Child Mortality

Pennsylvania, 2013-2022

Pennsylvania Department of Health

Key Findings

- **The child mortality rate in Pennsylvania has increased since 2013. The rate increased by 20% between 2019 and 2021 — during this period there were on average 3 additional deaths per 100,000 per year among youth aged 1 to 21 years.**
- **Injuries are the leading cause of death among children aged 1 to 21 years. Firearms are the leading cause of injury-related deaths.**
- **Black children had the highest rate of mortality for the last ten years and the rate for this group increased in 2020 and was elevated through 2022. This increase can be attributed to an uptick in firearm injury deaths. Most additional firearm injury deaths among Black children were homicides and occurred among youth aged 16 to 21 years. Additionally, over 50% of the firearm injury deaths among Black children were among residents of Philadelphia County.**
- **Most injury-related deaths are preventable. Addressing common mechanisms of injury-related death and systemic environmental and social inequities may result in fewer child lives lost in Pennsylvania.**

Data Brief

• What is child mortality?

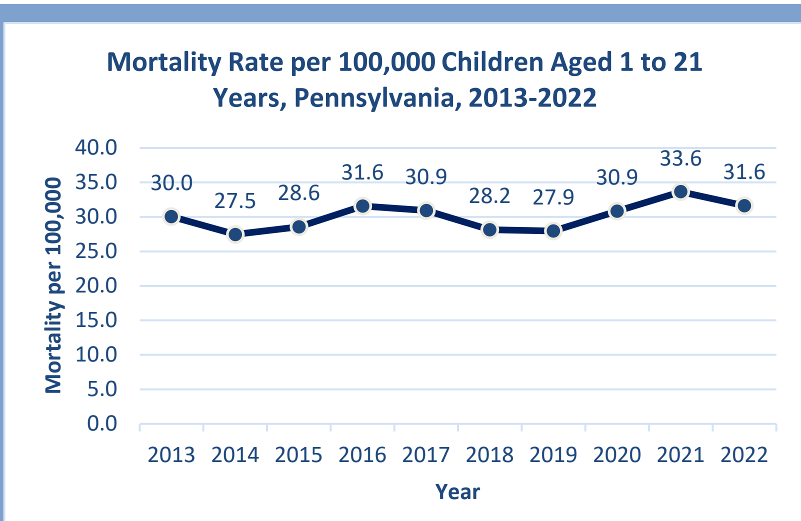
Child mortality is death occurring among children. For this data brief, we define children as youth between the ages of 1 and 21 years. The child mortality rate is considered an important marker of health for a community, state, or country.

• How many children die in Pennsylvania each year?

On average, over 900 children died each year in Pennsylvania over the last 10 years from 2013 to 2022.

• How has the child mortality rate changed over the last 10 years?

The mortality rate is defined as the number of child deaths divided by the total population of children in the state between the ages of 1 and 21 years multiplied by a constant, 100,000, to help with interpretation. The child mortality rate has fluctuated over the last 10 years and increased significantly by 20% between 2019 and 2021. Between 2019 and 2021 there were on average 3 additional child deaths per 100,000 per year. A similar increase was observed nationally. While the overall mortality rate decreased from 33.6 in 2021 to 31.6 deaths per 100,000 in 2022, this decrease was not statistically significant. Additional years of data are needed to determine if this is the start of a decreasing trend.



The child mortality rate significantly increased by 20% between 2019 and 2021. On average, there were 3 additional deaths per 100,000 per year during this period.

The mortality rate decreased from 33.6 deaths per 100,000 in 2021 to 31.6 in 2022.

Pennsylvania Department of Health

- ## What is the leading cause of child mortality in Pennsylvania?

Injury is the leading cause of death among children ages 1 to 21 years. Other common causes of child death are cancer and birth defects. Injury-related deaths have accounted for over 60% of all child deaths in Pennsylvania for the last ten years from 2013 to 2022. Most injury-related child deaths are preventable. There are different types, or mechanisms, of injury-related death.

- ## What are the top five mechanisms of injury-related deaths in Pennsylvania?

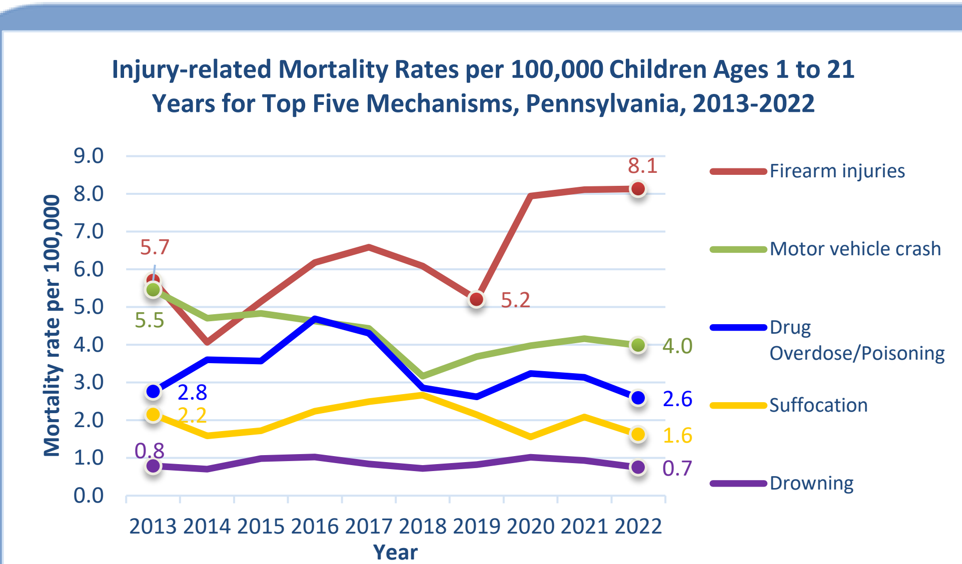
The top five mechanisms of injury-related deaths in Pennsylvania are firearm injuries, motor vehicle crash fatalities, drug-related deaths, suffocation deaths, and drowning. Each mechanism is further explained in the table below.

Leading Mechanisms of Injury-related Child Deaths, 2013-2022

1.	Firearm Injuries	Fatalities that result from firearm injuries are those caused by discharge of a handgun or long-gun, including a rifle, shotgun, or larger firearm.
2.	Motor vehicle crashes	Deaths due to motor vehicle crashes include those involving drivers or passengers of a car, bus, truck, motorcycle, or other transport vehicle. This includes crashes involving a car and a pedestrian or cyclist.
3.	Drug-related deaths	Drug-related deaths include those resulting from ingestion or overdose of a drug or medication.
4.	Suffocation	Suffocation deaths include accidental strangulation or obstruction of the airway as well as intentional self-harm by hanging and/or intentional violence.
5.	Drowning	Deaths due to drowning are those that result from submersion or downing in a body of water such as a bathtub, swimming pool, or body of water like a lake, pond, or ocean.

- ## How have the mechanisms of injury-related child deaths changed over time?

In 2013, motor vehicle crashes and firearm injuries were equally common leading mechanisms of injury-related death among children ages 1 to 21 years. Since then, the motor vehicle crash mortality rate decreased while the rate of firearm injury mortality increased significantly. The drastic increase in firearm-related deaths observed since 2020 has contributed to the overall increase in mortality that was observed in Pennsylvania among children ages 1 to 21 years.



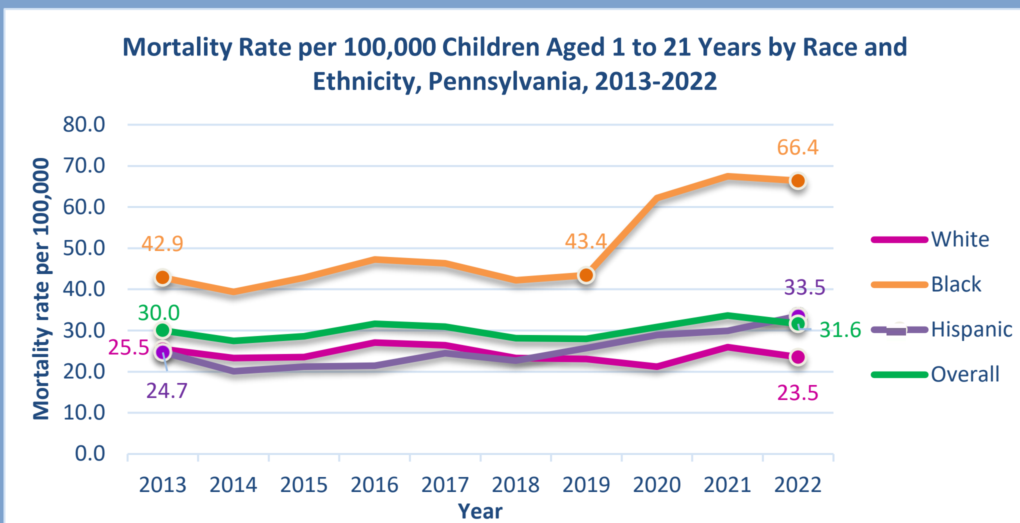
In 2013, motor vehicle crashes and firearm injuries were equally common mechanisms of injury-related deaths among children.

Since then, motor vehicle crash mortality rates declined and firearm mortality rates increased.

Firearm injuries were the leading mechanism of injury-related deaths among children in 2022.

- ## How do child mortality rates differ by race?

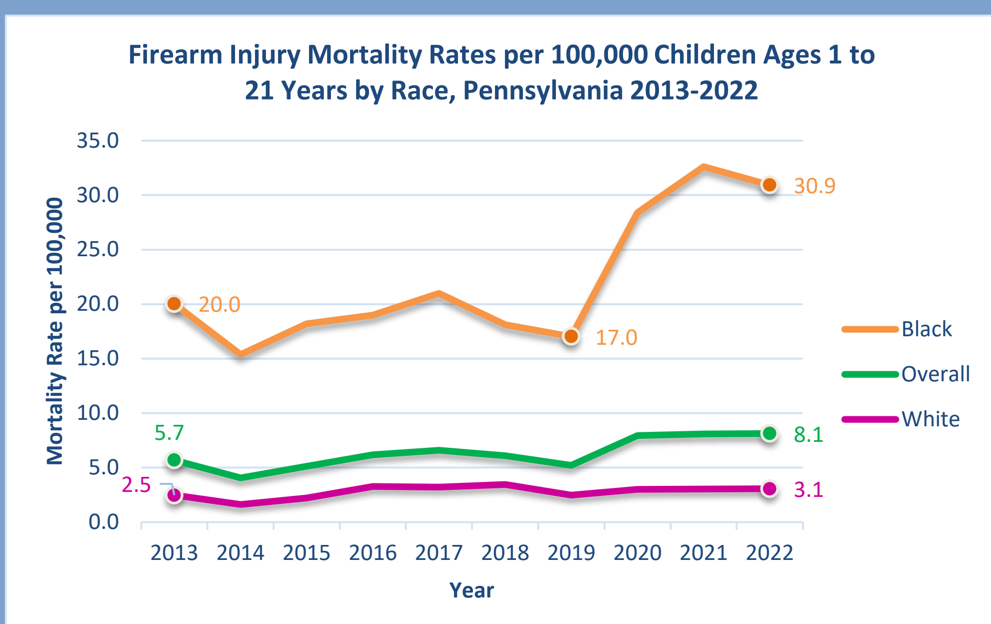
Black youth have been more likely to die during childhood, compared to children of another race or ethnicity, for the last decade in Pennsylvania. The mortality rate was nearly two times higher among Black children ages 1 to 21 years from 2013 to 2019. From 2020 to 2022, the racial disparity widened, and the mortality rate was nearly three times higher among Black children ages 1 to 21 years than white children per 100,000 in 2022.



Black children were two to three times more likely to die during childhood than children of another race or ethnicity.

- ## What contributed to the observed increase in the mortality rate among Black children beginning in 2020?

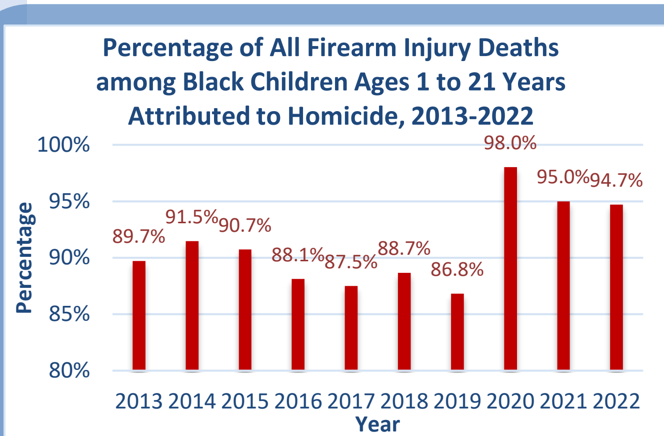
An increase in firearm injury deaths among Black children in 2020 contributed to the observed increase in the overall mortality rate. The firearm injury mortality rate among Black children significantly increased from 17.0 deaths per 100,000 children ages 1 to 21 years in 2019 to 28.4 in 2020 and has remained high since then.

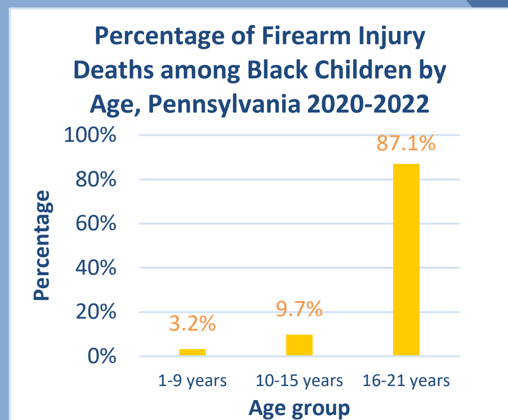


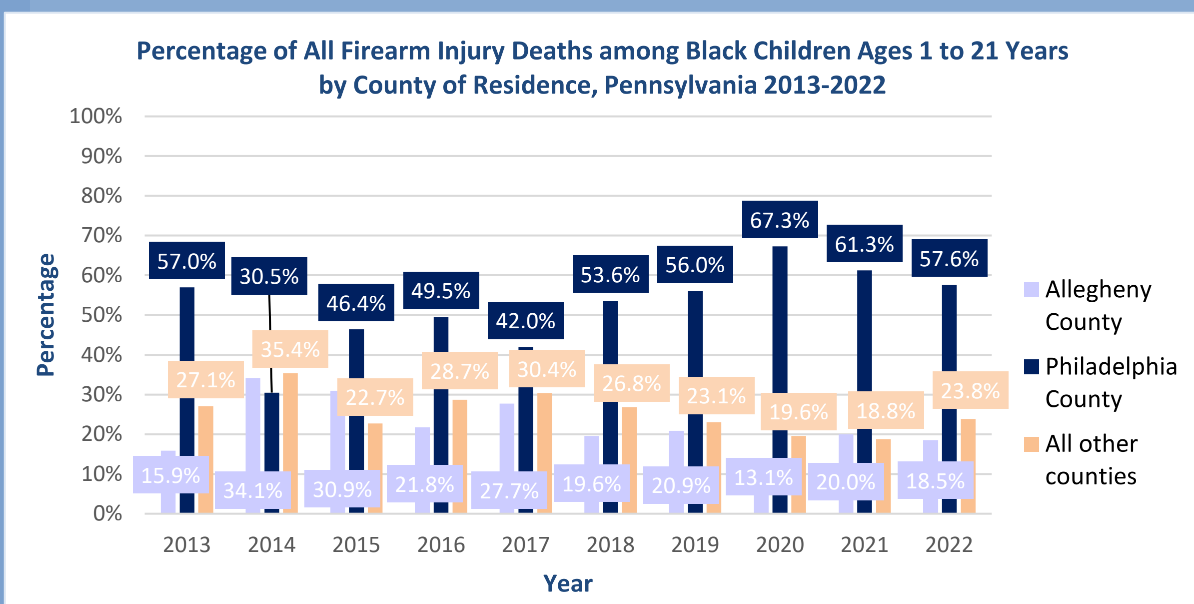
An increase in firearm injury deaths among Black children contributed to the uptick in the mortality rate observed beginning in 2020.

- ## What more do we know about the additional firearm injury deaths that occurred among Black children between 2020 and 2022?

Over 90% of the firearm injury deaths that occurred among Black children between 2020 and 2022 were homicides and more than 60% of the firearm deaths occurred among residents of Philadelphia County. Over 80% of all firearm injury deaths occurred among Black youth between the ages of 16 and 21 years between 2020 and 2022.







Most firearm injury deaths occurring between 2020 and 2022 were homicides.

Over 80% of firearm injury deaths among Black children from 2020 to 2022 occurred among youth aged 16 to 21 years.

Over 50% of firearm injury deaths occurring between 2020 and 2022 occurred among youths in Philadelphia County.

- ## What other factors contribute to child health outcomes?

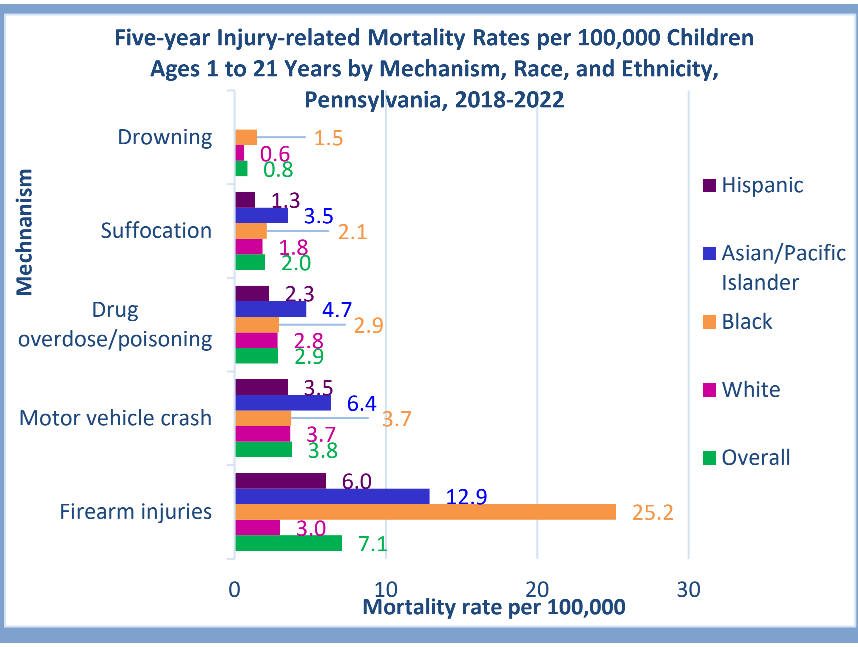
The conditions in the environments where people are born, live, learn, work, play, worship, and age impact quality-of-life and overall health for infants and their families.[5] Social, environmental, and economic inequities, including exposure to systemic racism and other forms of oppression, have a greater impact on health than individual choices or behaviors. These factors and experiences impact a person's health throughout life and can result in trauma that impacts health across generations.

Communities and groups that have experienced historic and ongoing discrimination often experience a higher burden of poor health outcomes as compared to others. These differences are the result of systematic, unfair, and unjust circumstances which must be identified and addressed for all to attain wellness.

• Why are mortality rates higher among Black children?

Differences in mortality rates by race have been attributed to environmental and social inequities that exist because of structural racism and bias.[1] Prior research suggests that disproportionate exposure to poverty, neighborhood violence,[2] as well as elevated incidence of injury[3] and injury mortality[4] among Black children may also contribute to this disparity.

When looking at injury-related mortality rates by both race and mechanism for the most recent five-year period (2018-2022), the leading cause of death among Black children was firearm injury.



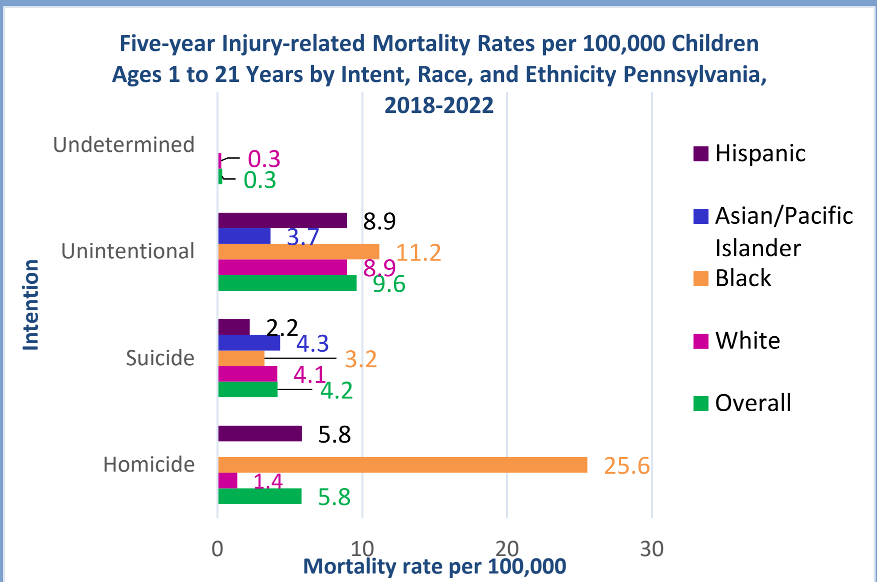
Race and ethnicity are social constructs, not biological. Differences by race and ethnicity are the result of environmental and social inequities.

Injury-related mortality rates are highest among Black children in Pennsylvania.

The leading mechanism of mortality among Black children during 2018-2022 was firearm injury.

• How do injury-related mortality rates differ by race, ethnicity, and intent?

When looking at data from the most recent five-year period (2018-2022) by race, ethnicity, and intent, the most likely cause of death among white children was unintentional injury and the most likely cause of death among Asian/ Pacific Islander children was suicide. The most common cause of death among Hispanic children was unintentional injury followed by homicide. Among Black children, the most likely cause of death was homicide, followed by unintentional injury. Notably, there is a stark racial difference in the homicide rate among Black children as the rate of homicide was 18 times higher among Black children than among white children during 2018-2022.



During 2018-2022 most deaths among Black children were homicides. Homicide is death caused by an intentional act committed by another person.

Unintentional injury deaths were most common among Hispanic and white children. Unintentional injury deaths result from an injury that was not caused on purpose.

Suicide death was most common among Asian and Pacific Islander children. Suicide is death resulting from an intentional self-inflicted act.

Additional Data

Child Death Review

In Pennsylvania local Child Death Review (CDR) teams review deaths among children ages 21 and under in accordance with Act 87 of 2008. The goal of local CDR teams is to gather and examine data regarding the circumstances surrounding child deaths and to make recommendations regarding prevention activities to reduce injury and death of children and youth from birth through age 21 years. Summarized findings from reviewed deaths and related recommendations by year of death are presented in annual reports found on the Department of Health's website.

Technical Notes

Data Sources and Method

This data brief presents child mortality statistics based on data from Pennsylvania's 2013-2022 occurrent death certificate files. Child mortality rates for youth ages 1 to 21 years are described over time, by cause, mechanism, and intent of death as well as by race and ethnicity. Mortality rates by race were calculated using single-race categories available from the death certificate. Infant deaths were not included in this brief as most causes of death are unique to the perinatal period or conditions of early life and are not applicable to older age groups. Infant mortality data and rates can be found in a separate infant mortality brief available on the Department of Health's website.

Population Data

The population estimates used to calculate mortality rates for children ages 1 to 21 are U.S. Census Bureau estimates of state resident populations available from the US Centers for Disease Control and Prevention (CDC) Wide-Ranging Online Data for Epidemiologic Research (WONDER) database. Citations for the presented data can be found in the references.[6,7] Per CDC WONDER, population figures from 2013 to 2020 are from the corresponding years' Vintage postcensal series released annually by the National Center for Health Statistics. Population figures by race from 2013 to 2020 are bridged-race estimates.[6] The population data for 2021 are single-race estimates of the July 1 resident population, based on the Blended Base produced by the US Census Bureau in lieu of the April 1, 2020, decennial population count, from the Vintage 2021 postcensal series released by the Census Bureau on June 30, 2022.

The Modified Blended Base consists of the blend of Vintage 2020 postcensal population estimates for April 1, 2020, 2020 Demographic Analysis Estimates, and 2020 Census data from the internal Census Edited File (CEF). The population figures for years 2022 and later are single-race estimates of the July 1 resident population, from the Vintage 2022 postcensal series released by the Census Bureau on June 22, 2023. The 2022 series is based on the Modified Blended Base produced by the US Census Bureau in lieu of the April 1, 2020 decennial population count.[7] The following caveat described by CDC WONDER is also applicable to the data presented in this brief, "Information included on the death certificate about the race and Hispanic ethnicity of the decedent is reported by the funeral director as provided by an informant, often the surviving next of kin, or, in the absence of an informant, on the basis of observation. Race and ethnicity information from the census is by self-report. To the extent that race and Hispanic origin are inconsistent between these two data sources, death rates will be biased."[6,7]

Data Suppression

It was not possible to present death data for all populations or subgroups of interest due to small numbers. Mortality rates calculated based on fewer than 10 deaths are considered unstable and are more likely to vary widely from year to year. Accordingly, rates based on few vital events were suppressed, and it was not possible to assess mortality rates by cause and intent for all racial and ethnic groups. Where possible, we aggregated annual data to a five-year period to allow for presentation of data for more of the child population.

Leading Cause of Death

The causes of death identified in this brief were characterized using the underlying cause of death International Classification of Diseases, Tenth Revision (ICD-10) code on the death certificate. The ICD-10 is a standardized system used to code and classify causes of death. Death certificates may misclassify causes of death as cause of death determination practices differ by certifier.

References

[1] Pressley, J. C., Barlow, B., Kendig, T., & Paneth-Pollak, R. (2007). Twenty-year trends in fatal injuries to very young children: the persistence of racial disparities. Pediatrics, 119(4), e875- e884.

[2] Rogers, R. G., Lawrence, E. M., Hummer, R. A., & Tilstra, A. M. (2017). Racial/ethnic differences in early-life mortality in the United States. Biodemography and social biology, 63(3), 189-205.

[3] Ballesteros, M. F., Williams, D. D., Mack, K. A., Simon, T. R., & Sleet, D. A. (2018). The epidemiology of unintentional and violence-related injury morbidity and mortality among children and adolescents in the United States. International journal of environmental research and public health, 15(4), 616.

[4]Jeffries, K., Puls, H. T., Hall, M., Bettenhausen, J. L., Markham, J. L., Synhorst, D. C., & Dowd, M. D. (2022). Racial and ethnic differences in pediatric unintentional injuries requiring hospitalization. Journal of hospital medicine, 17(1), 19-27.

[5]Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved [September 25, 2024], from https://health.gov/healthypeople/ objectives-and-data/social-determinants-health

[6]Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 1999-2020 on CDC WONDER Online Database, released in 2021. Data are from the Multiple Cause of Death Files, 1999-2020, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http:// wonder.cdc.gov/ucd-icd10.html on Oct 17, 2024

[7] Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 2018-2022 on CDC WONDER Online Database, released in 2024. Data are from the Multiple Cause of Death Files, 2018-2022, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http:// wonder.cdc.gov/ucd-icd10-expanded.html on Oct 17, 2024

Questions?

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