

2023 Child Fatality Annual Report

2023 Report to the 113th Tennessee General Assembly

Tennessee Department of Health | Division of Family Health and Wellness | July 2023



Table of Contents

Dedication.....	1
Acknowledgements.....	2
Data Confidentiality.....	2
Executive Summary.....	3
Summary of 2023 Recommendations.....	4
State Child Fatality Team Members.....	7
Introduction.....	9
2023 Child Fatality Report.....	10
Overall Child Fatality Trends	10
Preventability	10
Manner of Death	12
Cause of Death	12
Detailed Review: Specific Causes of Child Death.....	13
Homicide	13
Suicide	15
Firearm Deaths	17
Motor Vehicle and Other Transport Deaths	19
Drowning Related Deaths	21
Fire/Burn Deaths	23
Fall	24
Poisoning Deaths	25
Overall Infant Mortality Trends.....	26
Deaths Due to Prematurity.....	28
Perinatal Mortality.....	29
Sleep-Related Infant Deaths.....	30
Sudden Death in the Young (SDY) Case Registry Project.....	32
Data to Action.....	34
Conclusion.....	35
Appendices.....	36
Appendix A—Glossary of Acronyms	36
Appendix B—List of Tables and Figures	37
Appendix C—Trend of Child Suicide Deaths (Ages 0-17) in Tennessee, 2011-2021	38
Appendix D—Infant and Child Deaths by Region of Residence	40
Appendix E—Success Stories	41

It is with deepest sympathy and respect that we dedicate this report to the memory of those children and families represented within these pages.

Acknowledgements

The Tennessee Department of Health expresses its gratitude to the agencies and individuals who have contributed to this report and the investigations that preceded it.

Thank you to the 34 Child Fatality Review Teams in the judicial districts across the state who treat each case with reverence and compassion, working with a stalwart commitment to preventing future fatalities. A complete list of Child Fatality Review Team members is available at www.tinyurl.com/CFR-team-members.

Thank you to the State Child Fatality Prevention Review Team members who find ways to put the recommendations in this report to work in saving lives.

Their efforts, and ours, are reinforced immeasurably by the support and cooperation of the following Tennessee agencies: the Commission on Children and Youth, Department of Children's Services, the Office of the Attorney General, the Tennessee Bureau of Investigation, the Department of Mental Health and Substance Abuse Services, the Department of Intellectual and Developmental Disabilities, the Tennessee Medical Association, the Department of Education, the State General Assembly, the State Supreme Court, the Tennessee Suicide Prevention Network, Tennessee local and regional health departments, Tennessee Hospital Association, law enforcement agencies, and the National Center for Fatality Review and Prevention.

This report may be accessed online, www.tinyurl.com/CFR-annual-reports.

Data Confidentiality

Please note: Portions of the information and data contained in this report were compiled from records that are confidential and contain information, which is protected from disclosure to the public, pursuant to Tennessee Code Annotated 68-142-108.

Executive Summary

The data contained in this report represent the review of deaths occurring in children ages 17 years old and younger during the calendar year of 2021. There were 926 child deaths in 2021, and 906 of those cases met the child fatality review requirement. Ninety-five percent (n=862) of all eligible deaths were included in this report. Deaths that did not meet the viability statute were not reviewed. The state child fatality review team developed the following report and recommendations based on these reviews.

2021 Child Deaths

- 926 deaths occurred in children ages 17 years old and younger across Tennessee. Tennessee's 2021 child mortality rate (60.4 deaths per 100,000 children) is 19.7% higher than the national rate.
- The review team deemed almost **1 in 2 child deaths** (47.5%) as probably **preventable**.
- **Firearm deaths were the leading external cause of death among Tennessee children.** The rate of firearm death was 5.5 deaths per 100,000.
- Between 2017 and 2021, the rate of **homicide** among Tennessee children **increased by 18.9%**.
- The rate of suicide has decreased steadily among Tennessee children over the past five years. **Between 2017 and 2021, the rate of suicide among children in Tennessee decreased by 29%**.
- **Motor vehicle crashes (MVC) and transportation-related deaths were the second leading external cause of death among Tennessee children.**

2021 Infant Deaths

- **Infant mortality is the largest single contributor to child fatality.**
- Tennessee's infant mortality rate (IMR) was 6.2 per 1,000 live births, a 16.2% decrease from 2017's rate of 7.4 deaths per 1000 live births.
- **Prematurity** (55%) and **low birthweight** (57%) were **leading risk factors** for infant deaths.
- In the past five years, **sleep-related deaths accounted for over 1 in 5 (23%) of all infant deaths.**
- Racial disparity continues to exist in sleep-related deaths. Over the past five years, **Black infants were 2-4 times as likely** to suffer a sleep-related fatality as White infants.

Summary of 2023 Recommendations

Infant mortality - Safe Sleep/Prematurity

Deaths due to prematurity and unsafe sleep continue to be leading causes of preventable infant deaths. The following strategies have been recommended to continue addressing the risk factors and disparities to infant safe sleep and prematurity:

- **Determine areas with largest disparities to target and outreach to high-risk populations.**
- **Expand safe sleep efforts to develop and disseminate public service announcements and continue efforts such as the safe sleep diaper bag project, hospital project, and general distribution of safe sleep materials.**
- **Increase TDH infrastructure to reduce infant mortality through establishment of a state position focused on preventing deaths due to prematurity and unsafe sleep.**
- **Reevaluate strategies around most effective communities through needs assessments, focus groups and sustained infant death reduction in select areas.**
- TDH should establish a position that will specifically focus on infant mortality reduction. This position would lead infant mortality strategic planning, conduct focus groups to identify barriers and facilitators to practicing safe sleep, track progress on reducing risk factors and increasing protective factors, facilitate cross-sectional collaborations to: partner between health and housing agencies, manage the safe sleep campaign, oversee infant mortality reduction contractors, and provide technical assistance to the fetal and infant mortality teams.
- TDH should explore infant mortality data by region to determine areas that have seen sustained reductions and successful strategies utilized that could be replicated across the state.
- TDH should continue to promote and support the safe-sleep diaper bag project through the EBHV (www.tinyurl.com/health-EBHV) and CHANT (www.tinyurl.com/health-FHW-CHANT) programs. TDH should continue to collaborate with local birthing hospitals to encourage the facilities to meet the Breastfeeding, Early elective delivery and Safe sleep for Tennessee babies (BEST) criteria.
- TDH should continue to purchase portable cribs, sleep sacks and educational materials for hospitals, local health departments, and community agencies for distribution to families in need of a safe sleep environment. TDH, DCS, TCCY, and Nurture the Next (www.nurturethenext.org) should continue to provide safe sleep education and materials to caregivers of infants.
- TDH should partner with DCS, TCCY, Nurture the Next and other agencies to promote the PSA—focused on multigenerational families—that was created in 2022. Also, TDH should develop and broadcast a PSA focused on women of childbearing age.

Intentional violence- Homicide/Suicide/Firearm

Deaths due to firearm, homicide, and suicide continue to be leading causes of death among older children. Therefore, the following strategies are recommended:

- **Increase suicide and homicide prevention for youth across the state by partnering with agencies around safe storage of firearms, implementing Sources of Strength, increasing Gatekeeper training, encouraging health care providers to complete the Counseling on Access to Lethal Means (CALM) training, and strengthening gun safety standards in schools.**
- TDH should continue to partner with other agencies, such as Tennessee Bureau of Investigation and Tennessee Suicide Prevention Network (TSPN), www.tspn.org, to improve safe storage of firearms. Activities should include providing gun locks, promoting awareness of stolen firearms, and educating the public about gun safety/reduction of access to lethal means. TDH should continue to promote CALM, <https://zerosuicide.edc.org/resources/trainings-courses/CALM-course>, across the state. CALM is a free online training to equip professionals with strategies to help those at risk for suicide and put time and distance between themselves and any lethal means. CALM encourages safe storage of lethal means, such as firearms and medications, during a suicidal crisis.
- TDH should collaborate with TSPN and DOE to provide training for school personnel along with other community agencies to implement Sources of Strength curriculum (<https://sourcesofstrength.org>), a best-practice youth suicide prevention project designed to change unhealthy norms and culture, ultimately preventing suicide, bullying, and substance abuse. DOE should explore options for conducting Sources of Strength before, during, and after school programs. Tennessee Bureau of Investigation should partner with law enforcement to recruit school resource officers to participate in Sources of Strength, particularly in high-risk areas of the state.
- TDH, DOE, TCCY, TDMHSAS, DCS and Nurture the Next should continue to provide Gatekeeper training—on warning signs of suicide and how to respond—to their staff and promote suicide prevention PSAs on social media and program websites to increase community members’ and professionals’ knowledge of suicide prevention.
- TDH should continue to monitor weekly suicide attempts in ESSENCE and notify community partners when there are alerts, <https://tspn.org/essence>. TDH, TSPN, and TDMHSAS should continue to collaborate with these partners to increase the number of actions taken, such as offering gatekeeper training, based on these alerts.
- TDH should continue to work with ETSU to implement a trauma informed workplace designation and recruit agencies that work with children to meet the criteria for the designation, <https://www.traumainformedworkplace.org>.

Motor Vehicle Crashes

MVC continues to be a top cause of death among teenagers. In addition, improper car seat use is a contributing factor to MVC deaths among younger children. Therefore, the following strategies to address MVC deaths are recommended:

- **Increase awareness of counties at high-risk for motor vehicle crashes (MVC) and provide technical assistance for them to implement evidence-based MVC prevention programs in local high schools.**
- **Explore strategies to reduce distracted driving.**
- **Promote correct car seat use.**
- TDH and DOE should work with schools that have participated in Checkpoints™, <https://youngdriverparenting.org/home-2/welcome-to-checkpoints-tennessee>, to develop success stories to distribute to other schools. The success stories should discuss implementation of Checkpoints™ and/or other evidence based MVC prevention. Success stories should be disseminated throughout the state, with a particular focus on high-risk counties, to assist them with participation in MVC prevention.
- TDH should increase awareness of motor vehicle/transportation safety messaging among high-risk counties by developing and disseminating fact sheets with injury prevention strategies to these counties. TDH should partner with DOE to disseminate the fact sheets to a minimum of 10 statewide agencies and schools.
- TDH should continue to recruit schools and provide training to implement evidence-based programs such as Checkpoints™ in high fatality and crash counties. TDH should provide training to other caregiver groups to implement the virtual version of Checkpoints™ in areas of the state in which schools are not currently participating in the program.
- TDH should partner with the Pedestrian Task Force to explore strategies and partnerships that can reduce deaths from MVC. TDH should identify current efforts to reduce distracted driving and strategies to expand those efforts throughout the state utilizing partners interested in MVC prevention such as the Pedestrian Task Force.
- TDH should continue to utilize the Child Safety Fund for the distribution of child safety seats through community non-profit agencies. TDH should disseminate fact sheets about the importance of using car seats.

State Child Fatality Team Members

Chair

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Commissioner
Tennessee Department of Health

Co-Chair

Tobi Amosun, MD, FAAP
Deputy Commissioner for Population Health
Tennessee Department of Health

Members

Monique Anthony, MPH, CHES
Tennessee Department of Health

Valerie Arnold, MD
Tennessee Medical Association

Ibitola Asaolu, DrPH, MPH
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Tennessee Senate

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Tennessee House of Representatives

Introduction

The Child Fatality Review and Prevention Act of 1995 established the Tennessee Department of Health's Child Fatality Review (CFR) program. The mission of the Child Fatality Review is to analyze deaths to understand the causes of child deaths and make and implement recommendations that will prevent future child deaths.

A local CFR team exists in each of Tennessee's judicial districts. These 34 teams cover all 95 counties. Their careful review process results in a thorough description of the factors related to child deaths. Aggregate data from local CFR teams are reviewed by the State CFR Team. The composition of the State CFR Team is outlined in T.C.A. 68-142-103. The State Team analyzes data on the incidence and causes of child deaths and makes recommendations to the Governor and General Assembly, informing the implementation of laws, policies, and practices that may prevent future child deaths in Tennessee.

Child Death Review Criteria

- Decedent is a resident of Tennessee
- Decedent is 17 years of age or younger
- Infant death meets Tennessee's statute of viability, i.e., infant was equal to or greater than 23 weeks of gestation or greater than 500 grams at birth
- Death reviewed by the local team covering decedent's county of residence

Review Cohort

The data contained in this report represent the review of deaths occurring in children 17 years and younger during the calendar year of 2021. There were 926 child deaths in 2021, and 906 of those cases met the CFR review criteria. Ninety-five percent (n=862) of all eligible deaths were included in this report. Deaths that did not meet the viability statute were not reviewed.

Local CFR Team Membership

- Regional Health Officer
- Supervisor of Children's Services
- Medical Examiner
- Prosecuting Attorney
- Local education agency
- Mental health professional
- Pediatrician or Family practice physician
- Emergency medical service provider
- Firefighter
- Juvenile court representative
- Other representatives of agencies that work with children and their families

Records are collected from sources with relevant information for each review, these sources include:

- Birth Transcripts
- Death Certificates
- Autopsy Reports
- Hospital Records
- EMS Run Reports
- Department of Children's Services
- Police / Motor Vehicle Crash Reports
- Sudden Unexpected Infant Death Forms
- Medical Records
- Newborn Screening
- Mental Health Records
- School Information

Data Collection

Data is collected on all cases reviewed and entered into a database through the National Center for Fatality Review and Prevention. For more information on the NCFRP along with training videos and details about understanding CFR in every state please visit <https://ncfrp.org/>.

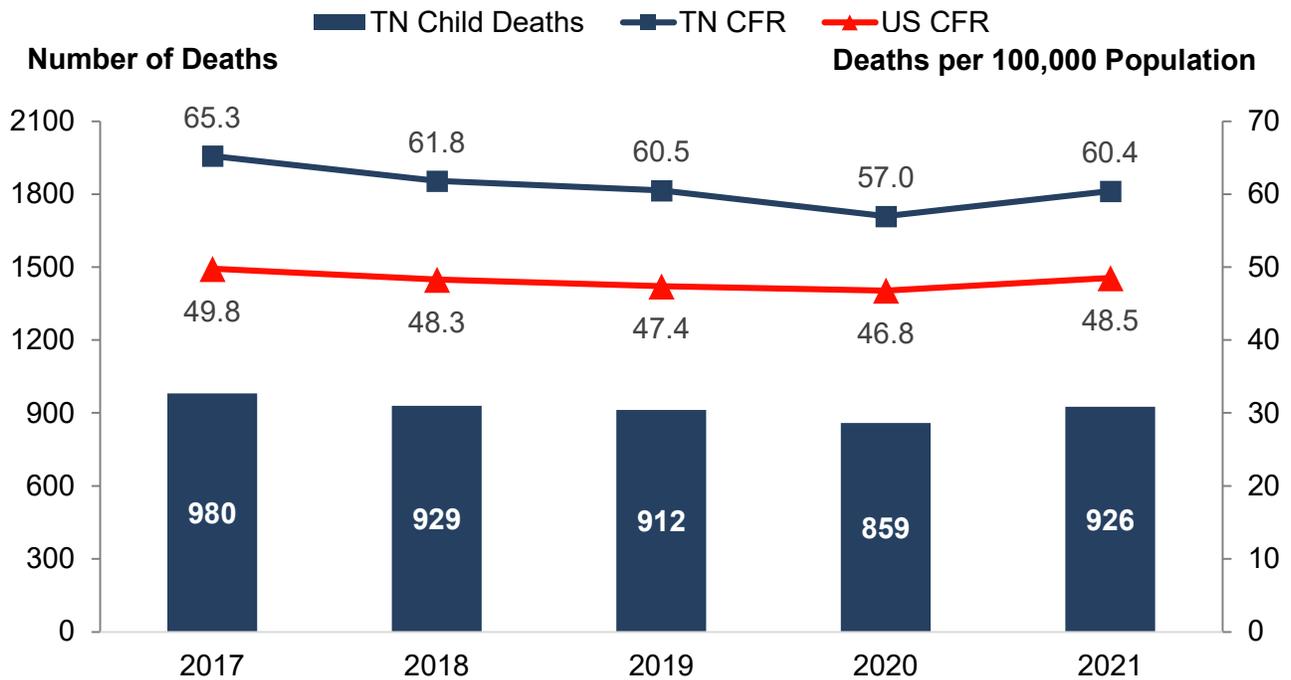
2023 Child Fatality Report

Overall Child Fatality Trends

Child health is a critical indicator of a society’s wellbeing. The careful examination of each child’s death gives additional context regarding how best to respond to a fatality and prevent future deaths.

In 2021, 926 Tennessean children died from unintentional injuries, prematurity, and birth defects, among others. **Tennessee’s child mortality rate continues to exceed the national rate.** Tennessee’s 2021 child fatality rate (60.4 deaths per 100,000 children) is 19.7% higher than the U.S. child fatality rate.

Figure 1. Number and Rate of Child Deaths (Ages 0-17 Years) Tennessee, 2017-2021



TN Death: Tennessee Department of Health, Division of Vital Records and Health Statistics, Death Statistical File, 2017-2021
 Population estimates based on interpolated data from the U.S. Census’s Annual Estimates of the Resident Population; National Rates: CDC Wonder

Preventability

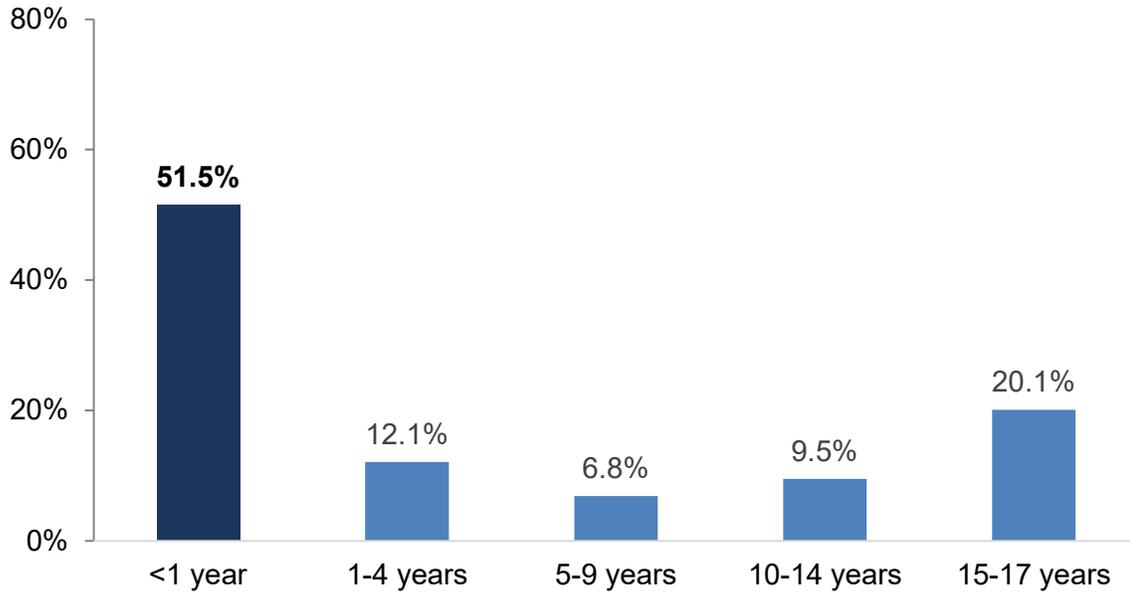
Almost 1 in 2 child deaths (47.5%) was probably preventable. The review team deemed most (93.7%) child deaths with an external cause of mortality as probably preventable but only a few (5.8%) child deaths resulting from medical conditions as probably preventable.



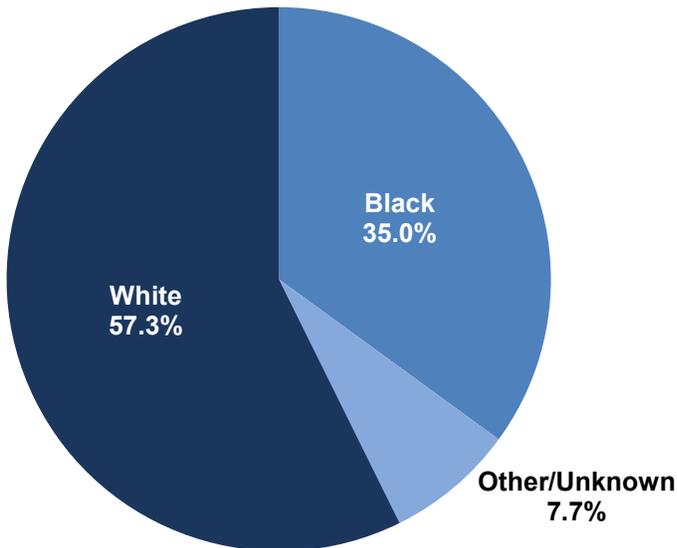
Almost 1 in 2 child deaths (47.5%) was probably preventable.

Figure 2. More than Half of All Child Deaths Reviewed were <1 Year of Age, Tennessee, 2021 (N=862)

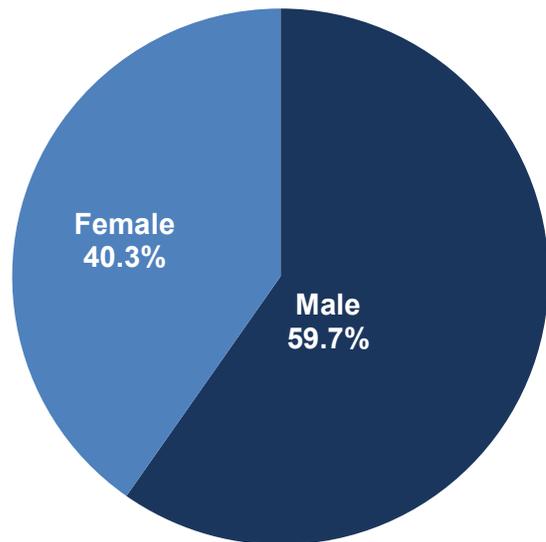
Percent of Child Deaths



**Figure 3: Child Deaths by Race
N=862**



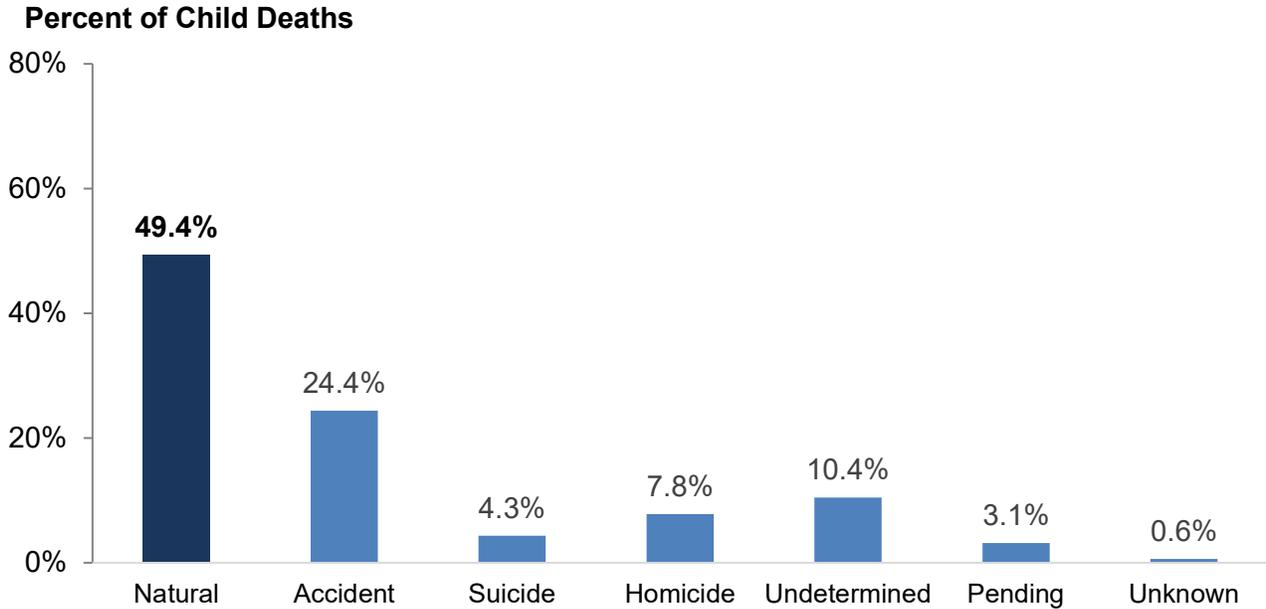
**Figure 4: Child Deaths by Sex
N=862**



Other race includes all other non-White or non-Black races.
Data source: Tennessee Department of Health, Child Fatality Review Database System

Manner of Death

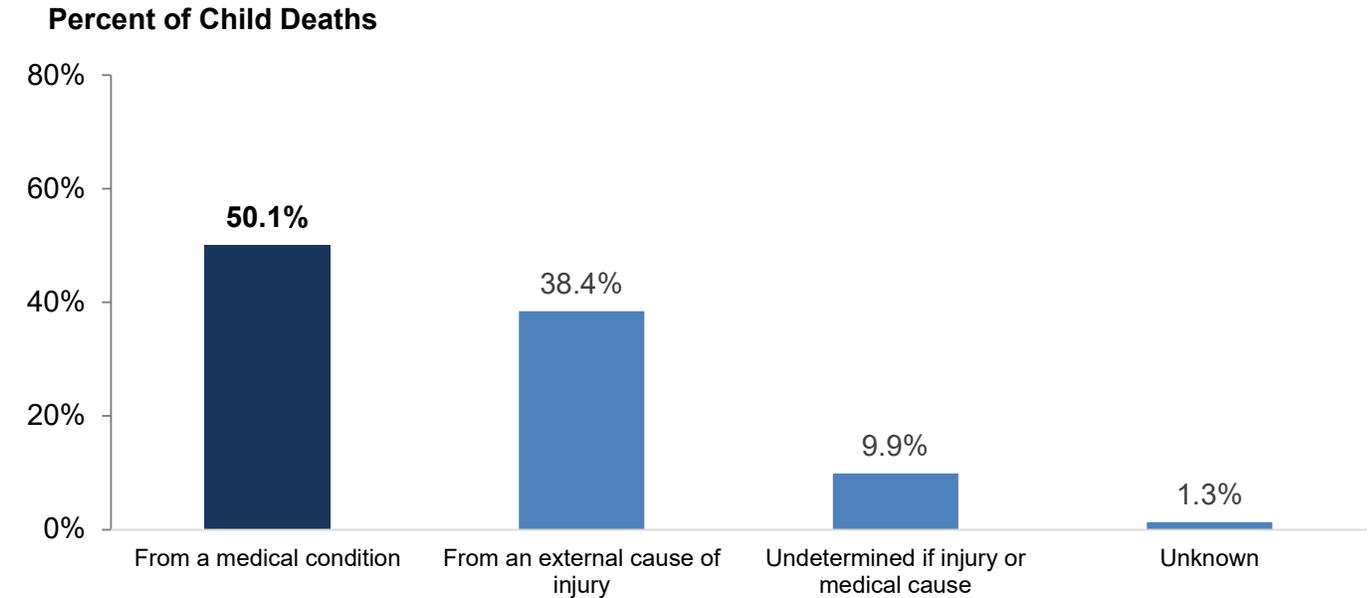
Figure 5. Almost Half of All Child Deaths (Ages 0-17 Years) in Tennessee were by Natural Means, 2021 (N=862)



Data source: Tennessee Department of Health, Child Fatality Review Database System

Cause of Death

Figure 6. Half of All Child Deaths (Ages 0-17 Years) were Caused by a Medical Condition Tennessee, 2021 (N=862)



Data source: Tennessee Department of Health, Child Fatality Review Database System.

Detailed Review: Specific Causes of Child Death

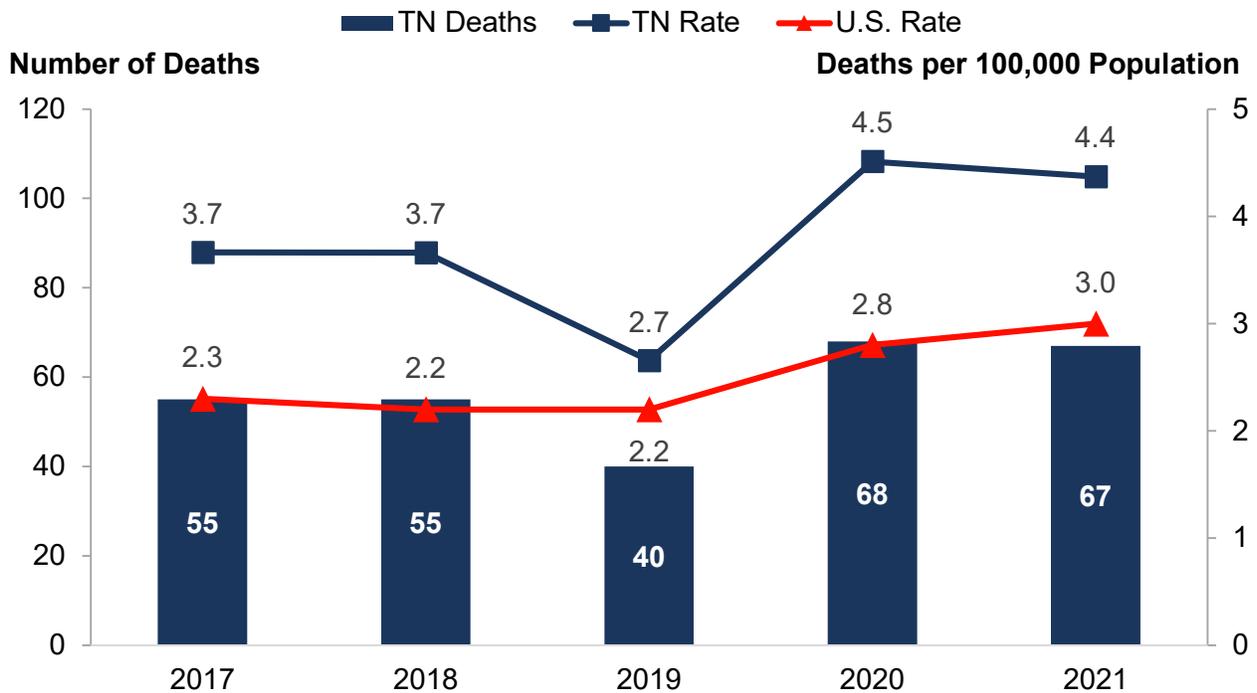
Homicide

Homicide is a leading cause of death among children in Tennessee and across the nation. In 2021, **67 Tennessee children died by homicide**. Between 2017 and 2021, the rate of homicide among Tennessee children **increased by 18.9%**. The burden of homicide among Tennessee children is higher among Blacks, males, and children aged 15 to 17 years, with **firearms being the leading means of lethality**.

Prevention opportunities include:

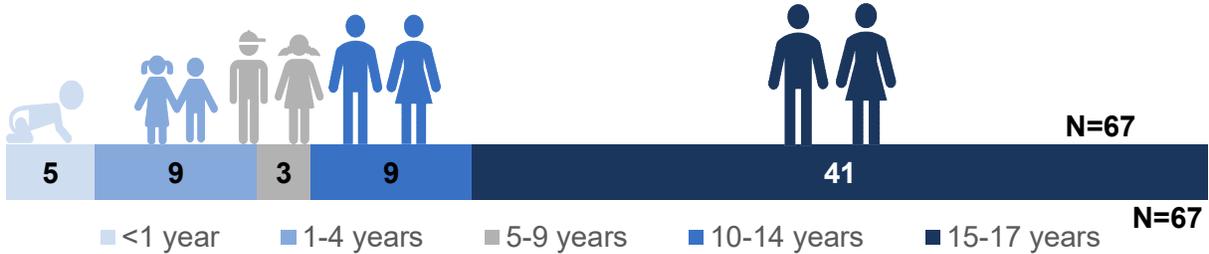
- **Practicing gun safety and safe storage of weapons.** To learn more about safe storage of firearms visit the BeSMART website, <https://besmartforkids.org>.
- Increasing engagement of high-risk parents in intensive early intervention services.
- Raising public awareness around ACEs and their impact upon the risk of intentional injury.

Figure 7. Homicide Deaths and Rates per 100,000 Population (Ages 0-17 Years), Tennessee and US, 2017-2021



Data Source: Tennessee Department of Health, Child Fatality Review Database System and population estimates based on interpolated data from the U.S. Census's Annual Estimates of the Resident Population.

More than half (61%) of all cases of child homicide occurred among children 15-17 years.

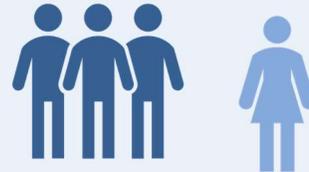


The number of Black victims of homicide is > 4x that of White victims.



53 Black Children : 12 White Children

The number of male victims of homicide is 3x that of females.



52 Males : 15 Females

Location of Death



Home of Child
25%



Home of Friend/Relative
10%



Roadway
18%



Other*
31%



Unknown
8%

Method of Lethality



Firearms were the weapon of lethality involved in most (86%) homicides.

Preventability



Local review teams described most (94%) homicides as probably preventable.

*Other includes school, hospital, recreation area, foster care, parking area, and other unspecified
Data source: Tennessee Department of Health, Child Fatality Review Database System

Suicide

Suicide is the second leading cause of death among American children¹ aged **10-14 years** and third leading cause of death among youth aged 15-24 years. In 2021, **37 Tennessee children died by suicide**. The rate of suicide in Tennessee children has decreased steadily over the years, with the 2021 suicide rate (2.4 deaths per 100,000) being the same as the national average. **Between 2017 and 2021, the rate of suicide among children in Tennessee decreased by 29%.**

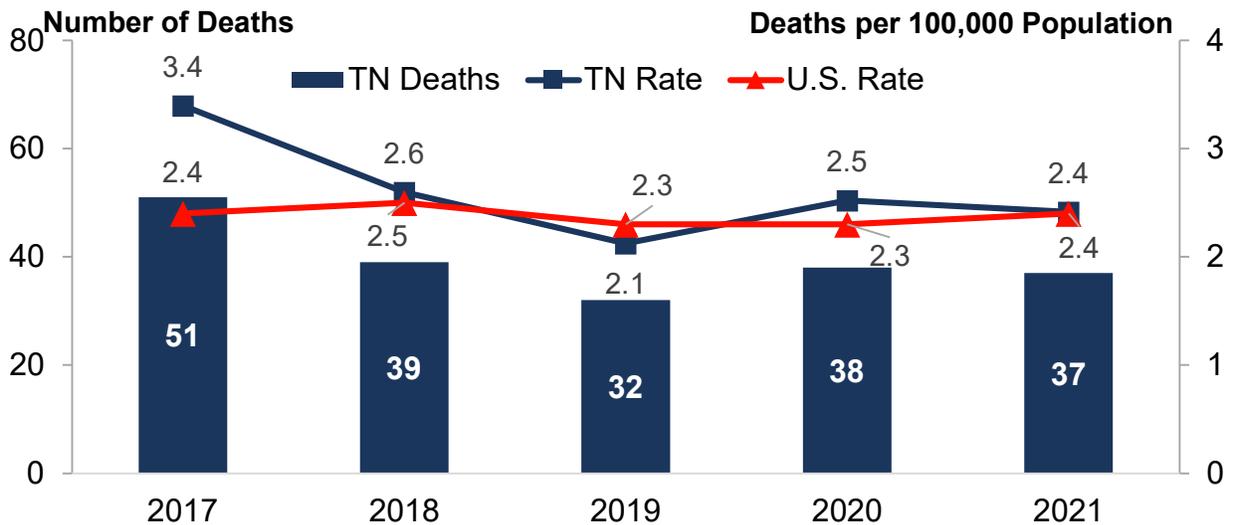
An addendum was prepared to further explore suicide among children over the past 10 years. Analysis revealed that although the rate of suicide among Tennessee children in 2017 was higher than previous years, careful examination of data showed similar disparities in age, sex, race, and other risk factors with other year. Refer to Appendix C for additional information.

Tennessee has focused on addressing suicide among children through its Comprehensive Suicide Prevention (CSP) and Tennessee Child and Adolescent Education and Support (TCAPES) programs' activities including:

- Using ESSENCE to monitor suicidal behavior.
- Implementing the Sources of Strength program by recruiting youth and trusted adults in schools and community-based organizations in high-risk areas of the state.
- Working with K-12 schools, higher education institutions, and faculty to update and promote suicide prevention, intervention, and postvention policies and plans.
- Providing free same-day phone consultation via TCAPES at (901) 395-2124 with a mental health provider, behavioral health training for primary care providers, and assistance with finding community behavioral health resources.

Visit the TCAPES website for additional information, www.tinyurl.com/health-TCAPES.

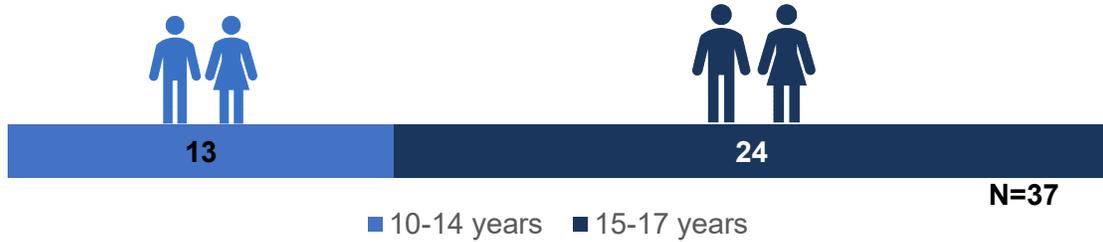
Figure 8. Suicides and Suicide Rates per 100,000 Children (Ages 0-17 Years), Tennessee and US, 2017-2021



Data source: Tennessee Department of Health, Child Fatality Review Database System and population estimates based on interpolated data from the U.S. Census's Annual Estimates of the Resident Population.

¹ Source for child health statistics: <https://www.cdc.gov/nchs/fastats/child-health.htm>

Adolescents aged 15-17 years have a higher burden of suicide than those 10-14 years.



The number of White victims of suicide is over 6x that of Black victims.



The number of male victims of suicide is 5x that of females.



Method of Suicide



Firearm
54%



Hanging
27%



Other
11%



Poisoning
8%

Location of Death



Home of Child
76%



Home of Relative
5%



Unknown
8%

Preventability



86% of deaths by suicide were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System

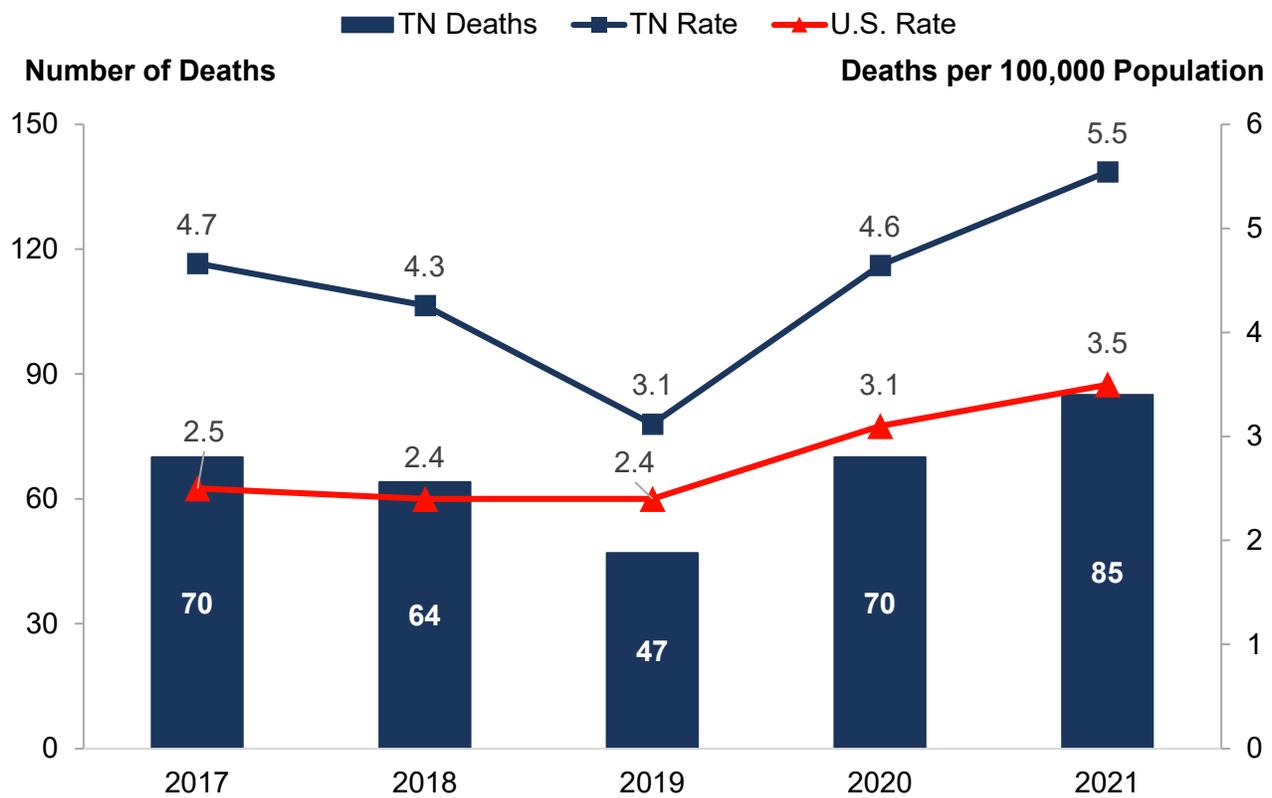
Firearm Deaths

Firearm deaths are a leading external cause of child death in Tennessee and across the United States. Tennessee's 2021 firearm death (n=85) and rate in children (5.5 deaths per 100,000) represents a 17.0% increase since 2017 and a 36.4% higher rate than the 2021 national average. Evidence from the review of firearm deaths shows that most (93%) firearm child deaths were preventable.

Prevention opportunities include:

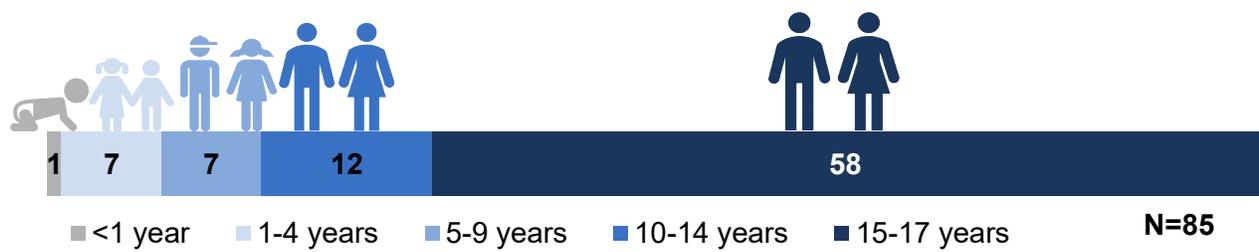
- Increasing awareness and promotion of **safe firearm handling and access to safe storage mechanisms**.
- Promoting safety programs which encourage parental supervision and prevent unsafe child-weapon interactions.

Figure 9. Firearm-Related Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee, 2017-2021

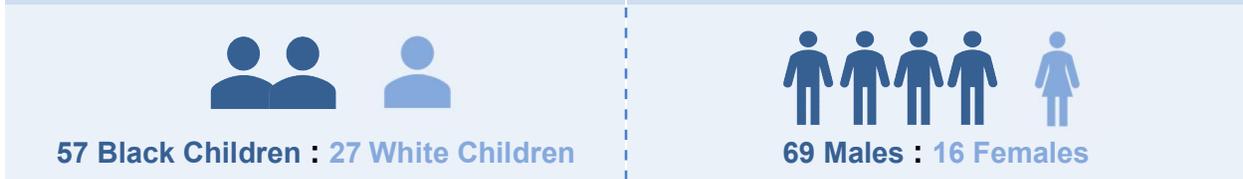


Data source: Tennessee Department of Health, Child Fatality Review Database System and population estimates based on interpolated data from the U.S. Census's Annual Estimates of the Resident Population.

Firearm deaths affect children across all age groups. Those aged 15-17 years are most impacted.



The number of Black victims of firearm deaths is 2x that of White victims. The number of male victims of firearm deaths is 4x that of females.



Manner of Death



Firearm deaths were mostly due to homicides (65%), suicides (24%), and accidents (5%).

Preventability



93% of firearm deaths were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System.

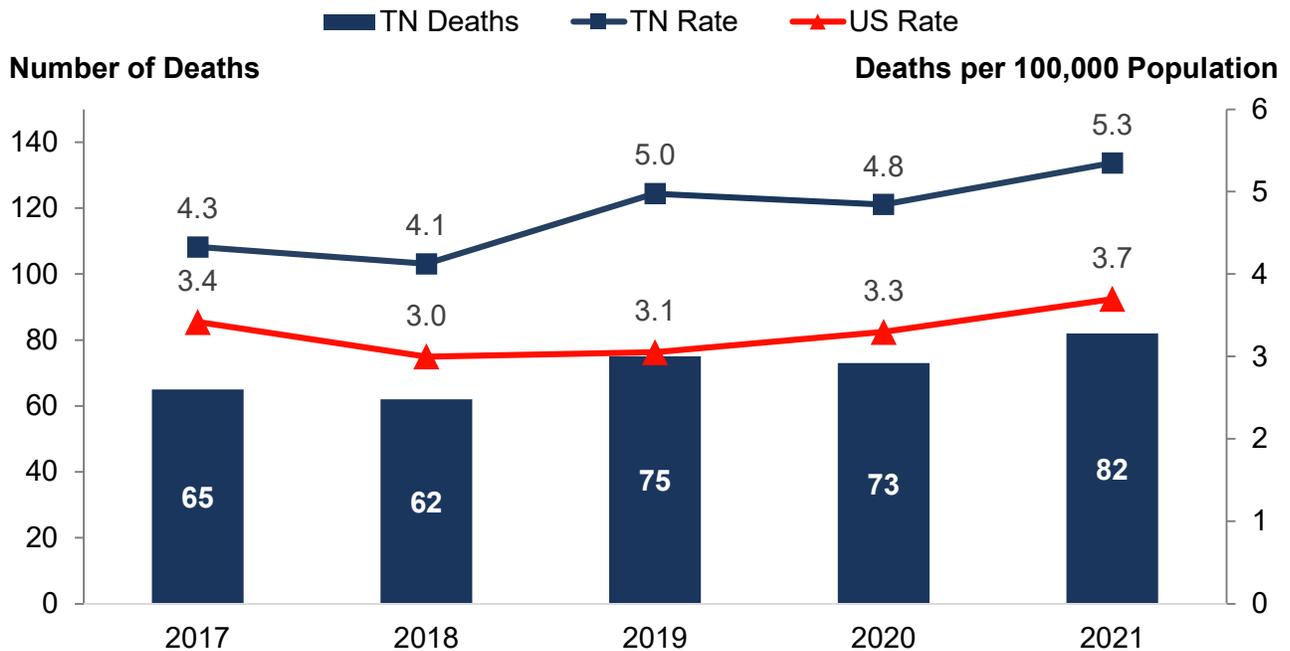
Motor Vehicle and Other Transport Deaths

In 2021, **82 children in Tennessee died from an MVC/transportation injury**, representing the second highest external cause of death. Tennessee’s MVC fatality rate (5.3 per 100,000) in children is **43.2% higher than the national average**. Over one-third² (38%) of American children who died from a motor vehicle crash in 2020 did not use an appropriate restraining method. Evidence from national data shows the importance of driver education, using car restraints, and complying with traffic rules to reduce MVC deaths.

Prevention opportunities include:

- Imposing stricter nighttime driving restrictions for teen drivers.
- Promoting the importance of infant and child car seats and booster seats for infants, toddlers, and young children.
- Enforcing laws which prohibit texting and driving.
- Encouraging school participation in teen driver safety programs such as Checkpoints™.

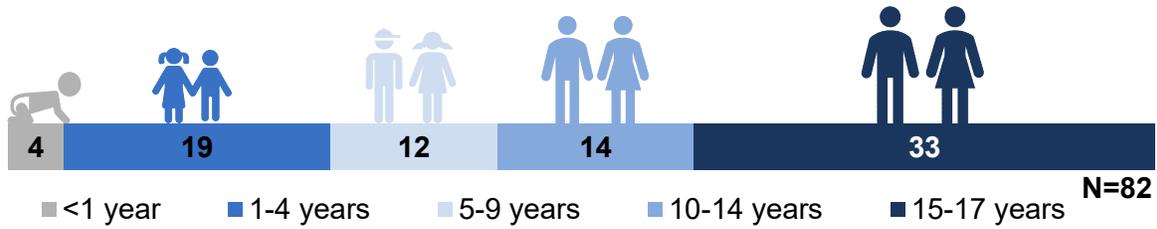
Figure 10. Motor Vehicle and Other Transport-Related Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee, 2017-2021



Data source: Tennessee Department of Health, Child Fatality Review Database System and population estimates based on interpolated data from the U.S. Census’s Annual Estimates of the Resident Population.

² Source for transportation statistics: https://www.cdc.gov/transportationsafety/child_passenger_safety/cps-factsheet.html

MVC/Transportation deaths affect children across all age groups. Those aged 15-17 years are most impacted.



45 White children died from motor vehicle/transportation while 31 Black Children died.



45 White Children : 31 Black Children

47 male children died from motor vehicle/transportation compared to 35 females.



47 Males : 35 Females

Position of Decedent in Motor Vehicle/Transportation Death



Passenger
50%



Driver
27%



Pedestrian
17%



On Bicycle
4%

Preventability



91% of motor vehicle/transportation deaths were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System.

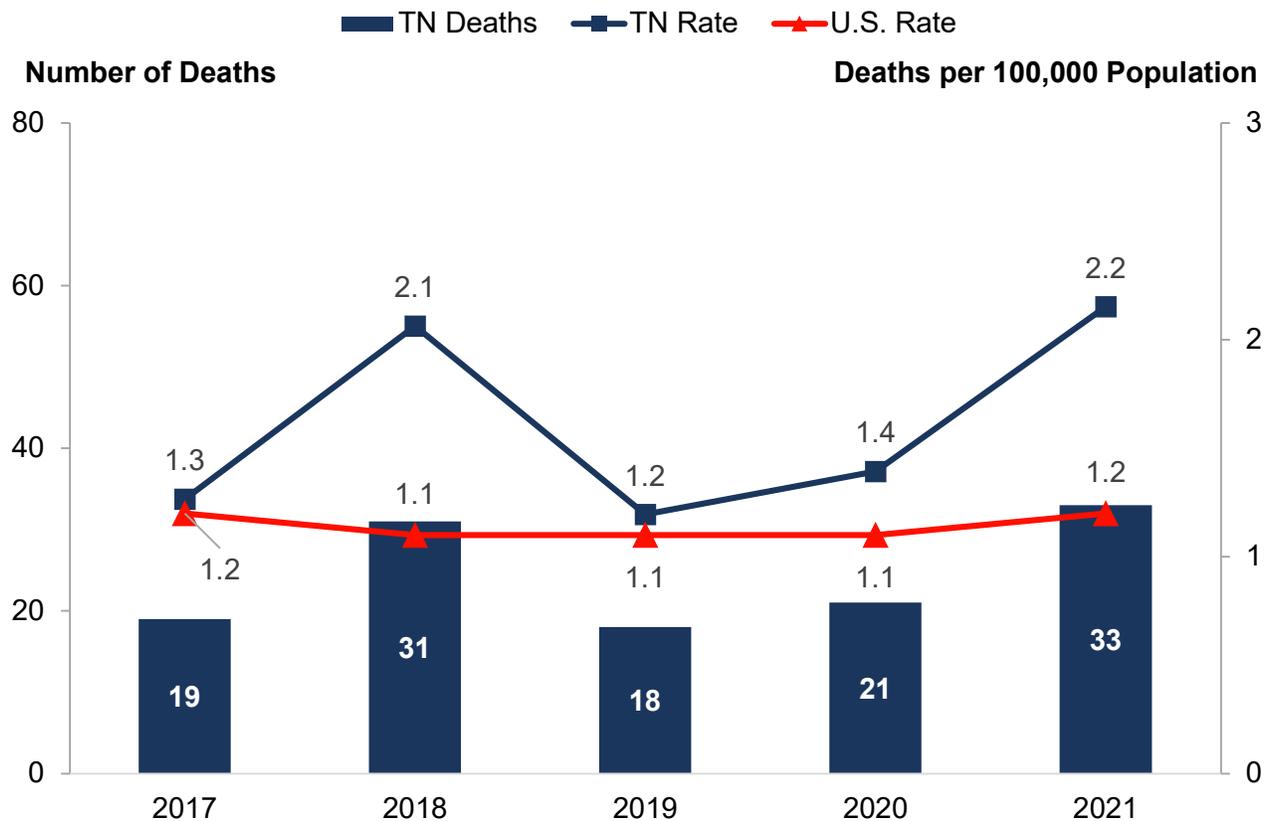
Drowning Related Deaths

Drowning is the leading cause of death among children between 1 and 4 years of age. For every fatal drowning incident, there are seven non-fatal injuries resulting in Emergency Department care. In 2021, 21 children in Tennessee died by drowning. **Two-thirds of Tennessee children who died by drowning died in a pool/hot tub/spa (n=12) or open water (n=10).** The increase in the number of drowning deaths is partly attributable to the August 2021 flood in middle Tennessee that claimed the lives of many Tennesseans, including children.

Prevention opportunities include:

- Raising awareness of emergency preparedness and response during floods.
- Monitoring children in and/or around water.
- Installing multiple layers of protection, including four-sided fences with self-closing and self-latching gates around pools.
- Promoting formal swimming lessons for young children.

Figure 11. Drowning Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee and US, 2017-2021



Data source: Tennessee Department of Health, Child Fatality Review Database System and population estimates based on interpolated data from the U.S. Census's Annual Estimates of the Resident Population.

Deaths from drowning affect Tennessee children across all age groups.



The number of White victims of drowning is over 3x that of Black victims.

21 White Children : 7 Black Children

The number of Male victims of drowning is about 2x that of Females.

21 Males : 12 Females

Location of Death



Preventability

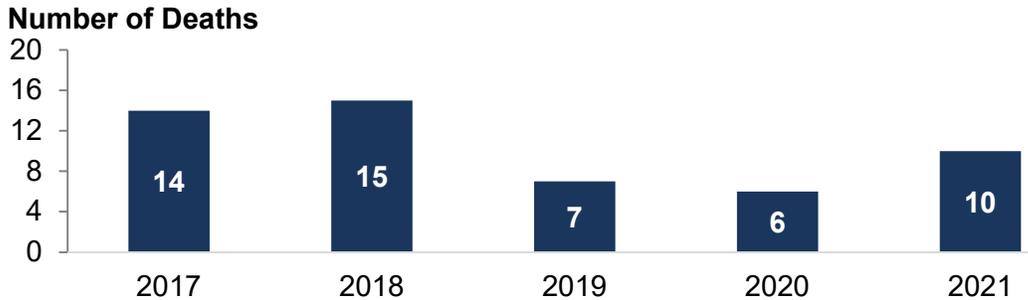
97% of drowning deaths were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System.

Fire/Burn Deaths

Fire-related deaths in Tennessee and the United States have declined gradually over the past several decades. In 2021, 10 children in Tennessee died from a fire or burn; four of these deaths were related to cooking stove and electrical wiring. **All homes should have working smoke alarms throughout** and have **an emergency evacuation plan in place**. If your home doesn't have working smoke alarms or if they are older than 10 years old, you may request free smoke alarms, <https://www.tn.gov/commerce/fire/prevention-education-and-outreach/request-a-free-smoke-alarm.html>.

Figure 12: Fire/Burn-Related Deaths in Children (Ages 0-17 Years), Tennessee, 2017-2021



Children under 10 years of age are most impacted by fire/burn-related deaths.



In 2021, 10 children died from fire or burns.



4 White Children



3 Black Children



3 Children of Other Race

There were 6 male and 4 female victims of fire/burn deaths.



6 Males



4 Females

Mortality



5-year mortality rate TN (2017-2021): **0.7 deaths per 100,000**



5-year mortality rate US (2017-2021): **0.4 deaths per 100,000**

Preventability



80% of fire/burn deaths were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System. Given the low counts of fire/burn deaths in Tennessee, it is impossible to calculate statistically reliable death rates. Therefore, we provide only the counts and a five-year combined fire/burn death rate.

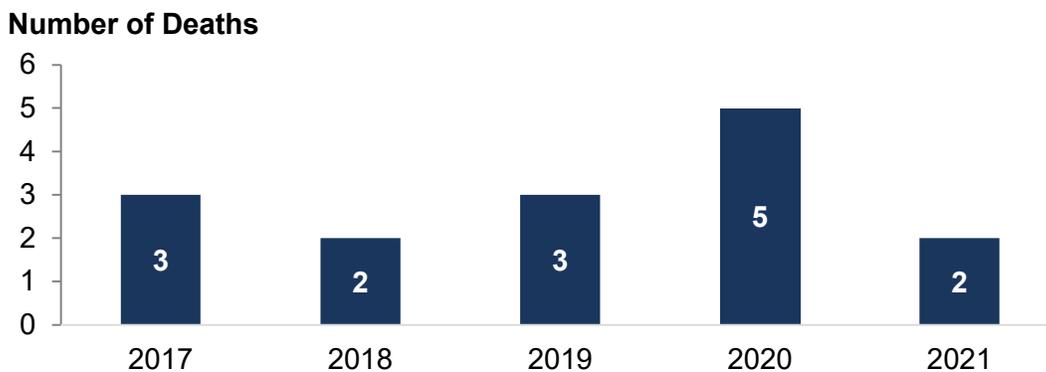
Fall

In 2021, **two children died from a fall or crush injury**. While the rate of fall or crush death is lower than other injuries, **falls are the leading cause of non-fatal injury among children**. Therefore, it is important to promote safety mechanisms against fall-related injury and death.

Prevention opportunities include:

- Increasing awareness regarding the importance of supervision of children in home and outdoor settings.
- Encouraging child safety features, such as window guards, stair gates and guard rails, to prevent accidental falls in homes.

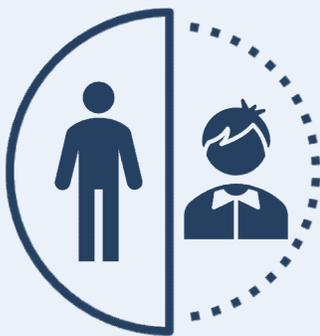
Figure 13: Fall-Related Deaths in Children (Ages 0-17 Years), Tennessee, 2017-2021



Data source: Tennessee Department of Health, Child Fatality Review Database System.

In 2021, 2 children died from a fall.

These children were male:
A toddler, and an older teenager.



Mortality



5-year mortality rate TN (2017-2021):
0.2 deaths per 100,000



5-year mortality rate US (2017-2021):
0.1 deaths per 100,000

Preventability



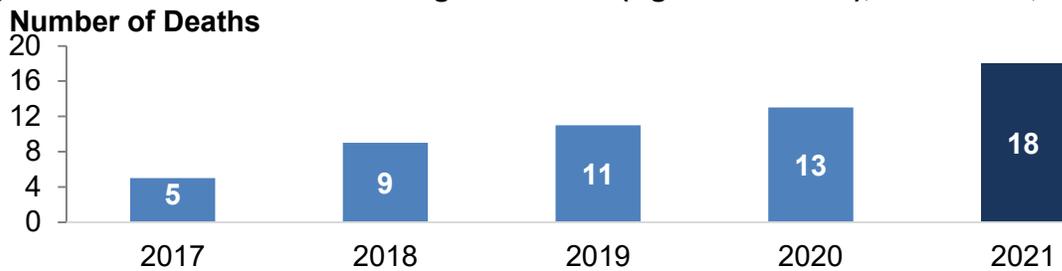
1 of the 2 deaths from fall in 2021 were deemed as probably preventable.

Data source: Tennessee Department of Health, Child Fatality Review Database System. Given the low counts of deaths from fall in Tennessee, it is impossible to calculate statistically reliable death rates. Therefore, we provide only the counts and a five-year combined death rate from falls.

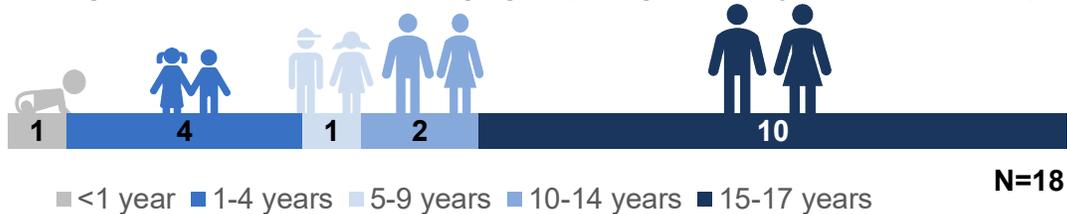
Poisoning Deaths

Between 2017 and 2021, the **number of deaths from unintentional poisoning in Tennessee increased more than threefold**. In 2021, **18 children died from poisoning in Tennessee**, representing almost 2% of all reviewed child fatalities. **Almost half (44%) of unintentional poisoning deaths resulted from prescription medications**. **All 2021 unintentional poisoning deaths were deemed as preventable**. In the event of accidental ingestion contact Poison Control at 1-800-222-1222 or <https://triage.webpoisoncontrol.org>. After completing a simple training and quiz individuals medically prescribed opioids, at high risk for overdose, and their families qualify for free naloxone through TDH: <https://www.tn.gov/health/health-program-areas/health-professional-boards/csm-d-board/csm-d-board/naloxone-training-information.html>.

Figure 14: Deaths due to Poisoning in Children (Ages 0-17 Years), Tennessee, 2017-2021



Poisoning deaths occur across all age groups. Ages 15-17 years are most impacted.



The number of White victims of unintentional poisoning is over 2x that of Black victims.



13 White Children: 5 Black Children

11 male children died from unintentional poisoning compared to 7 females.



11 Males: 7 Females

Causes of Death



8 out of 18 poisoning deaths resulted from prescription medication.



More than 1 in every 3 poisoning deaths were caused by fentanyl.

Preventability



ALL (100%) unintentional poisoning deaths were deemed as probably preventable.

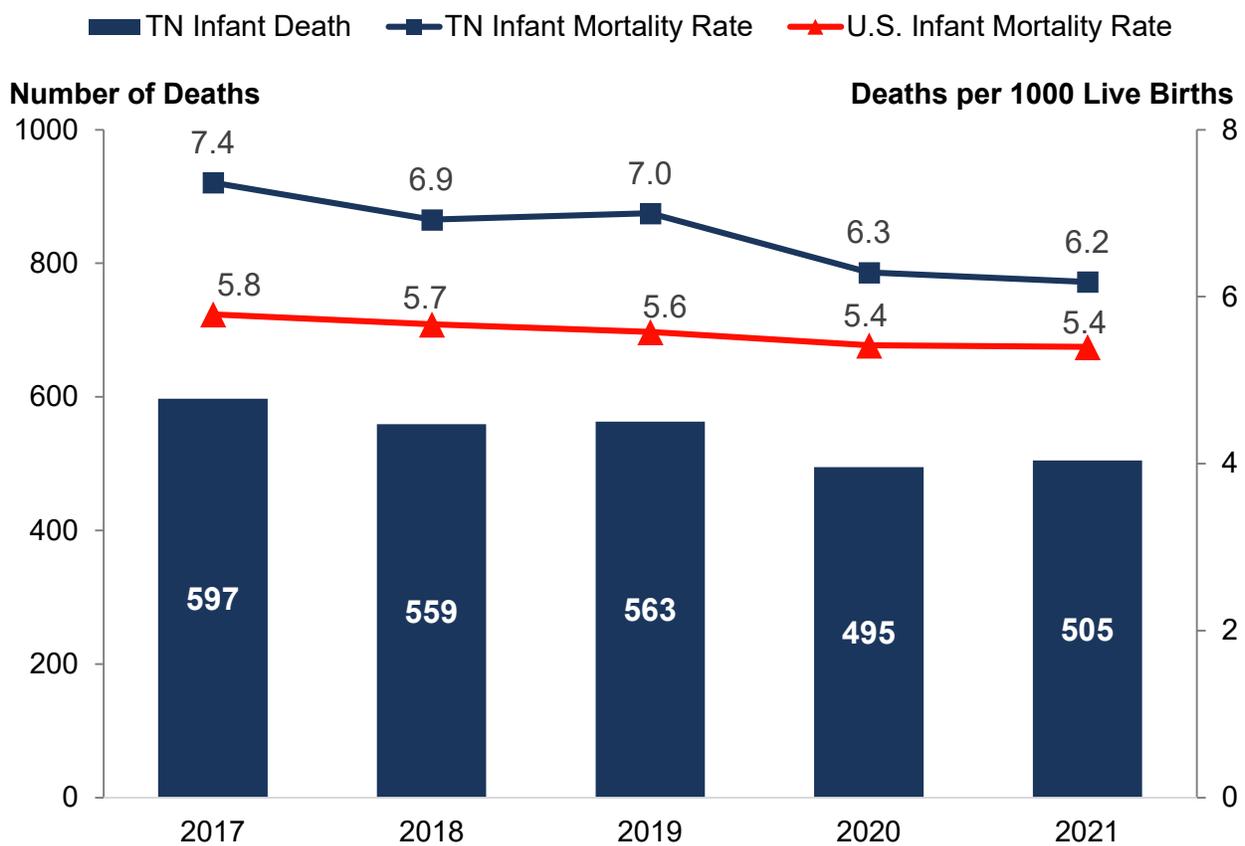
Data source: Tennessee Department of Health, Child Fatality Review Database System.

Overall Infant Mortality Trends

Infant mortality is defined as a death occurring within the first 12 months of life. **Infant mortality is the largest single contributor to child fatality.** Tennessee's infant mortality rate has been on a **gradual decline since 2019**. In 2021, Tennessee's infant mortality rate was 6.2 per 1,000 live births, a **16.2% decrease from 2017's rate** of 7.4 deaths per 1000 live births.

In Tennessee and across the United States, birth defects, preterm birth, low birthweight, accidents, and sudden infant death syndrome continue to be the leading causes of infant deaths.

Figure 15. Number and Rate of Infant Deaths in Tennessee, 2017-2021



Data Source: Tennessee Department of Health, Division of Vital Records and Health Statistics, Death Statistical File, 2017-2021

Table 1. Risk Factors Associated with Infant Deaths Reviewed by Tennessee CFR Teams, 2021*

Risk Factors	Total	Reviewed Infant Deaths(%)	Natural Accident Homicide Undetermined Pending Unknown					
Preterm Birth	246	55%	199	14	2	24	7	0
Low Birthweight	255	57%	202	16	2	27	7	1
Known Intrauterine Smoke Exposure	109	25%	53	28	2	24	1	1
Late (>6 months) or No Prenatal Care**	47	11%	31	7	1	6	1	1
Known Intrauterine Drug Exposure	141	32%	69	34	3	31	4	0

Data source: Tennessee Department of Health, Child Fatality Review Database System

*Data are not mutually exclusive. Multiple risk factors may have been for any given death. Reviewed. As a result, the total risk factor occurrence exceeds the total number of deaths

**Late prenatal care denotes prenatal care that begins at third trimester, 7 to 9 months of pregnancy. Intrauterine drug use describes any form of drug use including over-the-counter, prescription, and illicit drug use. Data source: Tennessee Department of Health, Child Fatality Review Database System.

Table 2. Leading Causes of 2021 Infant Deaths: TN vs U.S.

TENNESSEE		UNITED STATES	
2021		2021	
Rank		Rank	
1	Birth defects	1	Birth defects
2	Accidents (unintentional injuries)	2	Preterm birth and low birthweight
3	Preterm birth and low birthweight	3	Sudden infant death syndrome (SIDS)
4	Sudden infant death syndrome (SIDS)	4	Accidents (unintentional injuries)
5	Maternal complications of pregnancy	5	Maternal complications of pregnancy
6	Complications of placenta, cord, and membranes	6	Newborn Complications of placenta, cord, and membranes
7	Bacterial sepsis of newborn	7	Bacterial sepsis of newborn
8	Diseases of the circulatory system	8	Respiratory distress of newborn
9	Necrotizing enterocolitis of newborn	9	Diseases of the circulatory system
10	Diarrhea and gastroenteritis of infectious origin	10	Intrauterine hypoxia and birth asphyxia

Data source: Tennessee Department of Health, Office of Vital Records and Health Statistics, Death Statistical File; National Center for Health Statistics.

TN reports low birthweight and preterm birth in the same category: most infants who are born preterm are also of low birth weight

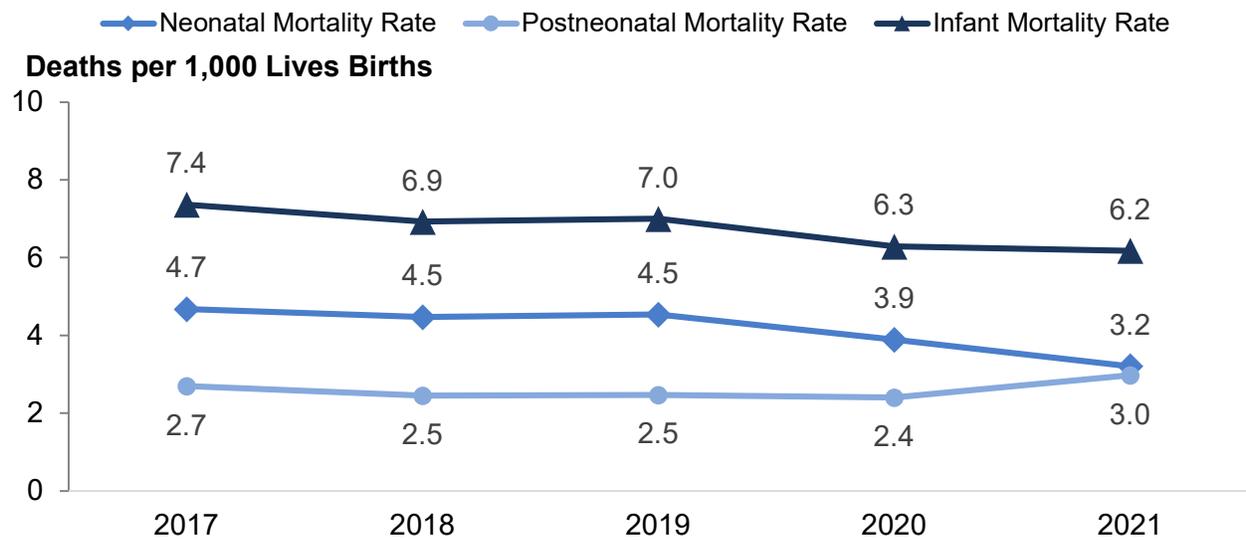
Deaths Due to Prematurity

Prematurity is the leading driver of infant deaths in TN. The gradual decrease in infant mortality might be explained by trends in fetal death, perinatal mortality, neonatal mortality, preterm birth, or low birthweight. Our review of birth records did not show any major changes in preterm birth and low birthweight between 2017-2021 (data not shown). Therefore, this section describes trends in fetal, perinatal, and neonatal, post-neonatal mortality rate and their association with infant mortality.

Neonatal mortality rate (NMR, deaths to infants within the first seven days of life) is an important indicator of infant health. **Tennessee’s NMR has been decreasing since 2018/2019.** Tennessee’s 2021 NMR of 3.2 deaths per 1000 live births is the lowest it has been in five years. The continuous decreasing NMR might be mostly responsible for the overall decline in the IMR between 2019 and 2021.

Post-neonatal deaths (deaths between 8 and 365 days of life), however, do not seem to explain the trend in IMR. For instance, while neonatal mortality (3.9 vs 3.2 deaths per 1000 live births) and infant mortality (6.3 and 6.2) rates both decreased between 2020 and 2021, post-neonatal mortality rate (2.4 and 3.0 deaths per 1000 live births) increased between the same period.

Figure 16: Neonatal, Post-neonatal, & Infant Mortality Rates, Tennessee, 2017-2021

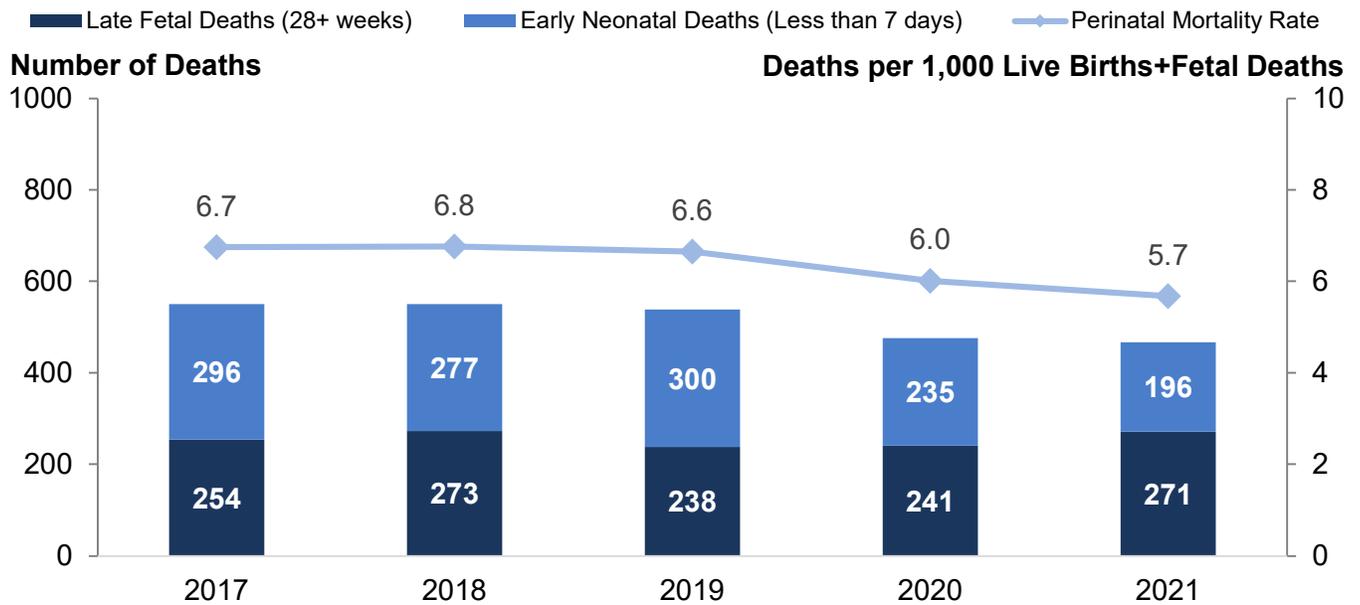


Data Source: Tennessee Department of Health, Division of Vital Records and Health Statistics, Birth and Death Statistical Files, 2017-2021

Perinatal Mortality

Similarly, the perinatal mortality (a measure of late fetal deaths and early neonatal deaths) does not completely describe the decreasing rate of infant mortality in Tennessee. **Between 2019 and 2021**, there was **a decrease in the number of early neonatal deaths** (deaths among infants aged 0 to 6 days; 300 vs 196). However, the number of **late fetal deaths** (fetal deaths greater than 28+ weeks) **increased between 2019 and 2021** (238 vs 271).

Figure 17: Perinatal Mortality, Tennessee, 2017-2021



Data Source: Tennessee Department of Health, Division of Vital Records and Health Statistics, Birth and Death Statistical Files, 2017-2021

Sleep-Related Infant Deaths

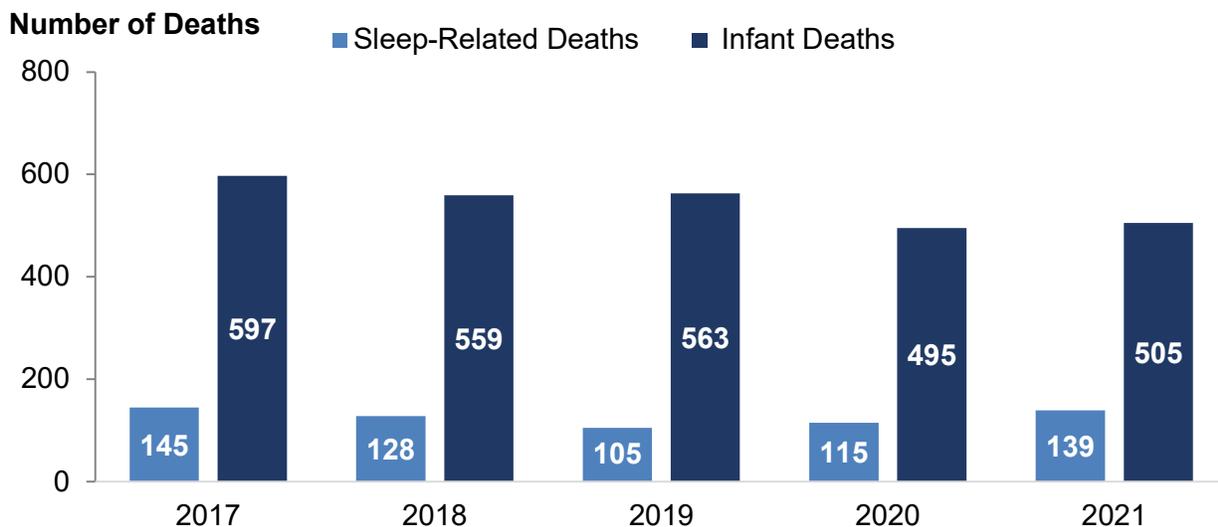
Sleep-related deaths are infant deaths that occur in an unsafe sleep environment. Every year about 3,400 infants in the U.S. die from sleep-related causes. To prevent and reduce the burden of sleep-related deaths, it is important to follow the American Academy of Pediatrics' guidelines for infant safe sleep. Remember the **ABCs of Safe Sleep**. Babies should sleep:

1. **A**lone with no pillows, blankets, crib bumpers, or toys in the sleeping area,
2. On their **B**ack, and
3. In a **C**rib or another approved flat sleeping surface (e.g., bassinet or play pen). Babies should not sleep in a car seat, couch, or on the same bed as an adult.

In the past five years, **sleep-related deaths accounted for over 1 in 5 (23%) of all infant deaths**. TDH continues to promote the **ABCs of Safe Sleep** through multiple prevention initiatives:

- Distributing *Sleep Baby, Safe and Snug* and *Calm Baby, Gently* books to birthing hospitals, CHANT, EBHV, and other community partners.
- Promoting messaging campaigns particularly to parents and communities of infants at greatest risk of sleep-related death.
- Distributing portable cribs through local health departments and community partners to provide a safe sleeping environment for infants.
- Implementing Direct On Scene Education (D.O.S.E) with first responding agencies and housing authorities.

Figure 18: Sleep-Related Infant Deaths, Tennessee, 2017-2021

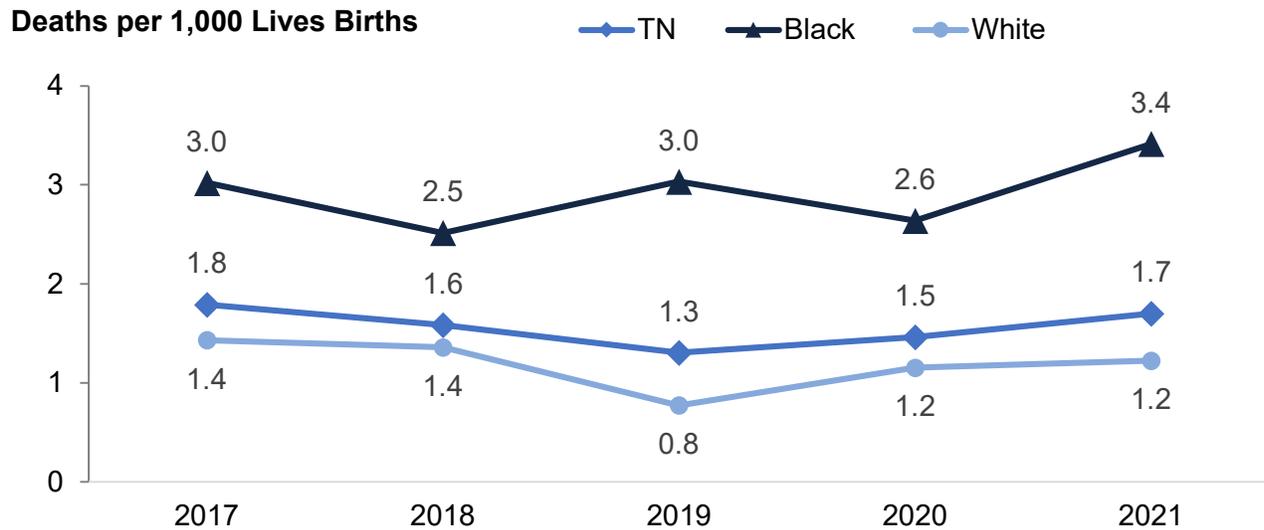


Data sources: Sleep-related infant death counts from Tennessee Department of Health, Child Fatality Review Database System. Total infant deaths from Tennessee Department of Health, Office of Vital Records and Health Statistics, Death Statistical File, 2017-2021.

There is significant and longstanding **racial disparity among sleep-related infant deaths**. While White infants make up most of the sleep-related infant deaths in Tennessee, over the past five years, **Black infants were cumulatively 2-4 times as likely to suffer a sleep-related fatality** as White infants.

The reasons for this persistent disparity are not completely understood and may include socioeconomic factors (e.g., access to prenatal care), difference in prevalence of known risk behaviors (e.g., non-supine infant sleep position, bed-sharing), biological factors (e.g., genetic polymorphisms, metabolic disorders) and other factors (e.g., breastfeeding patterns, exposure to alcohol or tobacco), and health inequities within the healthcare system.

Figure 19: Sleep-Related Death Rates by Race, Tennessee, 2017-2021



Data source: Sleep-related infant death counts from Tennessee Department of Health, Child Fatality Review Database System. Birth data from Tennessee Department of Health, Office of Vital Records and Health Statistics, Birth Statistical File, 2017-2021.

Table 3: Contributing Factors in Sleep-Related Infant Deaths, Tennessee, 2020-2021

Contributing factors	2020	2021
Unsafe bedding or toys in sleeping area**	99	112
Infant found not sleeping in a crib or bassinet	79	96
Infant found sleeping with other people	67	79
Infant found not sleeping on back	64	64
Infant found sleeping with obese adult	17	29
Drug-impaired adult sleeping with infant	8	6
Alcohol-impaired adult sleeping with an infant	3	5
Adult fell asleep while bottle feeding infant	4	4

*Because more than one factor may have contributed to a single death, the total number across the contributing factors exceeds the number of sleep-related infant deaths for a given year.

**Includes comforter, blanket, pillow, bumper pads, toys, plastic bags, and other. Data source: Tennessee Department of Health, Child Fatality Review Database System. Data source: Tennessee Department of Health, Child Fatality Review Database System.

Sudden Death in the Young (SDY) Case Registry Project

The Sudden Death in the Young (SDY) Case Registry gathers information about young people who die suddenly and unexpectedly. All deaths in children up to age 17 are considered for inclusion in the SDY Case Registry, including sudden unexplained infant death (SUID), sudden cardiac death (SCD), and sudden unexpected death in epilepsy (SUDEP), with the following exceptions:

1. Accident in which the external cause was the obvious and only reason for the death, excluding infant suffocation
2. Homicide or Suicide
3. Accidental or intentional overdose of drugs, even if this caused cardiac arrest, when there is no prior history of other possible chronic disease or autopsy findings suggestive of another cause of death
4. Terminal illness in which the death was reasonably expected to occur within six months of death

It has been hard for death investigators to find the causes for many sudden deaths in young people. It has also been challenging for public health agencies to count the actual numbers of these deaths. This means that doctors, scientists, and families do not understand how often these deaths happen and what causes them, making it more difficult to prevent more deaths like these. The SDY Case Registry gathers and stores information about sudden child deaths to help:

- Count the number and types of sudden deaths in babies and children up to age 17
- Try to understand the causes for the deaths
- See if some children are more at risk of dying than others
- Find ways to prevent these deaths

Table 4: Categorization for SDY Case Registry for Children (Ages 0-17 Years), Tennessee, 2021

Categorization for SDY Case Registration	Age		
	< 1 Year*	1-17 Years	Total
Explained infant suffocation	40	0	40
Explained other	7	35	42
Incomplete case info	3	2	5
Unexplained, possible cardiac	4	3	7
Explained cardiac	1	3	4
Unexplained, possible cardiac and SUDEP	0	0	0
Unexplained, SUDEP	0	3	3
Unexplained death	38	4	42
Total	93	50	143

Data source: Tennessee Department of Health, Child Fatality Review Database System.

Table 5: SDY Case Registry Demographic Characteristics, Tennessee, 2017-2021

Age at Death	Number of Deaths	Percentage
< 1 Year	580	63.2%
1-4 Years	96	10.1%
5-9 Years	50	5.5%
10-14 Years	71	7.7%
15-17 Years	122	13.3%
Sex		
Male	568	61.9%
Female	350	38.1%
Race		
Black	353	38.5%
Other	31	3.4%
Unknown	3	0.3%
White	531	57.8%
Total	918	--

Data source: Tennessee Department of Health, Child Fatality Review Database System.

High quality death scene investigation is crucial to assist medical examiners in accurately identifying the cause and manner of death, especially in SUID cases. Thorough DSI also aids in identifying the underlying mechanisms of sleep-related deaths and in categorization of SUID cases.

Table 6: Number of SUID among Death Scene Investigations (DSI) by Year

Year	DSI	Percentage
2017	152	24.2%
2018	118	18.8%
2019	102	16.2%
2020	126	20.1%
2021	130	20.7%
Total	628	--

Data source: Tennessee Department of Health, Child Fatality Review Database System.

Data to Action

Statewide Prevention Activities

In April 2022, the State CFR Team met to review aggregate child death data from 2021 death reviews and to consider recommendations from local teams. State Team members considered recent trends in the causes of child deaths and contemplated strategies for reducing future fatalities. The State Team decided to focus on key strategies for reducing child fatalities in Tennessee, a practice identified during a series of national meetings aimed at strengthening state child fatality reviews.

The State Team made the following recommendations and, in conjunction with colleagues from other state agencies, local child fatality review teams and other community partners, accomplished the following:

Safe Sleep

Increase safe sleep education efforts while targeting outreach in areas with the largest disparities in infant sleep-related deaths.

- TDH continued to collaborate with EBHV and CHANT to distribute the safe sleep diaper bag with materials to educate families and infant caregivers about safe sleep.
- In 2022, TDH and THA continued the *BEST for Babies* award for birthing hospitals. In 2021, 11 facilities earned the award.
- *Sleep Baby, Safe and Snug* board books and other safe sleep educational materials were distributed to new parents prior to their discharge from the hospital.
- Infant sleep sacks were supplied to regional health departments, hospitals and EBHV agencies to distribute to families in need.

Intentional Violence-Homicide/Suicide/Firearm

Increase efforts to address intentional violence.

- In 2022, 865 health and mental health providers completed CALM training.
- TDH, in collaboration with TSPN, offered 406 Gatekeeper training sessions to the community during 2022.
- In 2022, the TDH Suicide Prevention Program expanded ESSENCE surveillance from ages 10 – 17 to include ages 5 – 65+.
- Partners received weekly emails with data and information on where ESSENCE alerts occurred, along with information on key factors associated with the alerts.
- TDH partnered with ETSU to create a website, logo, and application process for TIW.
- TDH pivoted from implementation of *Good Behavior Game* to *Sources of Strength*. Training for schools and community-based organizations began in November 2022.

Motor Vehicle Crashes

Recruit schools to implement evidence-based programs in high fatality and crash counties and continue to promote the proper use of child safety seats and seat belts in youth.

- In 2022, 2 new schools and 3,406 individuals participated in Checkpoints™.
- In 2022, 8 schools participated in Battle of the Belt. The 2022-2023 school year marks the conclusion of Battle of the Belt with TDH.
- TDH continued to fund agencies to purchase and distribute child safety seats.

Conclusion

The goal of child fatality review is to better understand the causes of death of children in Tennessee and to identify strategies for preventing future deaths. The overall 2021 child mortality rate for Tennessee was 60.4 child deaths per 100,000 children, a 6% increase from the 2020 child mortality rate of 57.0 deaths per 100,000 children. **Tennessee's 2021 child fatality rate is 24% above the 2021 national average, leaving important work to be done to protect our children.**

Several key areas identified in this report warrant further attention, as recommended by the State Team. Deaths due to suicide decreased from 2020 to 2021. Despite this decrease, the numbers remain higher, or equal to, the national average and therefore the state team recommends continued education around this topic. **The team recommends continued increased suicide prevention and mental health services.**

Deaths due to homicide, firearms, drowning, sleep-related causes, unintentional asphyxia, and MVC related deaths increased from 2020 to 2021. Several strategies are recommended to reduce drownings, sleep-related deaths, and MVC related deaths, including safe firearm storage, enhanced monitoring of children while around water, safe sleep practices, and implementation of Checkpoints™. Enrollment in programs such as evidence-based home visiting, and care coordination is also recommended to prevent child death.

Appendices

Appendix A—Glossary of Acronyms

Acronym	Meaning
ACEs	Adverse Childhood Experiences
BEST	Breastfeeding, Early elective delivery and Safe sleep for Tennessee babies
CALM	Counseling on Access to Lethal Means
CDC	Centers for Disease Control and Prevention
CDC	
WONDER	CDC's Wide-ranging Online Data for Epidemiologic Research
CFR	Child Fatality Review
CHANT	Community Health Access and Navigation in Tennessee
CHASCO	Coalition for Healthy and Safe Campus Communities
CSP	Comprehensive Suicide Prevention
DCS	Department of Children's Services
DIDD	Department of Intellectual and Developmental Disabilities
DOE	Department of Education
DOSE	Direct On Scene Education
DSI	Death Scene Investigation
EBHV	Evidence-Based Home Visiting
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemic
ETSU	East Tennessee State University
MVC	Motor Vehicle Crash
NCFRP	National Center for Fatality Review and Prevention
PSA	Public Service Announcement
SAVE	Schools Against Violence in Education
SDY	Sudden Death in the Young
SOS	Sources of Strength
SUDEP	Sudden Unexpected Death in Epilepsy
SUID	Sudden Unexpected Infant Death
TBI	Tennessee Bureau of Investigation
TCAPES	Tennessee Child and Adolescent Education and Support
TCCY	The Commission on Children and Youth
TDH	Tennessee Department of Health
TDMHSAS	Tennessee Department of Mental Health and Substance Abuse Services
THA	Tennessee Hospital Association
TIW	Trauma Informed Workplace
TSPN	Tennessee Suicide Prevention Network

Appendix B—List of Tables and Figures

Tables

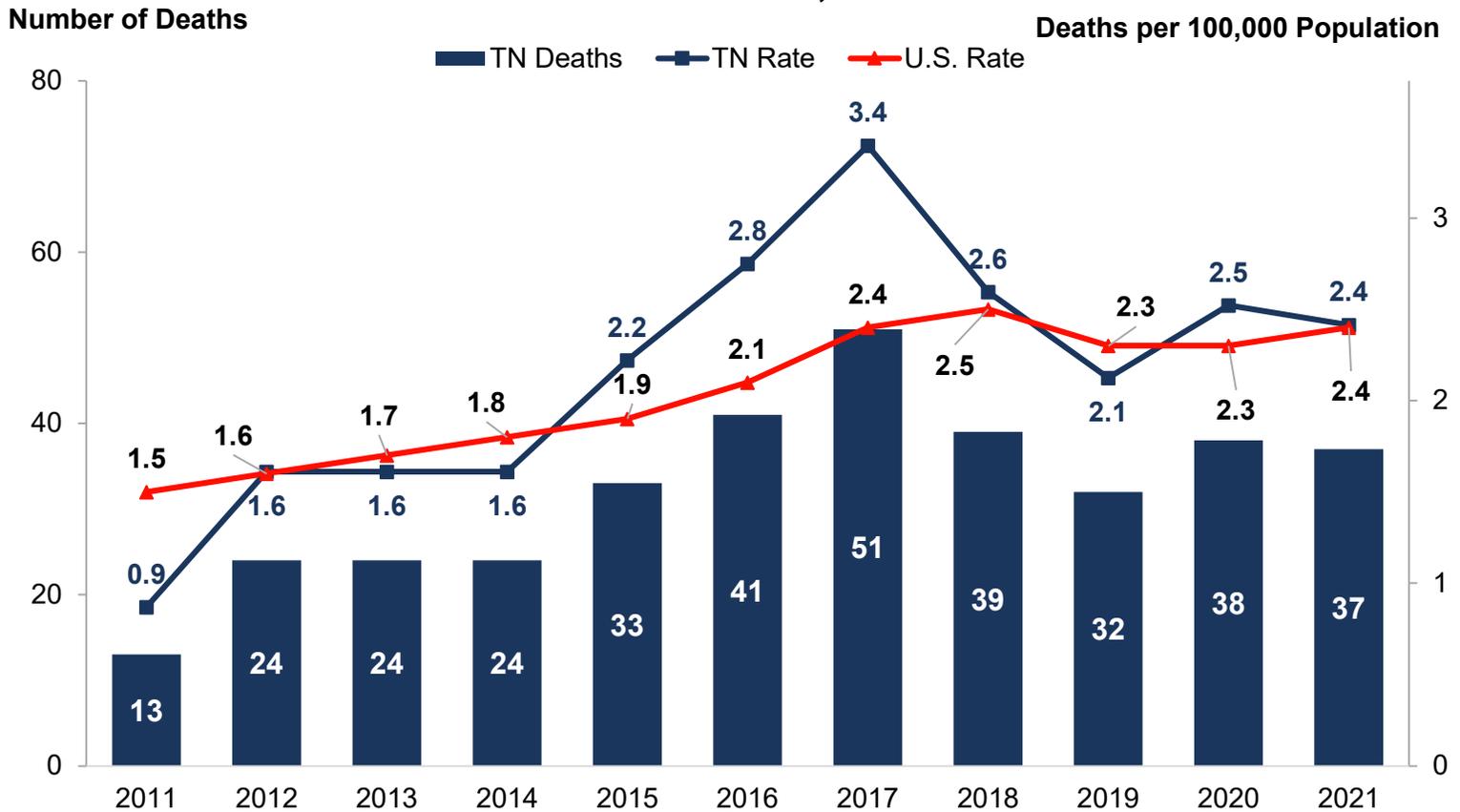
- Table 1 Risk Factors Associated with Infant Deaths Reviewed by Tennessee CFR Teams, 2021
- Table 2 Leading Causes of 2021 Infant Deaths: TN vs U.S.
- Table 3 Contributing Factors in Sleep-Related Infant Deaths, Tennessee, 2020-2021
- Table 4 Categorization for SDY Case Registry for Children (Ages 0-17 Years), Tennessee, 2021
- Table 5 SDY Case Registry Demographic Characteristics, Tennessee, 2017-2021
- Table 6 Number of SUID among Death Scene Investigations (DSI) by Year

Figures

- Figure 1 Number and Rate of Child Deaths (Ages 0-17 Years) Tennessee, 2017-2021
- Figure 2 More than Half of All Child Deaths Reviewed were <1 Year of Age Tennessee, 2021
- Figure 3 Child Deaths by Race
- Figure 4 Child Deaths by Sex
- Figure 5 Almost Half of All Child Deaths (Ages 0-17 Years) in Tennessee were by Natural Means, 2021
- Figure 6 Half of All Deaths in Children (Ages 0-17 Years) were Caused by a Medical Condition, Tennessee, 2021
- Figure 7 Homicide Deaths and Rates per 100,000 Population (Ages 0-17 Years), Tennessee and US, 2017-2021
- Figure 8 Suicides and Suicide Rates per 100,000 Children (Ages 0-17 Years), Tennessee and US, 2017-2021
- Figure 9 Firearm-Related Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee, 2017-2021
- Figure 10 Motor Vehicle and Other Transport-Related Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee, 2017-2021
- Figure 11 Drowning Deaths and Rates per 100,000 Children (Ages 0-17 Years), Tennessee and US, 2017-2021
- Figure 12 Fire/Burn-Related Deaths in Children (Ages 0-17 Years), Tennessee, 2017-2021
- Figure 13 Fall-Related Deaths in Children (Ages 0-17 Years), Tennessee, 2017-2021
- Figure 14 Deaths due to Poisoning in Children (Ages 0-17 Years), Tennessee, 2017-2021
- Figure 15 Number and Rate of Infant Deaths in Tennessee, 2017-2021
- Figure 16 Neonatal, Post-neonatal, & Infant Mortality Rates, Tennessee, 2017-2021
- Figure 17 Perinatal Mortality, Tennessee, 2017-2021
- Figure 18 Sleep-Related Infant Deaths, Tennessee, 2017-2021
- Figure 19 Sleep-Related Death Rates by Race, Tennessee, 2017-2021

Appendix C— Trend of Suicide Among Tennessee Children (Ages 0-17), 2011-2021

Suicides and Suicide Rates per 100,000 Children Ages 0-17 Years, Tennessee and the US, 2011-2021



Data Source: Tennessee Department of Health, Child Fatality Review Database System. Tennessee Department of Health, Office of Vital Records and Health Statistics, Death Statistical File

Suicides among Tennessee Children in 2017

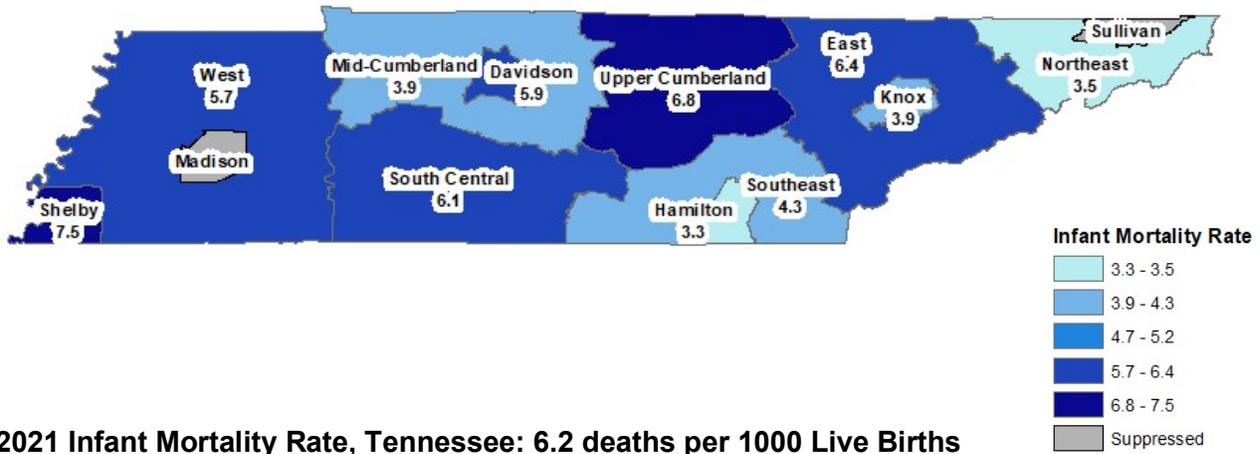
Deaths by suicide was abnormally high in 2017. Our review of the case narratives did not reveal any compelling trend behind the higher number of suicides in 2017 compared to other years. There was no reference to a suicide pact or other shared risk factors in 2017 suicides. Most of the deaths by suicide occurred after an argument with parents or a romantic partner, a common risk factor for suicide.

Breakdown of Demographic Characteristics of Suicide Decedents over the past 10 years

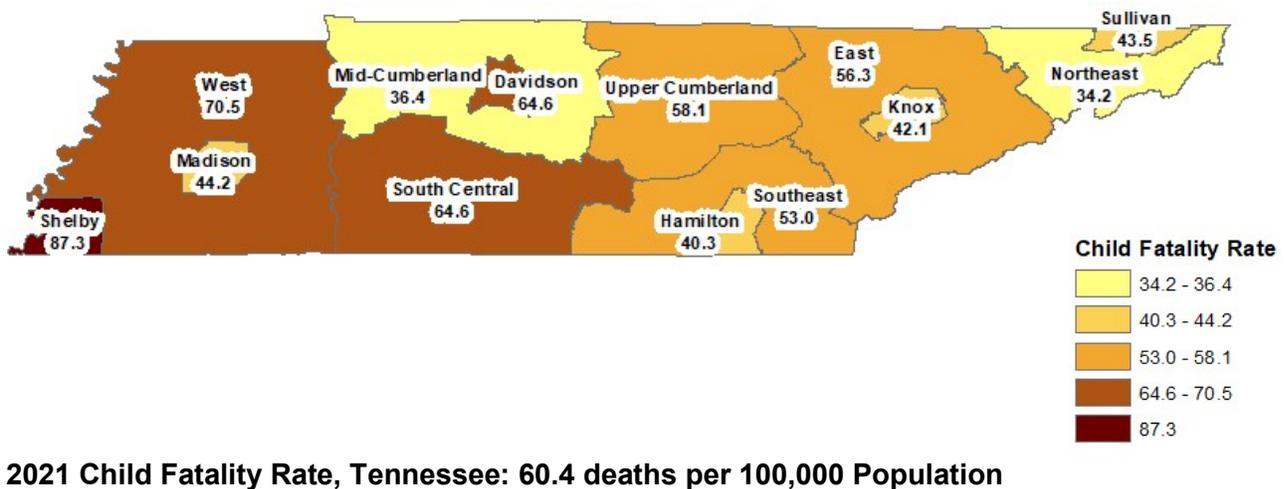
- The proportion of male decedents was higher than female decedents. In 2013, 2017, and 2021, the number of male decedents was at least **4x higher** than female decedents.
 - This observation is congruent with state- and national-level data where male suicide decedents at least 3x higher than female decedents. There is no apparent increase in the burden of suicide in teen girls over the past decade; male teens still bear the burden of suicides.
- White children are more represented in Tennessee's population than any other race. Nonetheless, the rate of suicide among White children is 2x higher than Black children.
- Over the past decade, the proportion of suicides has been consistently higher among teens aged 15-17 years than teens aged 10 to 14 years.

Appendix D— Infant and Child Deaths by Region of Residence

Infant Mortality Rate across Tennessee's Health Regions



Child Fatality Rate across Tennessee's Health Regions



Appendix E—Success Stories

Safe Sleep Public Service Announcements: Educating Multi-Generational Households

A safe sleep educational awareness video was created to distribute to health departments, healthcare providers and media outlets. Safe sleep can be particularly challenging to address in multi-generational households as the recommendations have changed over the years.

Tennessee Department of Health also develop two Safe Sleep PSAs with the help of a professional production team who hired actors. Department personnel ensured that all sleep environments in the PSAs and scripts adhered to the most recent American Academy of Pediatrics' Safe Sleep Guidelines. PSAs were also produced with Spanish subtitles.

Data was utilized to identify the areas with the highest rate of sleep-related deaths along with areas having the largest disparity to determine where to broadcast the PSAs. PSAs were aired on local television channels in the Davidson County and Shelby County viewing areas in both daytime and prime time televisions commercial slots. The English and Spanish version of both PSAs are available on the program website, www.tinyurl.com/health-safe-sleep-media, for public use and dissemination.



PSA 1: *Infant Safe Sleep Tips for Grandpa*

Grandma <https://www.youtube.com/watch?v=AWBpeC5B1Pk>



PSA 2: *Infant Safe Sleep Tips for*

Grandma <https://www.youtube.com/watch?v=AWBpeC5B1Pk>

Improving the Tennessee Workforce: Creating a Trauma Informed Workplace (TIW) Designation

The Tennessee Trauma Informed Workplace (TIW) designation strives to create workplaces that implement policy and practices to realize the impact of trauma; recognize the signs and symptoms of trauma in employees, consumers, and others; respond to trauma via evidence-informed policies and practices to avoid re-traumatization of employees and consumers due to Adverse Childhood Experiences (ACEs). TDH contracted with East Tennessee State University: Building Strong Brains to develop a TIW designation to reduce workplace trauma. ETSU staff and partners developed a diverse, multi-disciplinary TIW Stakeholder Group who then reviewed policies and best practices for a TIW framework. A website, logo, and TIW application process was developed, and TIW recruitment was initiated. The long-term goal of the program is to recognize 15 workplaces annually and measure process, impact, and outcome data that will inform a peer-reviewed journal article to contribute to the field of injury and ACEs prevention and mitigation.



Suicide Prevention: Utilizing Data to Focus Efforts



Suicide is a serious public health issue and an immeasurable tragedy for surviving families, friends, and communities. Suicide is the second leading cause of death for ages 10-19. According to one estimate, approximately 135 people are affected by each suicide death.

The Tennessee Department of Health Suicide Prevention Program uses a public health approach to monitor weekly trends

in suicide-related behavior in children aged 17 years old and younger. Weekly surveillance data from emergency room visits for a suicide attempt, intentional self-harm, or thoughts of suicide are collected by the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE) software. In 2022, the TDH Suicide Prevention Program expanded surveillance to include ages 5-10 in response to the increasing number of children visiting hospital emergency rooms for suicide-related behaviors.

ESSENCE data is used to identify counties across the state seeing increased incidents of youth reporting to an emergency department for suicide-related behavior. If a certain county reports an above-average number of suicide-related emergency department visits, an ESSENCE alert bulletin is triggered for that county. This weekly alert data bulletin notifies community partners about the increase in suicide-related behavior in their area, any trends in demographics that were noticed, and the risk factors noted during reported visits. In addition, a rapid response plan refers individuals to prevention support, guidelines, resources, and trainings within a county seeing increases in near real time. Currently, more than 225 subscribers across the state receive ESSENCE alert bulletins weekly.

Partners include, but are not limited to, the Tennessee Suicide Prevention Network, Tennessee Department of Mental Health and Substance Abuse Services, The Jason Foundation, Centerstone, CHASCO, BlueCare TN, Tennessee Coordinated School Health, Tennessee Department of Education, and Youth Villages.

Statement of Compliance with 2012 Tenn. Pub. Acts, ch. 1061 (the “Eligibility Verification for Entitlements Act”) as required by Tenn. Code Ann. § 4-57-106(b)

None of the Department’s activities relative to the Child Fatality Review Teams involve the provision of services to individuals who are subject to the SAVE Act.



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