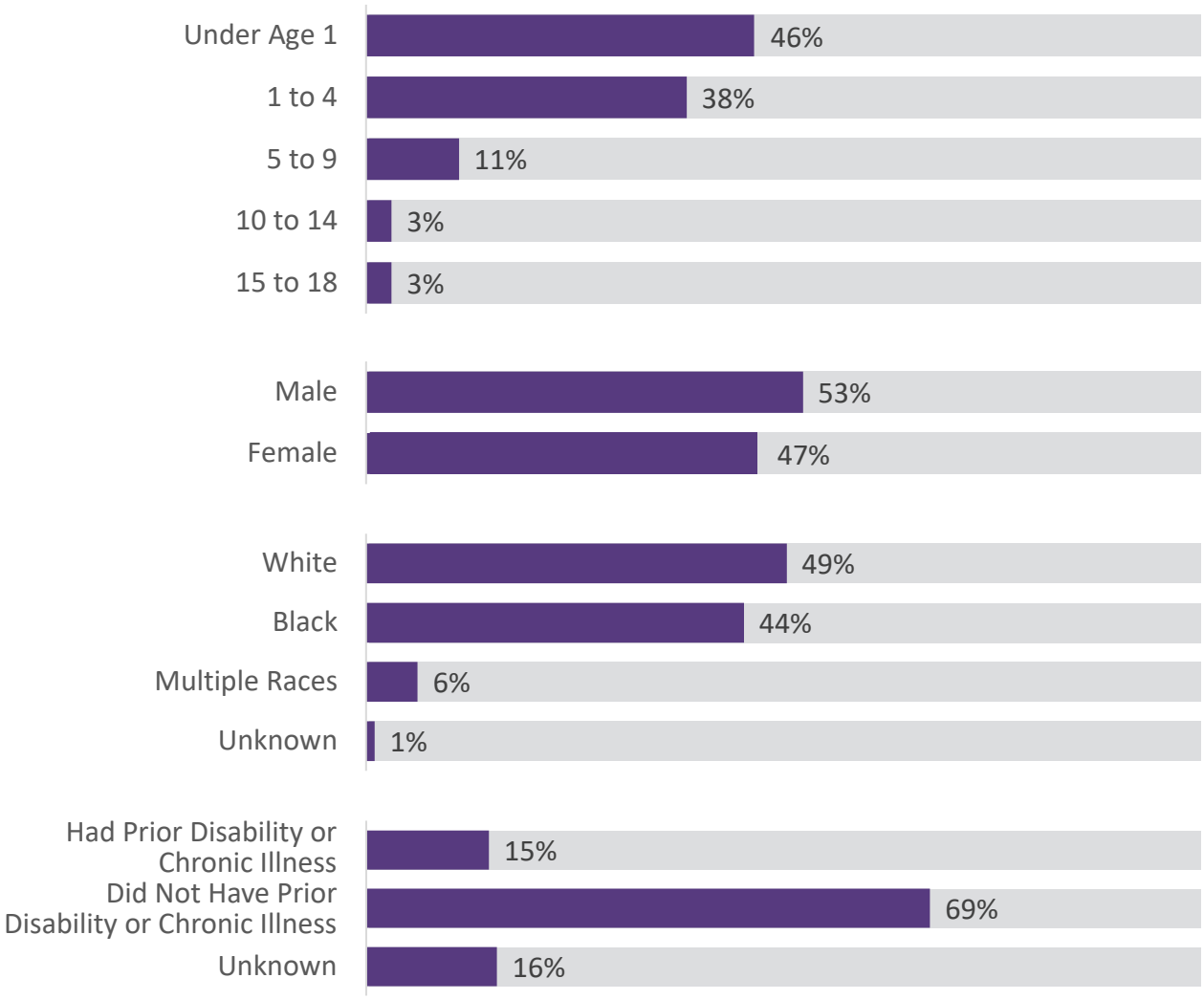
Local CDR teams are asked to identify up to two individuals who caused or contributed to the child's death. At least one perpetrator was identified for 92% of the children whose child abuse-related deaths were reviewed. When known, the perpetrator(s) of the abuse was most likely to be the child's biological father (33% of child abuse deaths reviewed), the child's biological mother (32% of deaths reviewed), and/or the child's mother's partner (24% of deaths reviewed). Other known types of perpetrators included the child's relative, such as a grandparent, stepparent, sibling, or other relative (7%), and other types of people, such as a babysitter or the child's mother's friend (5%).

The majority of deaths reviewed by local CDR teams where child abuse caused or contributed to the death were of children ages four and younger (84%). Local CDR teams were slightly more likely to review the deaths of male children than female children (53% and 47%, respectively).

The child abuse-related deaths of white children were most likely to be reviewed by local CDR teams (49%), followed by Black children (44%) and children of multiple races (6%). According to the Commission to End Child Abuse and Neglect Fatalities (2016), nationwide, Black "children are more likely than white children to be reported to child protective services (CPS) as possible victims of abuse or neglect, more likely to be investigated, and more likely to be removed from their families and placed in foster care. African American families are less likely to receive in-home services or to be reunified than are white families."[33] Findings from the Michigan Race Equity Coalition indicate that this "implicit bias or systemic bias results in fewer and lower quality services for African American families … (and can discourage) African American parents from seeking help because they are afraid of how they and their children might be treated."[33] The Commission to End Child Abuse and Neglect Fatalities (2016) also noted that, nationwide, Black children "die from child abuse or neglect at a rate that is two-and-a-half times greater than that of white or Hispanic children."[33]

Of the 118 children whose child abuse-related deaths were reviewed by local CDR teams, 15% were known to have had a prior disability or chronic illness. Of the children known to have had a prior disability or chronic illness, 39% had a physical or orthopedic disability and 11% had a cognitive or intellectual disability. Half (50%) of the children had more than one type of disability or chronic illness.

Chart 45. Child Abuse Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)



Child Neglect Deaths Reviewed by Local CDR Teams

According to the Commission to End Child Abuse and Neglect Fatalities (2016), nationwide, "approximately 72 percent of child maltreatment fatalities involve neglect, either alone or in combination with another type of maltreatment and often in families challenged by the stresses of poverty."[33]

Local CDR teams believed child neglect caused or contributed to 95 out of the 213 (45%) total deaths reviewed. The most common types of child neglect identified by local CDR teams were failure to seek or follow treatment (33%) and exposure to hazards (31%), followed by failure to provide necessities (16%), failure to provide supervision (13%), and emotional neglect and abandonment (7%).

Local CDR teams are asked to identify up to two individuals who caused or contributed to the child's death. At least one perpetrator was identified for 96% of the children whose child neglect-related deaths were reviewed. When known, the perpetrator(s) of the abuse was most likely to be the child's biological mother (66% of child neglect deaths reviewed) and/or the child's biological father (22% of deaths reviewed). Other known types of perpetrators included other types of people, such as the child's mother's or father's partner, a legal guardian, or a family friend (7%) and the child's relative, such as a grandparent, stepparent, or other relative (5%).

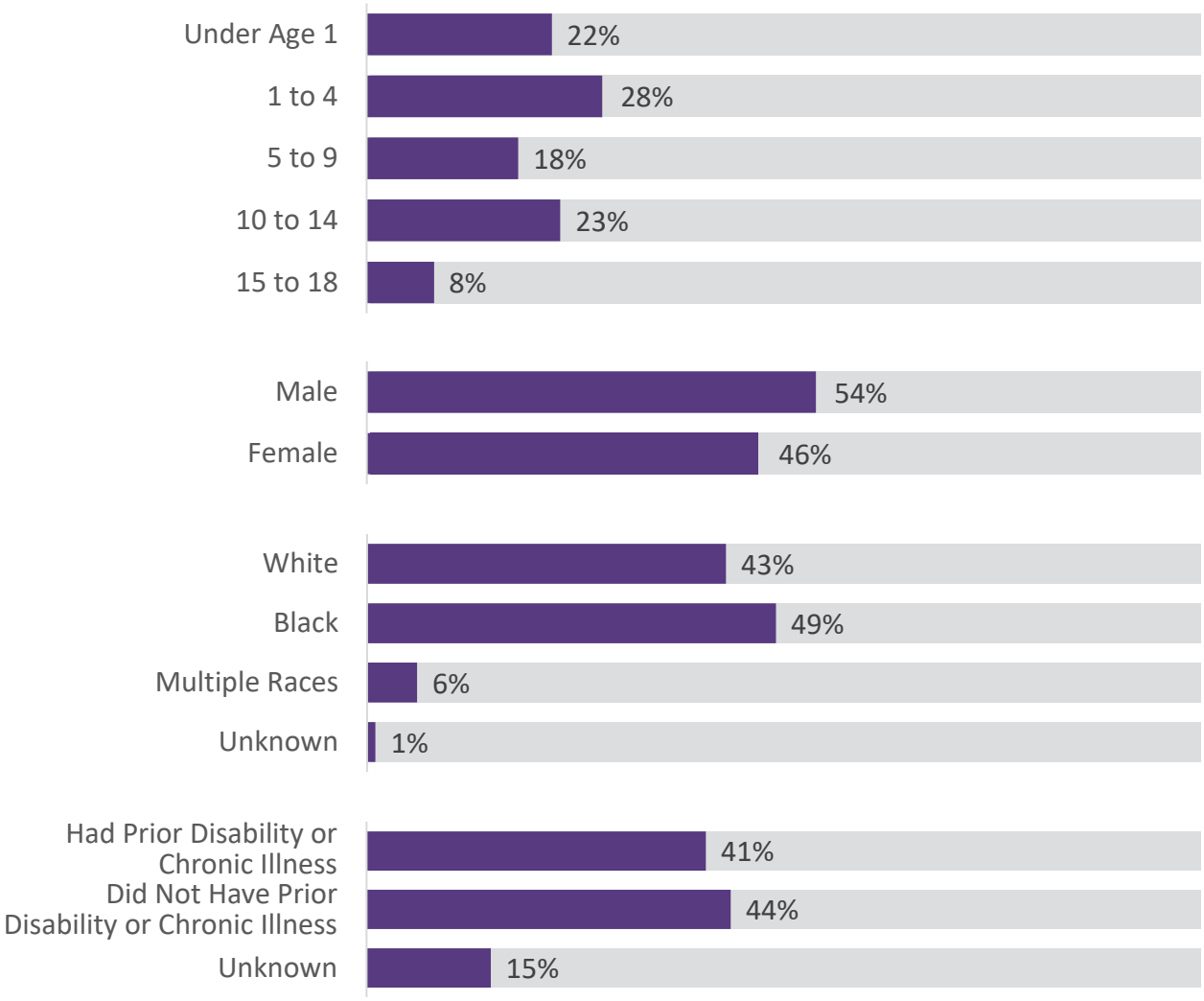
Of the deaths reviewed by local CDR teams where child neglect caused or contributed to the death, half (50%) were of children ages four and younger. An additional 23% of deaths reviewed were of children ages 10 to 14 years old and 18% were of children ages 5 to 9 years old. The deaths of adolescents ages 15 to 18 years old accounted for the smallest percentage of deaths reviewed (8%). Local CDR teams were slightly more likely to review the deaths of male children than female children (54% and 46%, respectively).

The child neglect-related deaths of Black children were most likely to be reviewed by local CDR teams (49%), followed by white children (43%) and children of multiple races (6%). According to the Commission to End Child Abuse and Neglect Fatalities (2016), nationwide, Black "children are more likely than white children to be reported to child protective services (CPS) as possible victims of abuse or neglect, more likely to be investigated, and more likely to be removed from their families and placed in foster care. African American families are less likely to receive in-home services or to be reunified than are white families."[33] Findings from the Michigan Race Equity Coalition indicate that this "implicit bias or systemic bias results in fewer and lower quality services for African American families … (and can discourage) African American parents from seeking help because they are afraid of how they and their children might be treated."[33]

The Commission to End Child Abuse and Neglect Fatalities (2016) also noted that, nationwide, Black children "die from child abuse or neglect at a rate that is two-and-a-half times greater than that of white or Hispanic children."[33]

Of the 95 children whose child neglect-related deaths were reviewed by local CDR teams, 41% were known to have had a prior disability or chronic illness. Of the children known to have had a prior disability or chronic illness, 56% had a physical or orthopedic disability, 10% had a cognitive or intellectual disability, and 8% had a mental health or substance use disorder. Over one-quarter (26%) of the children had more than one type of disability or chronic illness.

Chart 46. Child Neglect Deaths Reviewed by Local CDR Teams by Child's Demographics (2015-2019)



Opportunities for Prevention

Child abuse and child neglect are common, but preventable, and everyone benefits when children have safe, stable, nurturing relationships and environments. According to the Centers for Disease Control and Prevention (URL: https://bit.ly/3MvnWqQ), strengthening protective factors for families and communities reduces the risk of child abuse and child neglect. These supports may include:

- Increasing economic supports for families, including family-friendly work policies (URL: https://bit.ly/3vnhBrP) and ensuring access to safe, affordable housing.
- Changing social norms to support parents (URL: https://bit.ly/3LhDuOq) and positive parenting (URL: https://bit.ly/3OAmh53).
- Engaging fathers and supporting fatherhood programs (URL: https://bit.ly/3ve5U6D).
- Providing quality care and education early in life (URL: https://bit.ly/3Le9mUc), including access to state-funded (URL: https://bit.ly/3xOaMkw) and federally-funded (URL: https://bit.ly/3vFkC5z) preschool programs, enhanced licensing and accreditation standards, and improving educational opportunities for providers (URL: https://bit.ly/3ENOH6V).
- Enhancing parenting skills to promote healthy child development and increasing access to early childhood home visiting programs (URL: https://mihomevisiting.com/).
- Providing support and high-quality care to families affected by mental health or substance use disorders (URL: https://bit.ly/3LeqnNX).
- Ensuring access to services for families affected by domestic violence (URL: https://bit.ly/3vacvyS).

Recommendations to Policymakers to Prevent Deaths Due to Child Abuse and Child Neglect

Many members of the Child Death State Advisory Team also volunteer as members of Michigan's Citizen Review Panel (CRP) on Child Fatalities. The Federal Government mandated the formation of CRPs in 1999 to ensure states meet the goals of protecting children from child abuse and child neglect through the evaluation of the strengths, weaknesses, and challenges in the child welfare delivery system. The CRP on Child Fatalities identifies children's deaths for review in collaboration with MDHHS and compiles findings and recommendations from the review process in the hopes of improving the child welfare system in Michigan.

The members of the Child Death State Advisory Team and the CRP on Child Fatalities offer the following recommendations to policymakers to prevent deaths due to child abuse and child neglect:

- Offer standardized training for mandated reporters that highlights the fact that the reporting source is protected under statute and will be kept confidential, including the specifics of the allegations, to increase the comfort level of potential mandated reporters, which may in turn increase appropriate reporting.
- In CPS cases where a child is referred for a medical evaluation, require that direct communication occur between the CPS worker and the medical staff completing the evaluation to ensure that workers obtain a full understanding of the findings of that evaluation.
- Ensure that training for child welfare staff includes information about Adverse Childhood Experiences (ACEs), trauma-informed care, and protective factors, including how they impact which services may be most effective for each family.

Local Initiatives to Prevent Deaths Due to Child Abuse and Child Neglect

Several CDR teams have implemented initiatives in their local communities to prevent deaths due to child abuse and child neglect, including:

- Local CDR team member discussions that led to improvements in investigative protocols and inter-agency collaboration.

Firearm-Related Homicides

According to the Children's Safety Network, firearm-related homicide is the second leading cause of fatal injuries for children ages 0 to 19 in the United States, with approximately five children dying as a result each day. Firearm-related homicide rates increased 5.8%, on average, each year between 2013 and 2019.[37] According to the American Academy of Pediatrics, the risk of a child dying by homicide is three times higher when guns are present in the home, and an estimated 4.6 million children nationwide live in homes with unlocked and loaded guns.[38]

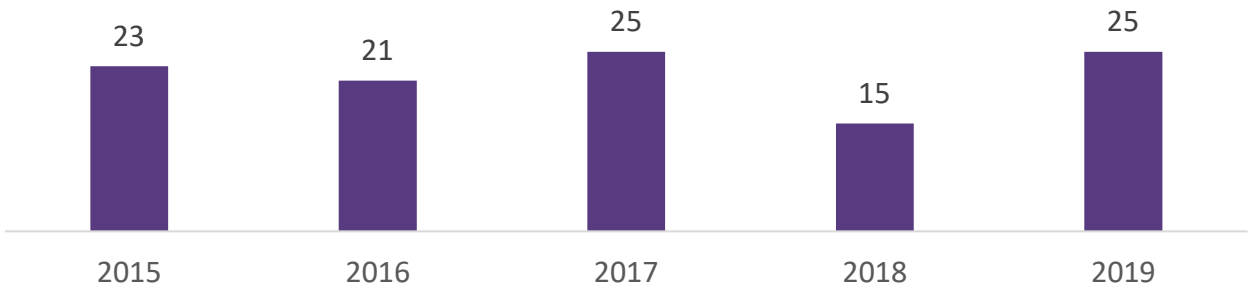
In Michigan, from 2015 to 2019, homicide was the fourth leading cause of fatal injury for children ages 0 to 18 years old, accounting for 16% of all fatal injuries. Firearm-related homicides were the most common type of homicide, accounting for more than half (52%) of the homicides and 8% of all fatal injuries to children ages 0 to 18 years old.[1] Within this five-year period, children ages 0 through 18 died due to firearm-related homicide at an average rate of 1.4 deaths per 100,000 children. Adolescents ages 15 to 18 years old were the most likely age group to die due to firearm-related homicide (an average rate of 4.7 deaths per 100,000 children).[1] Children ages four and younger died at an average rate of 0.6 deaths per 100,000 children and children ages 5 to 14 years old died at an average rate of 0.4 deaths per 100,000 children.[1,12]

Firearm-related suicides are discussed in further detail on pages 108-111.

Firearm-Related Homicides Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 109 children who died due to firearm-related homicide. The number varied by year, ranging from 25 deaths reviewed in both 2017 and 2019 to 15 deaths reviewed in 2018.

Chart 47. Firearm-Related Homicides Reviewed by Local CDR Teams by Year of Review (2015-2019)

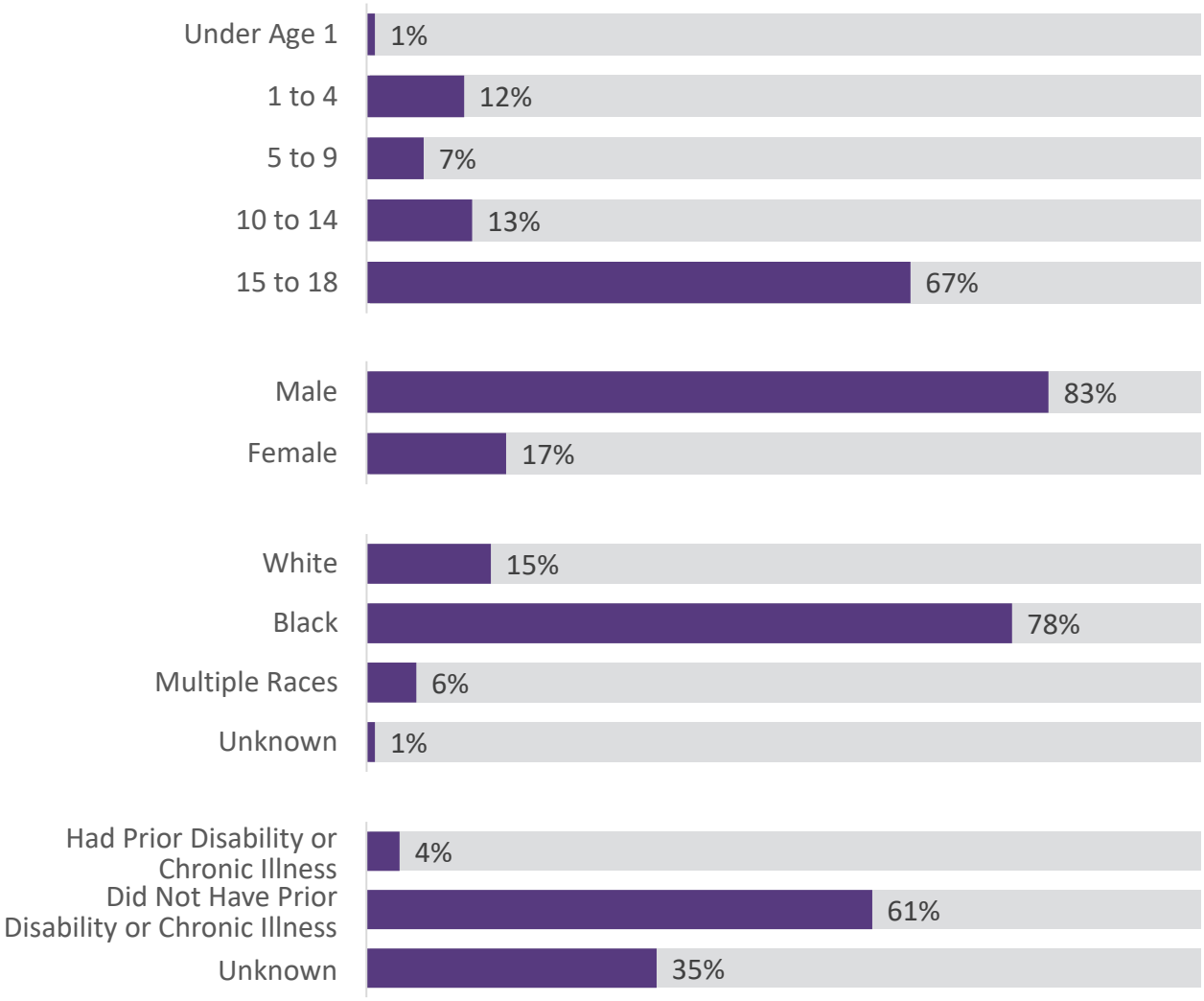


Of the deaths due to firearm-related homicide reviewed by local CDR teams from 2015 to 2019, over two-thirds (67%) were of adolescents ages 15 to 18 years old. The majority (83%) of the deaths reviewed by local CDR teams were of male children. According to the Children's Safety Network, in the United States, male children die due to firearm-related homicide at a higher rate than female children. For children ages 0 to 9 years old, this rate is 0.3 deaths per 100,000 children for females and 0.4 deaths per 100,000 children for males. The disparity increases significantly for children ages 10 to 19 years old, with 1.2 firearm-related homicides per 100,000 children for females and 7.2 deaths per 100,000 children for males.[37]

The majority (78%) of the deaths due to firearm-related homicide reviewed by Michigan's local CDR teams from 2015 to 2019 were of Black children. An additional 15% of the deaths reviewed were of white children and 6% were of children from additional groups, including children who were Asian or Pacific Islander or children of multiple races. Nationwide, Black children die due to firearm-related homicide at the highest rate (9.6 deaths per 100,000 children), followed by American Indian and Alaska Native children (2.1 deaths per 100,000 children), Hispanic children (1.8 deaths per 100,000 children), white children (0.7 deaths per 100,000 children), and Asian or Pacific Islander children (0.6 deaths per 100,000 children).[37]

Of the children whose deaths due to firearm-related homicide were reviewed by a local CDR team from 2015 to 2019, 4% were known to have had a prior disability or chronic illness.

Chart 48. Firearm-Related Homicides Reviewed by Local CDR Teams by Child's Demographics (2015-2019)

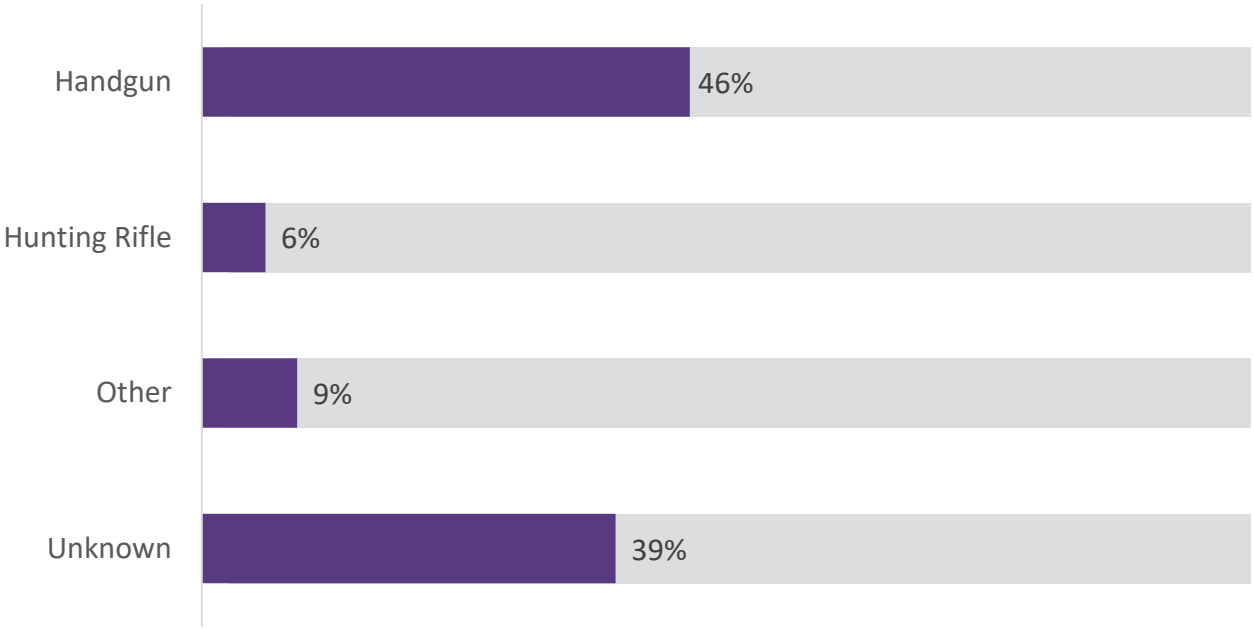


Note: *Additional groups includes Asian or Pacific Islander children and children of multiple races.*

Characteristics of the Firearm

A handgun was the most frequently identified (46%) type of firearm associated with the 109 children's deaths reviewed by local CDR teams from 2015 to 2019. The type of firearm was not known for 39% of the deaths reviewed.

Chart 49. Firearm-Related Homicides Reviewed by Local CDR Teams by Type of Firearm (2015-2019)



Note: *Other includes types of firearms such as shotguns, assault rifles, rifles, and antique revolvers.*

The local CDR team did not know how the firearm was stored for 84% of the children's deaths reviewed. For the 17 deaths reviewed when the local CDR team did know how the firearm was stored, the firearm was not stored or was not stored properly for all 17 deaths.

The owner of the firearm was most likely to be the child's relative, stepparent, friend, or parent's partner (20% of deaths reviewed) followed by a stranger (10% of deaths reviewed). The local CDR team did not know who the owner of the firearm was for 60% of the children's deaths reviewed.

Opportunities for Prevention

Parents, caregivers, and community partners can keep children safe from firearms by:

- Keeping firearms out of the home or learning about the safest way to store a firearm (URL: https://bit.ly/3xZl9lo), including about safe storage options for firearms in vehicles (URL: https://bit.ly/3vdtWyv).
- Asking about the presence of guns in homes (URL: https://bit.ly/3LestNP) children visit.
- Obtaining free gun safety kits and trigger locks through Project ChildSafe (URL: https://bit.ly/3rQfHxw).
- Storing firearms unloaded and locked (URL: https://bit.ly/3xOsMLt) in a cabinet, safe, gun vault, or storage case. Consider using a gun lock.
- Locking the bullets in a place separate from the firearm.
- Ensuring the keys or passcode are hidden or not accessible.
- Talking to children about firearms (URL: https://bit.ly/3vdCaGN), even if guns are not kept in the child's home, and teaching them that they are not toys and are very dangerous.
- Ensuring safety (URL: https://bit.ly/37D62nh) is part of every conversation about hunting and firearm use (URL: https://bit.ly/3xRk7I9).
- Raising awareness of Okay2Say (URL: https://bit.ly/3xXiSYh), where anyone can report tips confidentially 24/7 on criminal activities or potential harm directed at students, school employees, or schools.
- Engaging with programs that empower youth (URL: https://bit.ly/3rPraNZ) and communities.
- Investing in community-based gun violence prevention programs (URL: https://bit.ly/3kaCqjD).

Recommendations to Policymakers to Prevent Firearm-Related Homicides

The Child Death State Advisory Team offers the following recommendations to policymakers to prevent firearm-related homicides:

- Enact a public education campaign with an emphasis on the fact that gun safety and Second Amendment rights are not mutually exclusive issues.
- When a child is identified as having mental health diagnoses, encourage clinicians to ask parents about their access to guns in the home.

Suicides

Of all the types of child death highlighted in this report, one category stands apart - those in which the child had a deliberate hand in their own death.

In this report, and recommended by the Michigan Suicide Prevention Commission, the term "died by suicide" will be used as "the word 'commit' has been found to be inaccurate and stigmatizing as 'commit' is connected to a criminal act, which is often viewed as an extension of a character defect. Using the term 'commit' can deter (people) from seeking the help they need." This shift in language can decrease stigma and make the conversation about suicide safer.[39]

Suicide is preventable and help is available. If you or someone you know needs immediate support, please contact the following resources for confidential, 24/7 assistance:

- National Suicide Prevention Lifeline (URL: https://bit.ly/3Ml6xRw): Call or text 1-800-273-8255, or chat online (URL: https://bit.ly/3xW4oHU) with a trained crisis counselor.
- Crisis Text Line (URL: https://bit.ly/3K8pGoc): Text HOME to 741741.
- The Trevor Project (URL: https://bit.ly/38m2F3L) for LGBTQ young people: 1-866-488-7386 or text START to 678678.
- Call 911 for immediate help.

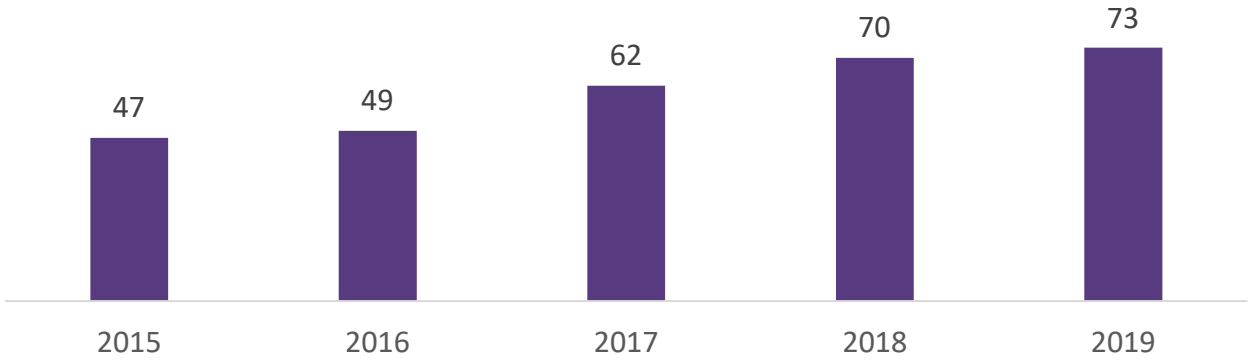
According to the Children's Safety Network, suicide is the second leading cause of death for children ages 10 through 19 in the United States.[40] From 2016 to 2019, the national average rate of death due to suicide was 6.8 deaths per 100,000 children ages 10 through 19 years old. During this same time period, the rate in Michigan was above the national average at 8.1 deaths per 100,000 children ages 10 through 19 years old. Nationwide, the rate of death due to suicide for children ages 10 through 19 years old "has increased dramatically from 4.5 deaths per 100,000 in 2010 to 6.6 in 2019. This increasing trend is statistically significant, representing on average about 5.3 percent change annually."[41]

In Michigan, from 2015 to 2019, suicide was the third leading cause of fatal injury for children ages 0 to 18 years old. Children who died by suicide accounted for 20% of all fatal injuries to children ages 0 to 18 years old.[1] Within this five-year period, children ages 10 through 18 years old died at an average rate of 6.8 deaths per 100,000 children. Children ages 10 to 14 years old died at an average rate of 3.1 deaths per 100,000 children and adolescents ages 15 to 18 years old died at an average rate of 11.1 deaths per 100,000 children.[1,12]

Suicides Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 301 children who died by suicide. The number of deaths reviewed increased each year, ranging from 47 deaths reviewed in 2015 to 73 deaths reviewed in 2019.

Chart 50. Suicides Reviewed by Local CDR Teams by Year of Review (2015-2019)



Of the children who died by suicide whose deaths were reviewed by a local CDR team from 2015 to 2019, 70% were adolescents ages 15 to 18 years old and 29% were children ages 10 to 14 years old.

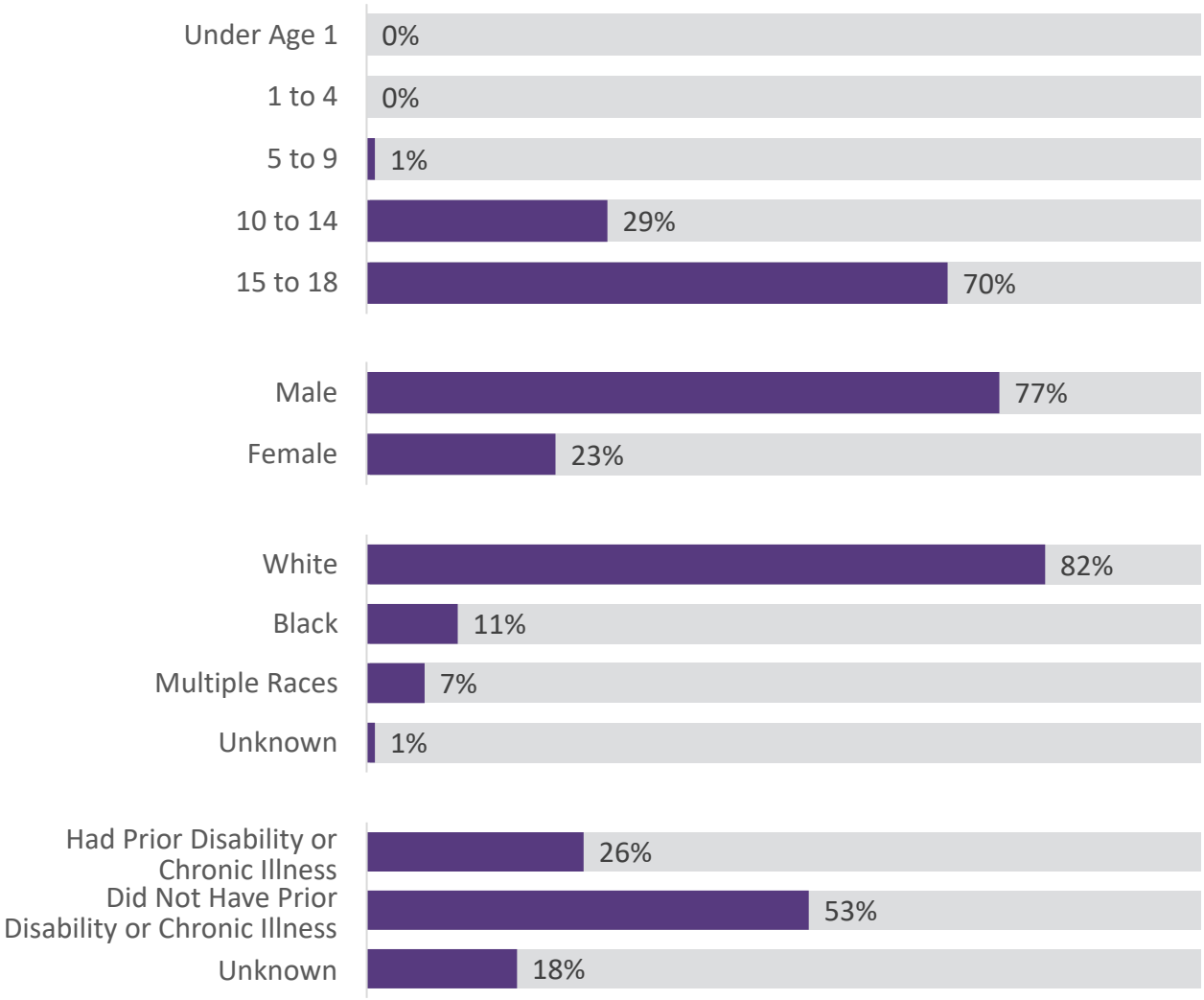
More than three-quarters (77%) of the deaths reviewed by local CDR teams were of male children. According to the Michigan Suicide Prevention Commission, in 2018, male children ages 10 to 19 years old in Michigan were more likely to die by suicide than female children (13.8 deaths per 100,000 population and 3.5 deaths per 100,000 population, respectively).[39]

The majority (82%) of the deaths of children who died by suicide reviewed by Michigan's local CDR teams from 2015 to 2019 were of white children. An additional 11% of the deaths reviewed were of Black children and 7% were of children from additional groups, including children who were Asian or Pacific Islander or children of multiple races. Nationwide, from 2017 to 2019, the suicide rate was "highest for American Indian/Alaska Native (AI/AN) adolescents at nearly 2.5 times the rate for white adolescents" ages 10 to 19 years old (22.4 deaths per 100,000 and 8.3 deaths per 100,000, respectively).[41] The rate of death due to suicide was 5.4 deaths per 100,000 for Asian/Pacific Islander children and 5.0 deaths per 100,000 for Black children.[41]

Of the children whose deaths due to suicide were reviewed by a local CDR team from 2015 to 2019, 29% were known to have had a prior disability or chronic illness. Of the children who were known to have had a prior disability or chronic illness, 75% had a mental health or substance use disorder, 11% had a cognitive or intellectual disability, and 5% had a physical or orthopedic disability. Some children (9%) had more than one type of disability or chronic illness.

According to the Michigan Suicide Prevention Commission, "most physical health conditions are associated with increased risk of suicide," "people with multiple chronic conditions have greater risk for suicide," and "approximately half of people have a mental health diagnosis before they die by suicide."[39] According to the Suicide Prevention Resource Center, the impact of mental health or substance use disorders "as risk factors for suicide can be reduced by access to effective treatments and strengthened social support in an understanding community."[42]

Chart 51. Suicides Reviewed by Local CDR Teams by Child's Demographics (2015-2019)



Note: *Additional groups includes Asian or Pacific Islander children and children of multiple races.*

Mental Health Services Received

Of the 301 children who died by suicide whose deaths were reviewed by a local CDR team:

- 41% were known to have received prior mental health services of any kind, including outpatient, day treatment/partial hospitalization, and residential services.
- 27% were known to be receiving mental health services of any kind, including outpatient, day treatment/partial hospitalization, and residential services, at the time of their death.
- 27% were known to have had an active prescription for medications for mental health illness at the time of their death.

Warning Signs of Suicide

Warning signs of suicide for youth up to the age of 24 may be different than warning signs for adults.[43] In youth, warning signs of suicide include:

- Talking about or making plans for suicide.
- Expressing hopelessness about the future.
- Displaying severe/overwhelming emotional pain or distress.
- Showing worrisome behavioral cues or marked changes in behavior, particularly in the presence of the warning signs above. Specifically, this includes significant:
    - □ Withdrawal from or changing in social connections/situations.
    - □ Changes in sleep (increased or decreased).
    - □ Anger or hostility that seems out of character or out of context.
    - □ Recent increased agitation or irritability.

Of the 301 children who died by suicide whose deaths were reviewed by a local CDR team, 58% were known to have ever communicated any suicidal thoughts, actions, or intent to another individual, exhibited behaviors indicating that they planned or premeditated their own death, and/or exhibited warning signs for suicide within 30 days of their death. Of these 176 children:

- 48% were known to have received prior mental health services of any kind, including outpatient, day treatment/partial hospitalization, and residential services.
- 31% were known to be receiving mental health services of any kind, including outpatient, day treatment/partial hospitalization, and residential services, at the time of their death.
- 32% were known to have had an active prescription for medications for mental health illness at the time of their death.

Mechanism of Injury

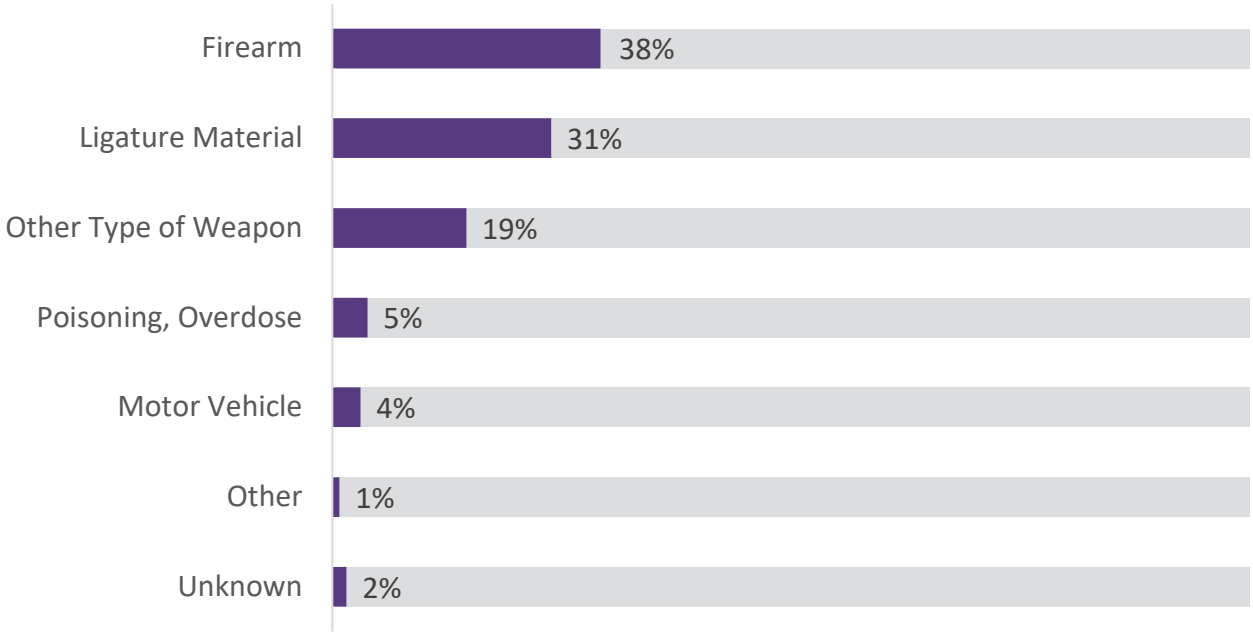
Nationwide, from 2017 to 2019, "slightly more than 93% of all adolescent suicides are attributable to three means—suffocation (43.7%), firearms (42.9%), and poisoning (6.7%)."[41] According to the Children's Safety Network, "from 2010 to 2019, the suicide death rate by firearms increased 56% among adolescents in the U.S. The growth is about 6.3% per year on average. The rates have increased by approximately 27% for suffocation and doubled for drug poisoning. For suffocation, the growth rate is about 4.1% per year on average, and for drug poisoning it is about 8.0% per year on average."[41]

In Michigan, the mechanism of fatal injury for all children who died by suicide from 2015 to 2019 was most likely to be hanging/suffocation (50% of all children's deaths by suicide), followed by firearm (38%), poison (6%), and other means (5%).[1]

The mechanism of fatal injury for the 301 children who died by suicide whose deaths were reviewed by a local CDR team was most likely to be a firearm (38% of deaths reviewed) or a type of ligature material, such as a rope, cord, belt, or strap (31% of deaths reviewed).

Firearm-related suicides are discussed in further detail on pages 108-111.

Chart 52. Suicides Reviewed by Local CDR Teams by Mechanism of Injury (2015-2019)



Firearm-Related Suicide

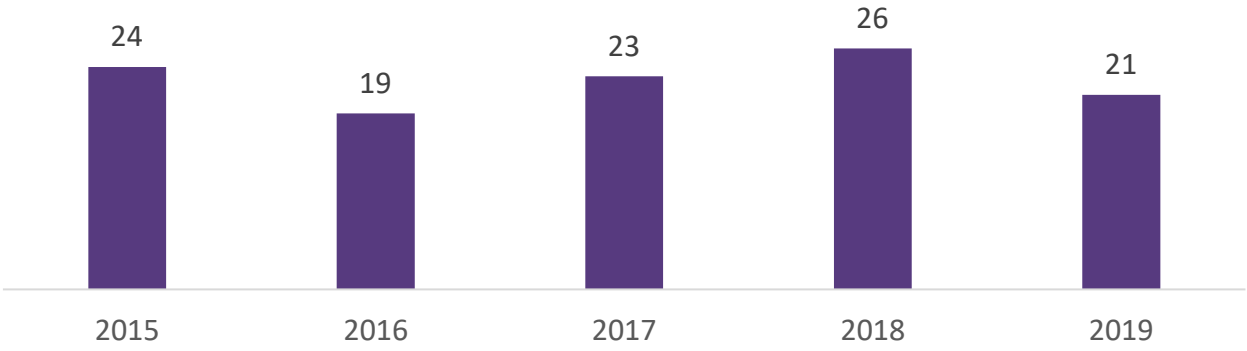
Nationwide, firearm-related suicides were the fourth leading cause of injury death for children ages 10 to 19 years old from 2016 to 2019.[44] According to the American Academy of Pediatrics, the rate of suicide for children who live in homes with firearms is four times higher than it is for children who live in homes without firearms. In nine out of ten firearm-related youth suicides, the child accessed the firearm in their own home or in the home of a relative.[38]

In Michigan, from 2015 to 2019, children who died by firearm-related suicide accounted for 8% of all fatal injuries to children ages 0 to 18 years old.[1] Within this five-year period, children ages 10 through 18 years old died at an average rate of 2.6 deaths per 100,000 children. Children ages 10 to 14 years old died at an average rate of 0.9 deaths per 100,000 children and adolescents ages 15 to 18 years old died at an average rate of 4.6 deaths per 100,000 children.[1,12]

Firearm-Related Suicides Reviewed by Local CDR Teams

From 2015 to 2019, local CDR teams reviewed the deaths of 113 children who died by firearm-related suicide. The number varied by year, ranging from 26 deaths reviewed in 2018 to 19 deaths reviewed in 2016.

Chart 53. Firearm-Related Suicides Reviewed by Local CDR Teams by Year of Review (2015-2019)

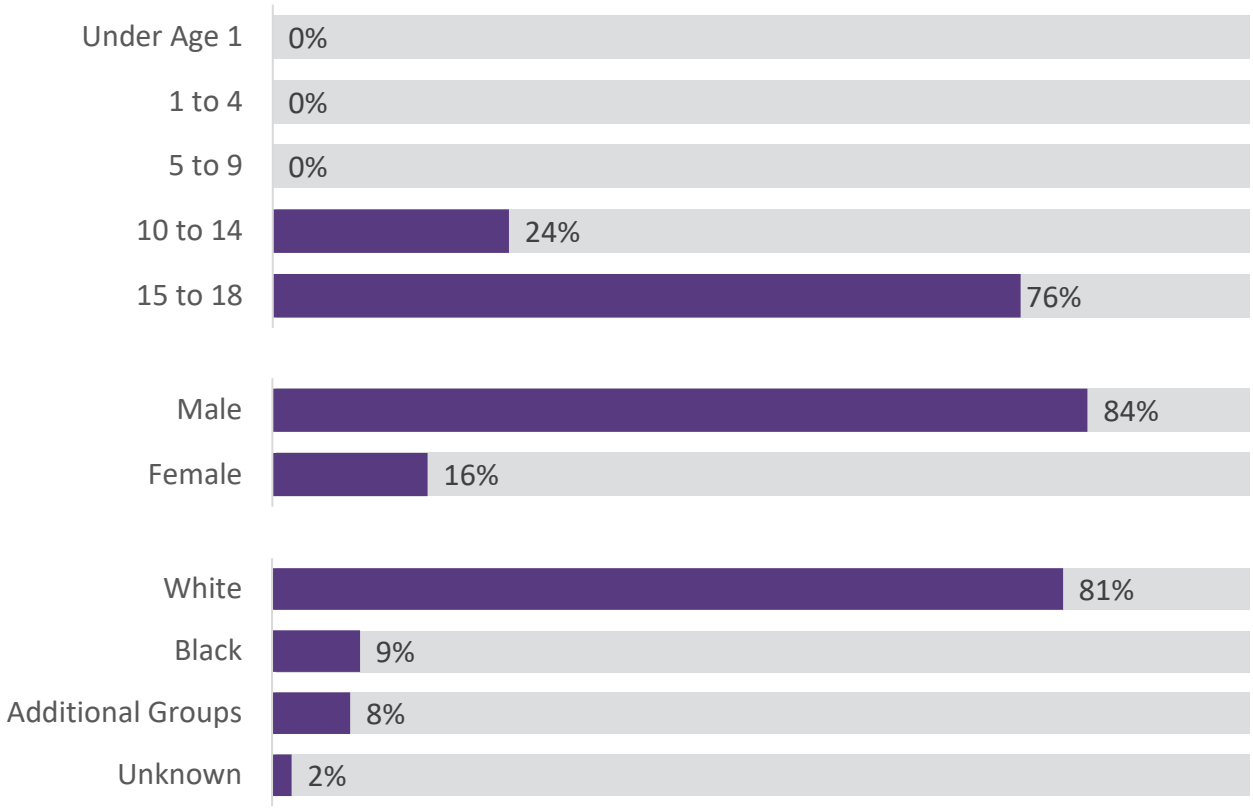


Of the children who died by firearm-related suicide whose deaths were reviewed by a local CDR team from 2015 to 2019, 76% were adolescents ages 15 to 18 years old and 24% were children ages 10 to 14 years old.

More than four out of five (84%) of the deaths reviewed by local CDR teams were of male children. Nationwide, from 2016 to 2019, male children died at a higher rate due to firearm-related suicide than female children ages 10 to 19 years old (4.9 deaths and 0.8 deaths per 100,000 children by sex, respectively).[44]

The majority (81%) of the deaths of children who died by firearm-related suicide reviewed by Michigan's local CDR teams from 2015 to 2019 were of white children. An additional 9% of the deaths reviewed were of Black children and 8% were of children from additional groups, including children who were Asian or Pacific Islander or children of multiple races. Nationwide, from 2016 to 2019, American Indian/Alaska Native children ages 10 to 19 years old had the highest rate of death due to firearm-related suicide (6.0 deaths per 100,000 children by race), followed by white children (3.9 deaths per 100,000 children by race), Black children (2.0 deaths per 100,000 children by race), and Asian or Pacific Islander children (1.4 deaths per 100,000 children by race).[44]

Chart 54. Firearm-Related Suicides Reviewed by Local CDR Teams by Child's Demographics (2015-2019)

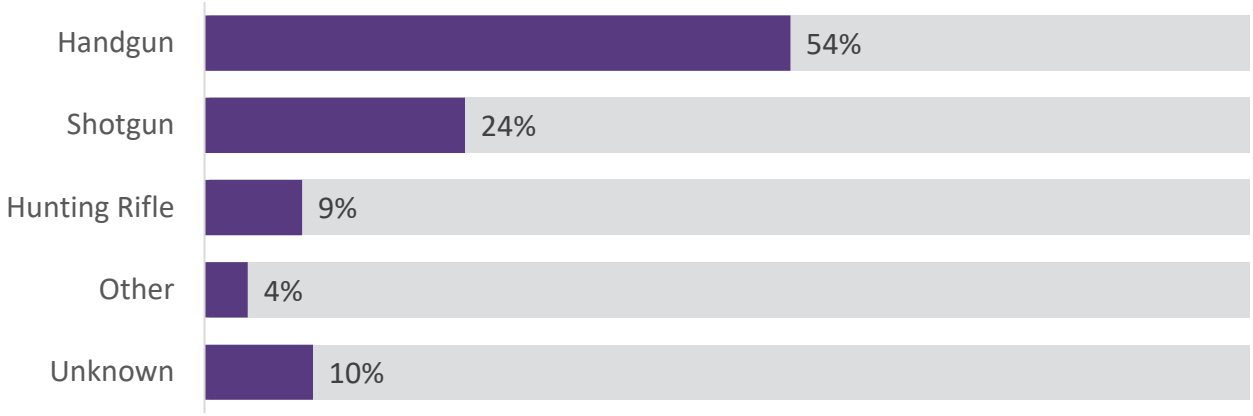


Note: *Additional groups includes Asian or Pacific Islander children and children of multiple races.*

Characteristics of the Firearm

Of the children who died by firearm-related suicide whose deaths were reviewed by a local CDR team from 2015 to 2019, the type of firearm was most likely to be a handgun (54%), followed by a shotgun (24%), and a hunting rifle (9%).

Chart 55. Firearm-Related Suicides Reviewed by Local CDR Teams by Type of Firearm (2015-2019)



Note: *Other includes types of firearms such as assault rifles, rifles, and modified pellet guns.*

The local CDR team identified that the firearm was not stored or was not stored properly in 46% of the firearm-related deaths by suicide reviewed by local CDR teams. The firearm was properly stored only 15% of the time. The local CDR team did not know how the firearm was stored for 39% of the children's deaths reviewed.

The owner of the firearm was most likely to be the child's relative or friend (67% of deaths reviewed), followed by the child (10% of deaths reviewed) and another type of individual (4% of deaths reviewed). The local CDR team did not know who the owner of the firearm was for 20% of the children's deaths reviewed.

Opportunities for Prevention

Everyone can play a part in preventing suicide. According to #BeThe1To (URL: https://bit.ly/3LhO1t0), there are 5 action steps for communicating with someone who may be suicidal:

- **ASK.** Asking the question "Are you thinking about suicide?" communicates that you're open to speaking about suicide in a non-judgmental and supportive way. Asking in this direct, unbiased manner can open the door for effective dialogue and can reduce suicidal ideation. Learn how to have a conversation (URL: https://bit.ly/3KeKwCg) about mental health.
- **BE THERE.** Being there for someone with thoughts of suicide is life-saving. Increasing someone's connectedness to others and limiting their isolation (both in the short-term and long-term) has shown to be a protective factor against suicide.
- **KEEP THEM SAFE.** Establish immediate safety and eliminate access to lethal means, including firearms (URL: https://bit.ly/3vLmb1E).
- **HELP THEM CONNECT.** Help them connect with ongoing supports and establish a safety net. If you're worried about a child, take it seriously and talk to them right away. You also can turn to these resources for 24/7, confidential help:
  - National Suicide Prevention Lifeline (URL: https://bit.ly/3Ml6xRw): Call or text 1-800-273-8255, or chat online (URL: https://bit.ly/3xW4oHU) with a trained crisis counselor
  - Crisis Text Line (URL: https://bit.ly/3K8pGoc): Text HOME to 741741
  - The Trevor Project (URL: https://bit.ly/38m2F3L) for LGBTQ young people: 1-866-488-7386 or text START to 678678
  - Call 911 for immediate help
- **FOLLOW-UP.** Make sure to follow-up with them to see how they're doing. Leave a message, send a text, or give them a call.

Recommendations to Policymakers to Prevent Youth Suicide

The Child Death State Advisory Team offers the following recommendations to policymakers to prevent youth suicide:

- Consider statewide roll-out of the suicidality/lethality assessment developed for children ages 10 and older entering foster care and intended for use in Emergency Departments that was piloted by the Transitioning Youth Suicide Prevention workgroup in Washtenaw County through a Garrett Lee Smith grant-funded partnership between the Michigan Department of Health and Human Services and the University of Michigan.
- Ensure that local resources that provide mental health support are compiled and distributed widely throughout the community.
- Increase resources and support to Community Mental Health to provide additional services to youth throughout Michigan.

References

1 Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics. (2021). *2015-2019 Michigan resident death files* [Data set].

2 Centers for Disease Control and Prevention, National Center for Health Statistics. (2021). *Underlying Cause of Death, 1999-2020* [Data set]. http://wonder.cdc.gov/ucd-icd10.html

3 Hanzlick, R., Hunsaker III, J. C., & Davis, G. J. (2002). *A guide for manner of death classification*. National Association of Medical Examiners. https://name.memberclicks.net/assets/docs/MANNEROFDEATH.pdf

4 American Medical Association and Association of American Medical Colleges. (2021). *Advancing health equity: Guide on language, narrative and concepts.* https://www.ama-assn.org/system/files/ama-aamc-equity-guide.pdf

5 Child Trends. (2019). *Infant, child, and teen mortality*. Retrieved from https://www.childtrends.org/indicators/infant-child-and-teen-mortality

6 Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics. (2021). *Number and rate of infant deaths by race, Michigan and United States residents, 1989-2020* [Table]. https://www.mdch.state.mi.us/osr/InDxMain/INFDX.ASP

7 Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics. (2022). *Summary of 2020 infant death statistics*. https://www.mdch.state.mi.us/osr/InDxMain/Infsum05.asp

8 Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics. (2021). *Number of infant deaths by cause of death, 2014-2020, Michigan residents; Dollfus primary cause of death group; Dollfus subcategory cause of death group* [Table]. https://www.mdch.state.mi.us/osr/InDxMain/Dollfus.asp

9 Shapiro-Mendoza, C.K., Palusci, V.J., Hoffman, B., Batara, E., Yester, M., Corey, T.S., Sens, M.A., AAP TASK FORCE ON SUDDEN INFANT DEATH SYNDROME, COUNCIL ON CHILD ABUSE AND NEGLECT, COUNCIL ON INJURY, VIOLENCE, AND POISON PREVENTION, SECTION ON CHILD DEATH REVIEW AND PREVENTION, & NATIONAL ASSOCIATION OF MEDICAL EXAMINERS. (2021). Half century since SIDS: A reappraisal of terminology. *Pediatrics, 148*(4):e2021053746. https://doi.org/10.1542/peds.2021-053746

10 Vyas, D.A., Eisenstein, L.G., & Jones, D.S. (2020). Hidden in plain sight - Reconsidering the use of race correction in clinical algorithms. *The New England Journal of Medicine*, 383, 874-882. https://doi.org/10.1056/NEJMms2004740

11 Pratt, E., & Hahn, H. (2021). *What happens when people face unfair treatment or judgment when applying for public assistance or social services?* Urban Institute. https://www.urban.org/sites/default/files/publication/104566/what-happens-when-people-face-unfair-treatment-or-judgment-when-applying-for-public-assistance-or-social-services_0.pdf

12 Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics. (2022). Population by race and age group 0-18, 2015-2020 [Data set].

13 Office of Developmental Primary Care. (2018). *Medical and social models of disability*. https://odpc.ucsf.edu/clinical/patient-centered-care/medical-and-social-models-of-disability#pdf

14 Yee, S., Breslin, M.L., Goode, T.D., Havercamp, S.M., Horner-Johnson, W., Iezzoni, L.I., & Krahn, G. (2018). Compounded disparities: Health equity at the intersection of disability, race, and ethnicity. Hoang, H., Horowitz, A.M., Parnell, T.A., & Villaire, M (Eds.), *People Living with Disabilities: Health Equity, Health Disparities, and Health Literacy: Proceedings of a Workshop* (pp. 4-22). The National Academies Press. https://doi.org/10.17226/24741

15 Young, N.A.E. (2021). *Childhood disability in the United States: 2019*. American Community Survey Briefs, U.S. Census Bureau. https://www.census.gov/content/dam/Census/library/publications/2021/acs/acsbr-006.pdf

16 Erickson, W., Lee, C., & von Schrader, S. (2020). *2018 disability status report: United States*. Ithaca, NY: Cornell University Yang-Tan Institute on Employment and Disability (YTI). https://www.disabilitystatistics.org/StatusReports/2018-PDF/2018-StatusReport_US.pdf

17 Erickson, W., Lee, C., & von Schrader, S. (2020). *2018 disability status report: Michigan*. Ithaca, NY: Cornell University Yang-Tan Institute on Employment and Disability (YTI). https://www.disabilitystatistics.org/StatusReports/2018-PDF/2018-StatusReport_MI.pdf?CFID=56a5b1ca-018e-4a69-b2bd-20fe2301d9ca&CFTOKEN=0

18 Children's Safety Network. (2021). *Unintentional motor vehicle traffic fatalities*. https://www.childrenssafetynetwork.org/sites/default/files/DataMaps_CSN_MVTS.pdf

19 Children's Safety Network. (2022). *Teen driving safety 2022 resource guid*e. https://www.childrenssafetynetwork.org/sites/default/files/TeenDrivingSafetyGuide2022.pdf

20 Children's Safety Network. (n.d.). *Child passenger safety*. Retrieved February 27, 2022, from https://www.childrenssafetynetwork.org/child-safety-topics/child-passenger-safety

21 Safe Kids Worldwide. (n.d.). *Car seat safety tips*. Retrieved February 27, 2022, from https://www.safekids.org/car-seat

22 Denny, S.A., Quan, L, Gilchrist, J., McCallin, T., Shenoi, R., Yusuf, S., Hoffman, B., Weiss, J., & COUNCIL ON INJURY, VIOLENCE, AND POISON PREVENTION. (2019). Prevention of drowning. *Pediatrics, 143*(5), e20190850. https://doi.org/10.1542/peds.2019-0850

23 Centers for Disease Control and Prevention. (n.d.). *Drowning prevention*. Retrieved February 27, 2022, from https://www.cdc.gov/drowning/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhomeandrecreationalsafety%2Fwater-safety%2Findex.html

24 Centers for Disease Control and Prevention. (n.d.). *Drowning facts*. Retrieved February 27, 2022, from https://www.cdc.gov/drowning/facts/index.html

25 Clemens, T., Moreland, B., & Lee, R. (2021). Persistent racial/ethnic disparities in fatal unintentional drowning rates among persons aged ≤29 years – United States, 1999-2019. *Morbidity and Mortality Weekly Report*, 70(24), 869-874. http://dx.doi.org/10.15585/mmwr.mm7024a1

26 Children's Safety Network. (2021). *Fire and burn prevention 2021 resource guide*. https://www.childrenssafetynetwork.org/sites/default/files/FireBurnPrevention2021.pdf

27 U.S. Fire Administration, & Federal Emergency Management Agency. (2021). Fire risk in 2019. *Topical Fire Report Series*, 21(8). https://www.usfa.fema.gov/downloads/pdf/statistics/v21i8.pdf

28 Children's Safety Network. (2021). *Unintentional poisoning fatalities data*. https://www.childrenssafetynetwork.org/sites/default/files/DataMaps_CSN_PP.pdf

29 Children's Safety Network. (n.d.). *Injury disparities: Drug poisoning deaths*. Retrieved February 27, 2022, from https://www.childrenssafetynetwork.org/infographics/injury-disparities-drug-poisoning-deaths

30 Center for Disease Control and Prevention. (n.d.). *Injuries among children and teens*. Retrieved February 27, 2022, from https://www.cdc.gov/injury/features/child-injury/index.html

31 Center for Disease Control and Prevention. (n.d.). *Violence prevention fast facts*. Retrieved February 27, 2022, from https://www.cdc.gov/violenceprevention/childabuseandneglect/fastfact.html

32 Covington, T., & Collier, A. (2018). *Child maltreatment fatality reviews: Learning together to improve systems that protect children and prevent maltreatment*. National Center for Fatality Review and Prevention. https://www.ncfrp.org/wp-content/uploads/NCRPCD-Docs/CAN_Guidance.pdf

33 Commission to Eliminate Child Abuse and Neglect Fatalities. (2016). *Within our reach: A national strategy to eliminate child abuse and neglect fatalities*. Washington, DC: Government Printing Office. https://www.acf.hhs.gov/sites/default/files/documents/cb/cecanf_final_report.pdf

34 U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2017-2021). *Child Maltreatment 2015-2019*. Retrieved from https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment

35 Leeb, R.T., Paulozzi, L., Melanson, C., Simon, T., & Arias, I. (2008). *Child maltreatment surveillance: Uniform definitions for public health and recommended data elements*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. https://www.cdc.gov/violenceprevention/pdf/CM_Surveillance-a.pdf

36 Child Welfare Information Gateway. (2021). *Child abuse and neglect fatalities 2019: Statistics and interventions*. U.S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau. https://www.childwelfare.gov/pubPDFs/fatality.pdf

37 Children's Safety Network. (n.d.). Firearm safety: Preventing death by homicide. childrenssafetynetwork.org/sites/default/files/FirearmSafetyHomicidePrevention_Infographic.pdf

38 Schaechter, J. (2021). *Guns in the home*. Healthy Children, American Academy of Pediatrics. https://www.healthychildren.org/English/safety-prevention/at-home/Pages/Handguns-in-the-Home.aspx

39 Michigan Suicide Prevention Commission. (2021). *Michigan suicide prevention commission initial report*. Michigan Department of Health and Human Services. https://www.michigan.gov/documents/coronavirus/Suicide_Prevention_Commission_Initial_Report_Final_Draft_719896_7.pdf

40 Children's Safety Network. (2021). *Adolescent suicide deaths data*. https://www.childrenssafetynetwork.org/sites/default/files/DataMaps_CSN_SSHP.pdf

41 Children's Safety Now Alliance. (2021). *Suicide prevention fact sheet: Means of suicide*. Children's Safety Network. https://www.childrenssafetynetwork.org/sites/default/files/suicidemechanismsfactsheet_2021.pdf

42 Suicide Prevention Resource Center. (n.d.). *Safe and effective messaging for suicide prevention*. https://dpi.wi.gov/sites/default/files/imce/sspw/pdf/spsafemessage.pdf

43 Youth Suicide Warning Signs. (n.d.). *Healthcare professionals*. Retrieved February 27, 2022, from https://www.youthsuicidewarningsigns.org/healthcare-professionals

44 Children's Safety Network. (n.d.). *Firearm safety: Preventing death by suicide*. Retrieved February 27, 2022, from https://www.childrenssafetynetwork.org/infographics/firearm-safetypreventing-death-suicide

Appendix A. Total Number of Resident Child Deaths by Year and by County of Death

County	2015	2016	2017	2018	2019
Alcona	0	1	2	0	1
Alger	0	1	1	0	1
Allegan	19	12	11	13	17
Alpena	1	0	2	4	4
Antrim	2	1	1	1	0
Arenac	0	1	2	0	0
Baraga	1	1	2	1	0
Barry	3	6	7	3	7
Bay	15	4	13	8	6
Benzie	3	3	3	1	1
Berrien	22	21	19	27	18
Branch	7	8	10	10	5
Calhoun	25	16	20	19	9
Cass	8	7	8	9	5
Charlevoix	3	2	3	1	1
Cheboygan	3	2	4	5	4
Chippewa	1	1	1	5	4
Clare	2	3	3	7	1
Clinton	11	7	10	3	3
Crawford	2	4	1	2	1
Delta	2	4	2	4	4
Dickinson	2	3	4	5	1
Eaton	18	16	8	5	20
Emmet	1	5	2	4	1
Genesee	76	85	73	55	61
Gladwin	5	3	1	4	3

Appendix A. Total Number of Resident Child Deaths by Year and by County of Death *(Continued)*

County	2015	2016	2017	2018	2019
Gogebic	0	6	0	0	3
Grand Traverse	12	12	5	7	8
Gratiot	5	4	2	3	3
Hillsdale	6	8	9	4	12
Houghton	2	3	6	3	1
Huron	0	2	4	2	2
Ingham	32	41	25	32	35
Ionia	3	6	7	7	5
Iosco	1	1	5	5	4
Iron	0	0	2	2	2
Isabella	8	5	10	7	8
Jackson	23	30	22	16	14
Kalamazoo	34	28	55	26	29
Kalkaska	0	4	0	2	1
Kent	84	86	75	73	81
Keweenaw	0	0	1	0	1
Lake	1	0	2	1	3
Lapeer	5	6	6	6	14
Leelanau	3	2	1	1	0
Lenawee	14	12	10	6	7
Livingston	15	14	18	19	14
Luce	1	1	1	0	4
Mackinac	3	4	0	0	2
Macomb	116	101	108	98	94
Manistee	3	1	5	2	0
Marquette	8	3	9	4	5
Mason	2	1	2	3	4
Mecosta	5	3	2	4	5
Menominee	2	2	0	0	3

Appendix A. Total Number of Resident Child Deaths by Year and by County of Death *(Continued)*

County	2015	2016	2017	2018	2019
Midland	8	5	3	6	4
Missaukee	0	3	1	0	1
Monroe	14	16	18	16	17
Montcalm	9	5	13	7	13
Montmorency	0	0	1	0	0
Muskegon	30	28	27	22	18
Newaygo	3	5	5	3	10
Oakland	111	123	121	125	96
Oceana	3	6	1	3	4
Ogemaw	2	2	1	7	1
Ontonagon	0	0	0	2	0
Osceola	6	3	3	6	5
Oscoda	3	0	1	2	0
Otsego	2	6	2	3	3
Ottawa	33	32	29	27	25
Presque Isle	3	1	5	2	1
Roscommon	1	1	1	4	2
Saginaw	28	39	22	34	27
St. Clair	15	16	13	16	20
St. Joseph	7	10	7	14	9
Sanilac	7	7	4	4	2
Schoolcraft	0	0	0	0	0
Shiawassee	10	9	8	10	7
Tuscola	6	4	7	6	5
Van Buren	14	10	10	10	5
Washtenaw	28	49	28	29	34
Wayne	342	326	337	360	330
Wexford	5	3	4	7	3
Unknown	1	4	0	1	4

Appendix B. Total Number of Child Deaths Reviewed by Year and by County of Review

County	2015	2016	2017	2018	2019
Alcona	1	0	0	0	0
Alger	0	0	0	0	0
Allegan	5	9	0	19	0
Alpena	0	0	0	0	1
Antrim	2	0	0	0	0
Arenac	0	0	4	0	0
Baraga	0	2	0	0	0
Barry	4	0	7	1	8
Bay	4	4	1	3	2
Benzie	4	0	0	0	3
Berrien	6	27	17	16	10
Branch	10	9	8	8	5
Calhoun	7	8	8	4	2
Cass	2	7	9	3	9
Charlevoix	0	0	0	0	0
Cheboygan	2	1	1	4	1
Chippewa	1	0	0	2	5
Clare	2	1	0	5	6
Clinton	2	4	8	4	3
Crawford	0	2	1	0	3
Delta	0	2	0	3	0
Dickinson	3	1	1	6	0
Eaton	0	0	6	4	17
Emmet	0	0	0	0	0
Genesee	39	31	24	27	20
Gladwin	6	1	2	3	4
Gogebic	3	0	4	0	0
Grand Traverse	18	18	11	8	14
Gratiot	6	2	4	2	3

Appendix B. Total Number of Child Deaths Reviewed by Year and by County of Review *(Continued)*

County	2015	2016	2017	2018	2019
Hillsdale	4	8	8	4	7
Houghton	6	5	0	5	0
Huron	0	0	0	1	0
Ingham	18	25	10	15	23
Ionia	0	4	6	7	6
Iosco	3	1	1	5	2
Iron	1	0	1	0	1
Isabella	6	4	5	2	6
Jackson	11	7	15	3	12
Kalamazoo	17	14	25	13	9
Kalkaska	0	0	0	0	0
Kent	24	21	20	21	23
Keweenaw	0	0	0	0	0
Lake	0	0	0	0	2
Lapeer	7	3	5	6	9
Leelanau	0	0	0	0	0
Lenawee	6	9	5	6	9
Livingston	10	13	10	14	7
Luce	1	0	1	0	0
Mackinac	2	0	0	0	0
Macomb	34	14	0	0	0
Manistee	0	6	0	3	0
Marquette	5	1	7	6	3
Mason	5	0	5	2	7
Mecosta	1	1	0	2	3
Menominee	0	1	0	0	0
Midland	8	0	1	0	0
Missaukee	5	3	1	2	0
Monroe	7	13	11	10	13

Appendix B. Total Number of Child Deaths Reviewed by Year and by County of Review *(Continued)*

County	2015	2016	2017	2018	2019
Montcalm	8	5	15	6	15
Montmorency	0	0	1	0	0
Muskegon	19	6	11	16	5
Newaygo	3	3	1	1	3
Oakland	28	23	37	29	24
Oceana	0	20	7	0	4
Ogemaw	1	1	0	6	2
Ontonagon	0	0	0	0	1
Osceola	0	0	10	4	5
Oscoda	4	0	0	0	0
Otsego	3	5	3	0	6
Ottawa	13	16	9	8	4
Presque Isle	0	0	0	0	0
Roscommon	0	1	1	5	0
Saginaw	12	17	9	9	43
St. Clair	12	14	11	6	24
St. Joseph	9	10	7	10	9
Sanilac	3	3	2	1	1
Schoolcraft	1	1	0	0	0
Shiawassee	4	11	4	7	7
Tuscola	6	0	6	6	6
Van Buren	12	9	12	8	6
Washtenaw	5	12	27	6	8
Wayne	144	129	138	138	121
Wexford	2	2	5	7	3