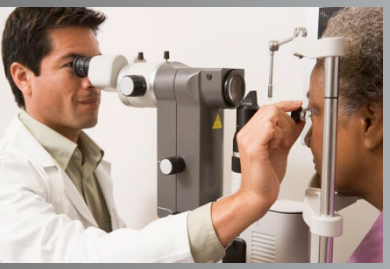
# Dive into Data: Trends, Access, and Review Integration

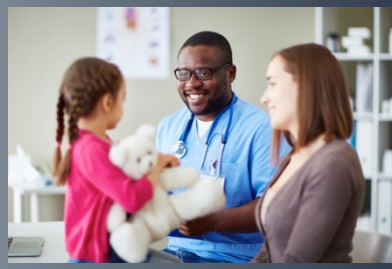
Breakout session #4

Child Fatality Prevention System Summit

March 30, 2022







NC Department of Health and Human Services

# A Deep Dive into Child Death Data

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**Perinatal Epidemiologist**
**Division of Public Health, Title V Office**

**March 30, 2023**

# Trends in Infant & Child Death Rates

# Infant Mortality Rates declined 38% since the Child Fatality Task Force & Prevention System were established in 1991

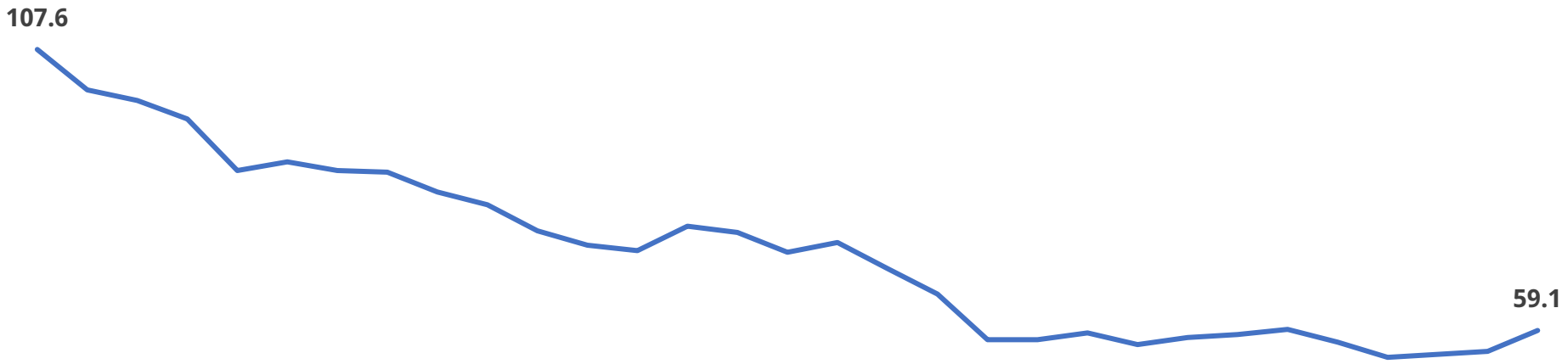
*Infant Deaths per 1,000 Live Births, North Carolina Residents 1991-2021*


| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rate | 10.9 | 9.9 | 10.6 | 10.0 | 9.2 | 9.2 | 9.2 | 9.3 | 9.1 | 8.6 | 8.5 | 8.2 | 8.2 | 8.8 | 8.8 | 8.1 | 8.5 | 8.2 | 7.9 | 7.0 | 7.2 | 7.4 | 7.0 | 7.1 | 7.3 | 7.2 | 7.1 | 6.8 | 6.8 | 6.9 | 6.8 |

**Source: NC State Center for Health Statistics**

# Child Death Rates declined 45% since the Child Fatality Task Force & Prevention System were established in 1991

***Child Deaths per 100,000 Children Ages 0 to 17, North Carolina Residents 1991-2021***




| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rate | 107.6 | 100.6 | 98.8 | 95.6 | 86.7 | 88.2 | 86.7 | 86.4 | 83.0 | 80.8 | 76.3 | 73.8 | 72.9 | 77.1 | 76.0 | 72.6 | 74.3 | 69.8 | 65.4 | 57.5 | 57.5 | 58.7 | 56.7 | 57.9 | 58.4 | 59.3 | 57.1 | 54.5 | 55.0 | 55.5 | 59.1 |

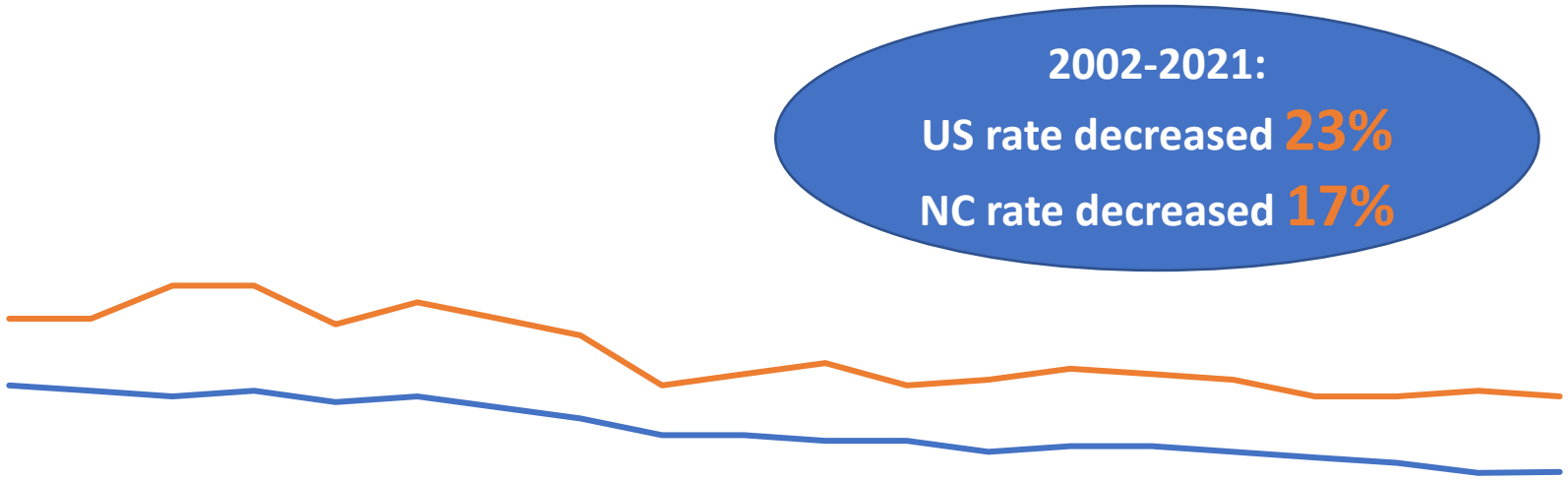
**Source: NC State Center for Health Statistics**

# 1,360 Child Deaths = 76 classrooms of children lost in North Carolina in 2021


**** Estimated 18 children per class:*** https://www.ncleg.net/enactedlegislation/statutes/pdf/bysection/chapter_115c/gs_115c-301.pdf

# North Carolina infant mortality rates are consistently higher than US rates and have declined at a slower pace

*Infant deaths per 1,000 live births: US & NC 2002-2021*



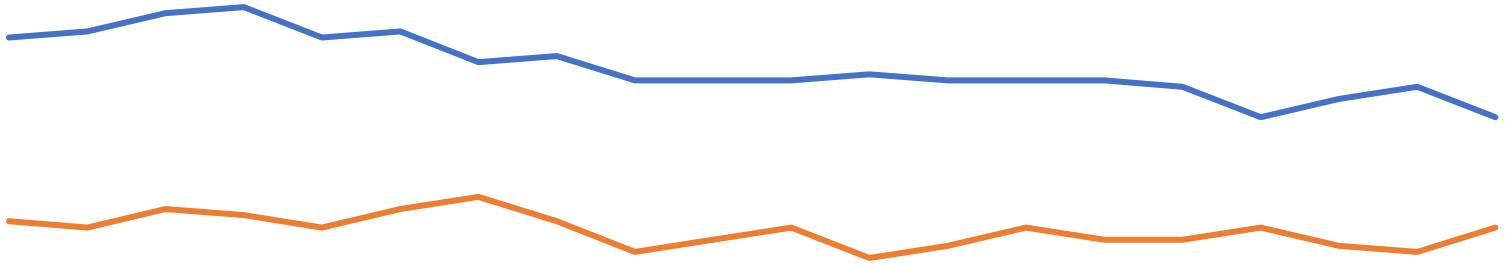

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U.S. | 7.0 | 6.9 | 6.8 | 6.9 | 6.7 | 6.8 | 6.6 | 6.4 | 6.1 | 6.1 | 6.0 | 6.0 | 5.8 | 5.9 | 5.9 | 5.8 | 5.7 | 5.6 | 5.4 | 5.4 |
| N.C. | 8.2 | 8.2 | 8.8 | 8.8 | 8.1 | 8.5 | 8.2 | 7.9 | 7.0 | 7.2 | 7.4 | 7.0 | 7.1 | 7.3 | 7.2 | 7.1 | 6.8 | 6.8 | 6.9 | 6.8 |

**Source: NC State Center for Health Statistics & CDC/National Center for Health Statistics**

# North Carolina's neonatal death rates are decreasing at a faster pace than postneonatal death rates

*Neonatal & Postneonatal* Mortality Rates, NC Residents 2002-2021*

**2002 to 2021:**
**Neonatal decreased 23%**
**Postneonatal decreased 4%**



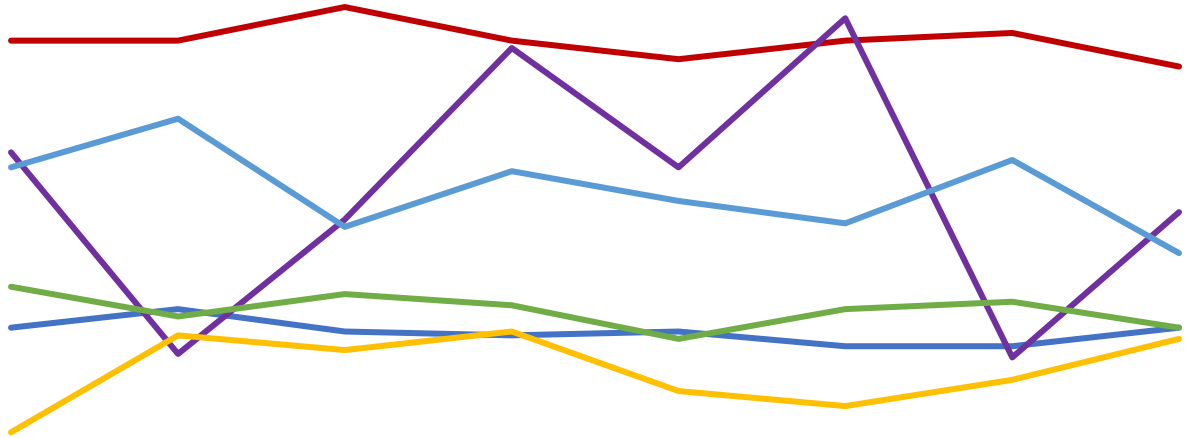
| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Neonatal | 5.6 | 5.7 | 6.0 | 6.1 | 5.6 | 5.7 | 5.2 | 5.3 | 4.9 | 4.9 | 4.9 | 5.0 | 4.9 | 4.9 | 4.9 | 4.8 | 4.3 | 4.6 | 4.8 | 4.3 |
| Postneonatal | 2.6 | 2.5 | 2.8 | 2.7 | 2.5 | 2.8 | 3.0 | 2.6 | 2.1 | 2.3 | 2.5 | 2.0 | 2.2 | 2.5 | 2.3 | 2.3 | 2.5 | 2.2 | 2.1 | 2.5 |

**Source: NC State Center for Health Statistics**

** Neonatal=< 28 days Postneonatal= >=28 days*

# Infant mortality rates are higher among North Carolina's NH Black, NH American Indian, & Multi-racial populations

***Infant Death Rates by Race/Ethnicity, NC Residents 2014-2021***



| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| NH White, single race | 5.1 | 5.6 | 5.0 | 4.9 | 5.0 | 4.6 | 4.6 | 5.1 |
| NH Black, single race | 12.8 | 12.8 | 13.7 | 12.8 | 12.3 | 12.8 | 13.0 | 12.1 |
| NH Am. Ind., single race | 9.8 | 4.4* | 8.0 | 12.6 | 9.4 | 13.4 | 4.3* | 8.2 |
| NH Asian/PI, single race | 2.3 | 4.9 | 4.5 | 5.0 | 3.4 | 3.0 | 3.7 | 4.8 |
| NH Multiracial | 9.4 | 10.7 | 7.8 | 9.3 | 8.5 | 7.9 | 9.6 | 7.1 |
| Hispanic | 6.2 | 5.4 | 6.0 | 5.7 | 4.8 | 5.6 | 5.8 | 5.1 |

** Rates with an asterisk are based on a small number of deaths (< 10 deaths) and may be statistically unreliable – interpret with caution.*
*Caution: Racial categories have changed from prior years and now reflect single race categories & multi-race. Comparisons with prior reports are not advised.*

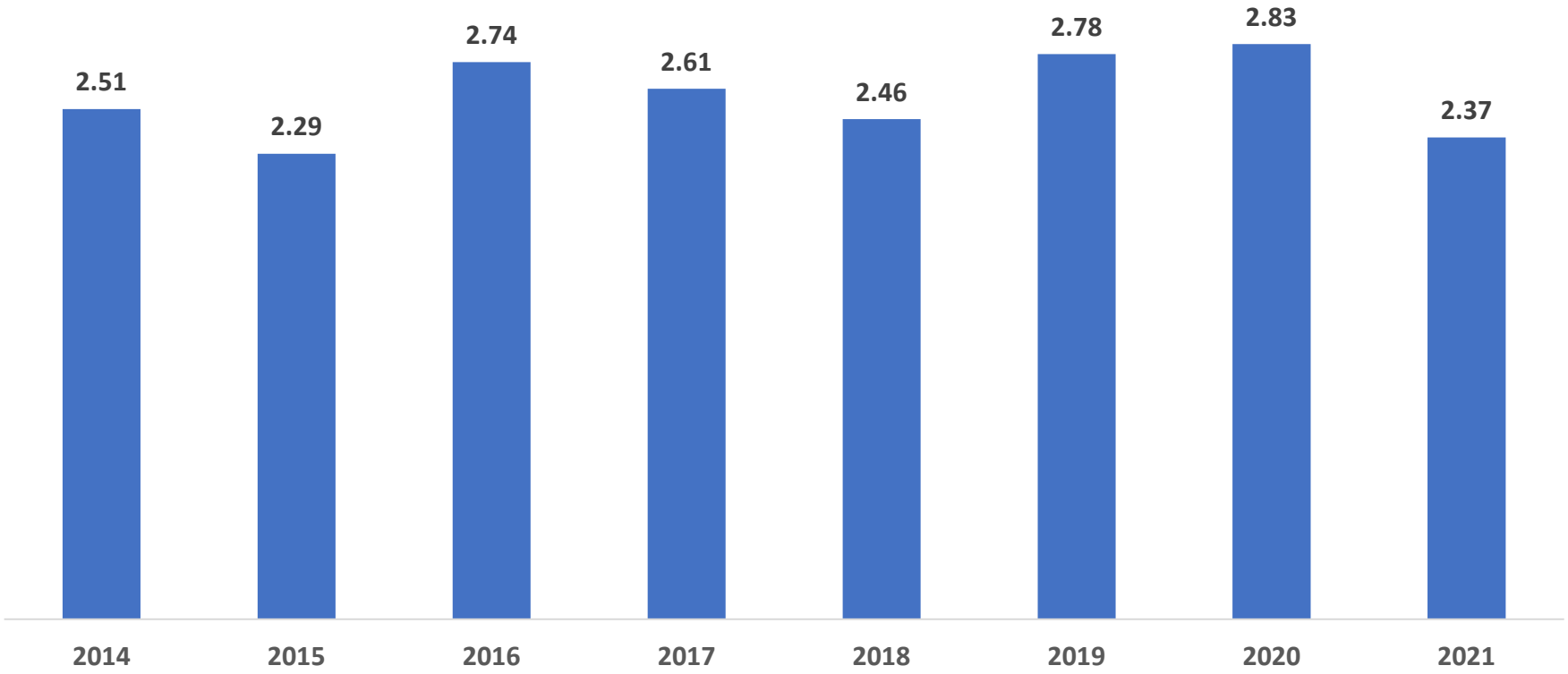
**Source: NC State Center for Health Statistics**

** NH = Non-Hispanic.*

# Non-Hispanic Black Infants continue to die at rates more than two times higher than Non-Hispanic White Infants

***Infant Mortality Disparity Ratios*, NC Residents 2014-2021***

**NC Perinatal Health Equity Collective Goal: 1.90**
**Healthy NC 2030 Target: 1.50**



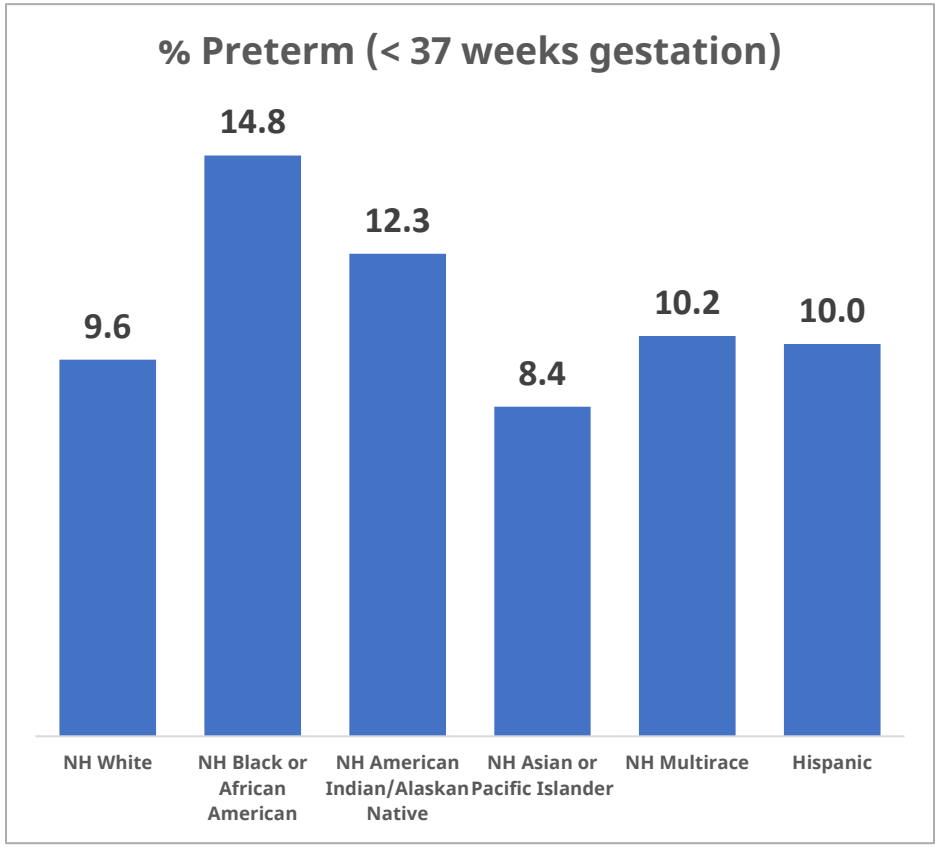

*Caution: Racial categories have changed from prior years and now reflect single race categories & multi-race. Comparisons with prior reports are not advised.*

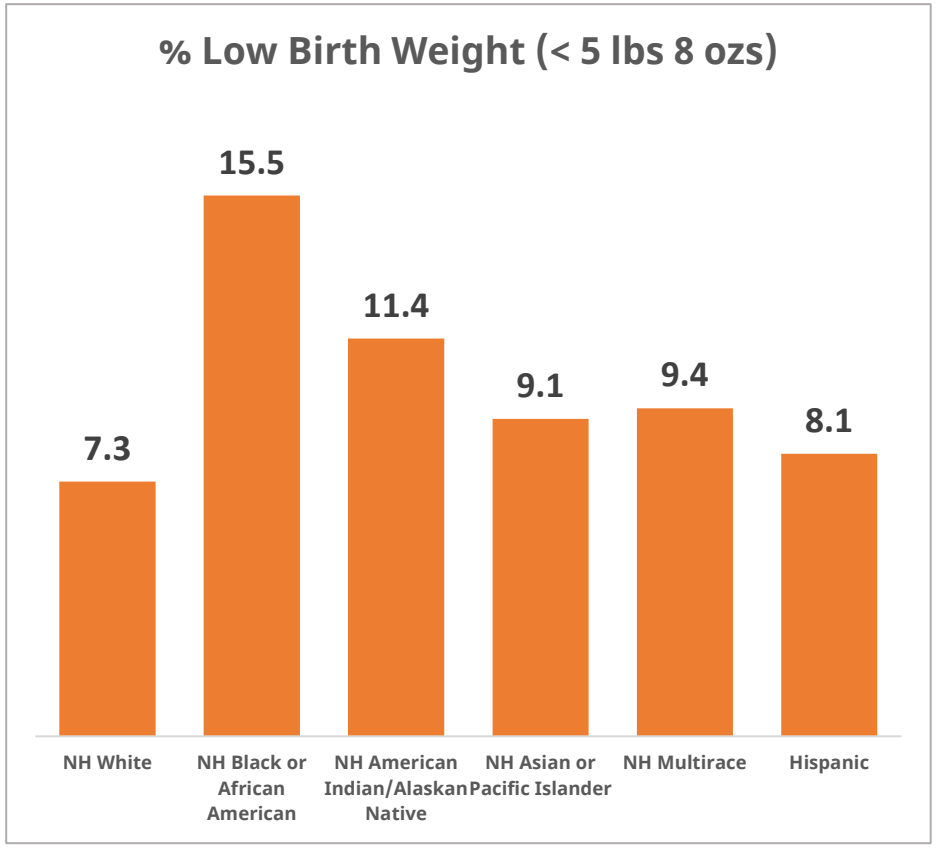
**Source: NC State Center for Health Statistics**

** Ratio of Non-Hispanic Black to Non-Hispanic White (Single Race) Infant Mortality Rates*

# Disparities in preterm and low birth weight persist among North Carolina births

***Percent of Births that are Low Birthweight and Preterm by Race/Ethnicity, NC Residents 2021***



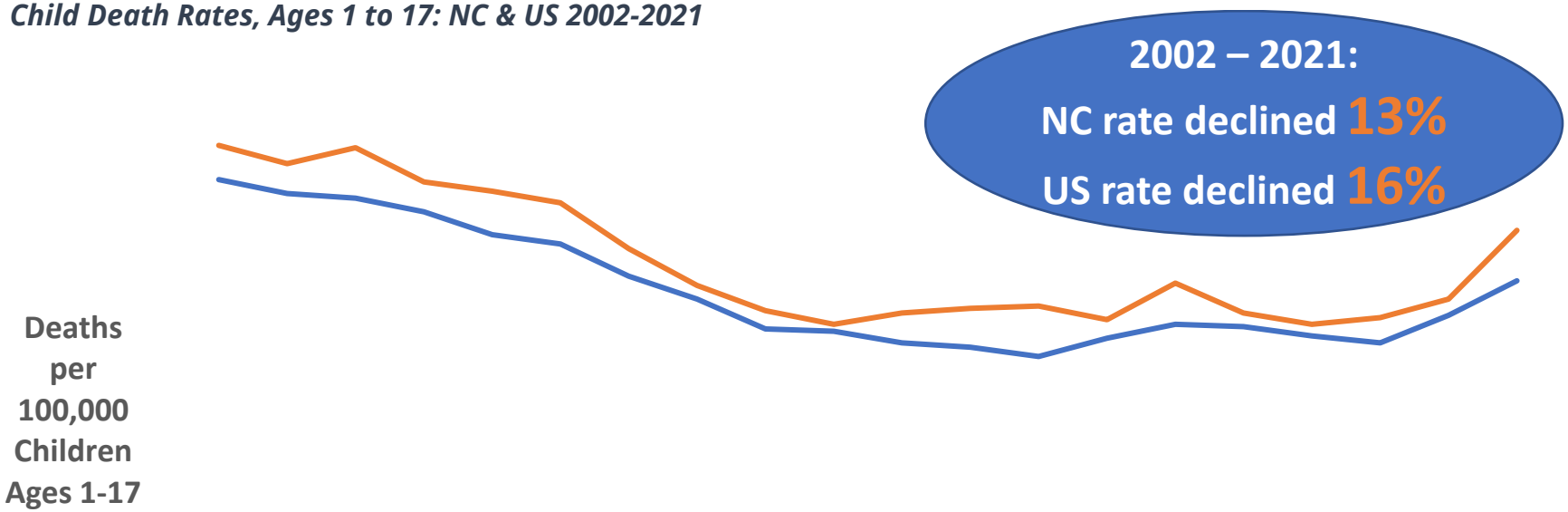

*Note: SCHS has implemented a new race reporting methodology. Race figures presented here are not comparable with earlier reports.*

**Source: NC State Center for Health Statistics (SCHS)**

** NH=Non-Hispanic, Single Race*

# North Carolina's death rates for children ages 1 to 17 remain slightly higher than US rates over the last two decades

*Child Death Rates, Ages 1 to 17: NC & US 2002-2021*

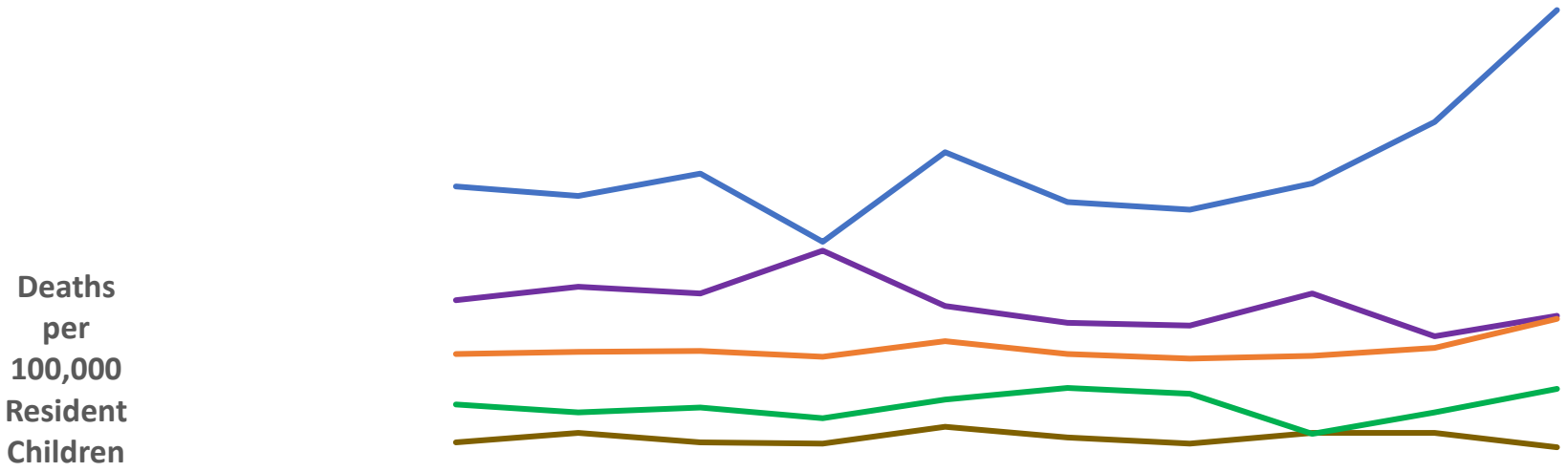



| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| US | 26.9 | 26.3 | 26.1 | 25.5 | 24.5 | 24.1 | 22.7 | 21.7 | 20.4 | 20.3 | 19.8 | 19.6 | 19.2 | 20.0 | 20.6 | 20.5 | 20.1 | 19.8 | 21.0 | 22.5 |
| NC | 28.4 | 27.6 | 28.3 | 26.8 | 26.4 | 25.9 | 23.9 | 22.3 | 21.2 | 20.6 | 21.1 | 21.3 | 21.4 | 20.8 | 22.4 | 21.1 | 20.6 | 20.9 | 21.7 | 24.7 |

Source: NC State Center for Health Statistics & National Center for Health Statistics

# Among non-infant children, adolescents ages 15 to 17 have the highest mortality rates over the last decade

*Non-Infant Child Death rates among children ages 1 to 17 by age group, NC 2012--2021*

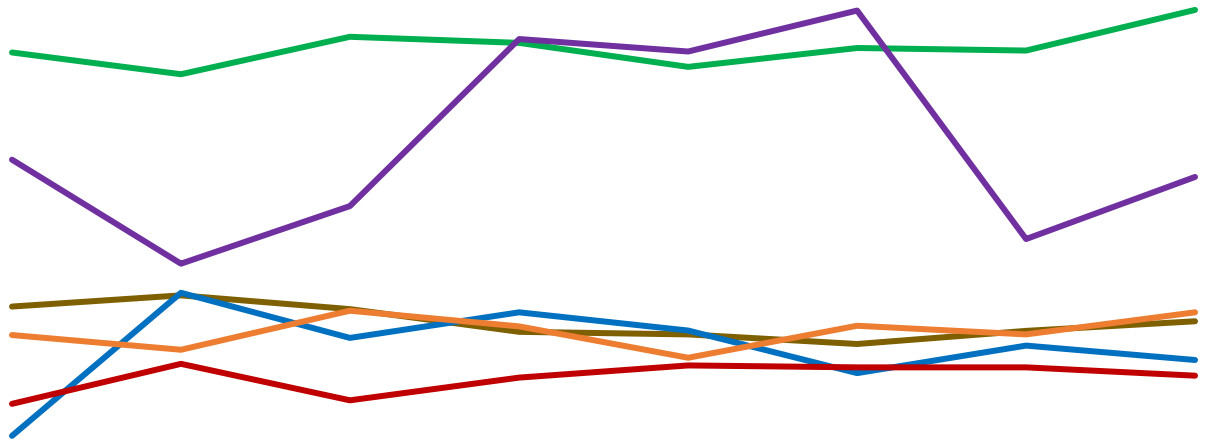



| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| … Ages 1-4 | 26.6 | 28.0 | 27.3 | 31.7 | 26.0 | 24.3 | 24.0 | 27.3 | 22.9 | 25.0 |
| … Ages 5-9 | 12.0 | 13.0 | 12.0 | 11.9 | 13.6 | 12.5 | 11.9 | 13.0 | 13.0 | 11.5 |
| … Ages 10-14 | 15.9 | 15.1 | 15.6 | 14.5 | 16.4 | 17.6 | 17.0 | 12.9 | 15.1 | 17.5 |
| … Ages 15-17 | 38.3 | 37.3 | 39.6 | 32.6 | 41.8 | 36.7 | 35.9 | 38.6 | 44.9 | 56.4 |
| … (Exc. Infants) Ages 1-17 | 21.1 | 21.3 | 21.4 | 20.8 | 22.4 | 21.1 | 20.6 | 20.9 | 21.7 | 24.7 |

**Source: NC State Center for Health Statistics**

# Non-Hispanic Black & American Indian children consistently have higher mortality rates compared to other groups

***Child Death Rates by Race/Ethnicity: NC 2014-2021***



Deaths per 100,000 Children Ages 0 to 17

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| NH White | 48.0 | 50.2 | 47.5 | 43.0 | 42.5 | 40.6 | 43.2 | 45.1 |
| NH Black | 98.1 | 93.8 | 101.2 | 100.0 | 95.3 | 99.0 | 98.5 | 106.5 |
| NH Am. Ind. | 77.0 | 56.5 | 67.8 | 100.8 | 98.3 | 106.4 | 61.3 | 73.6 |
| NH Asian/P.I. | 22.5 | 50.7 | 41.8 | 46.9 | 43.3 | 34.9 | 40.3 | 37.5 |
| NH Multiracial | 28.8 | 36.7 | 29.5 | 34.0 | 36.4 | 36.0 | 36.0 | 34.4 |
| Hispanic | 42.4 | 39.5 | 47.2 | 44.1 | 37.9 | 44.2 | 42.5 | 46.9 |

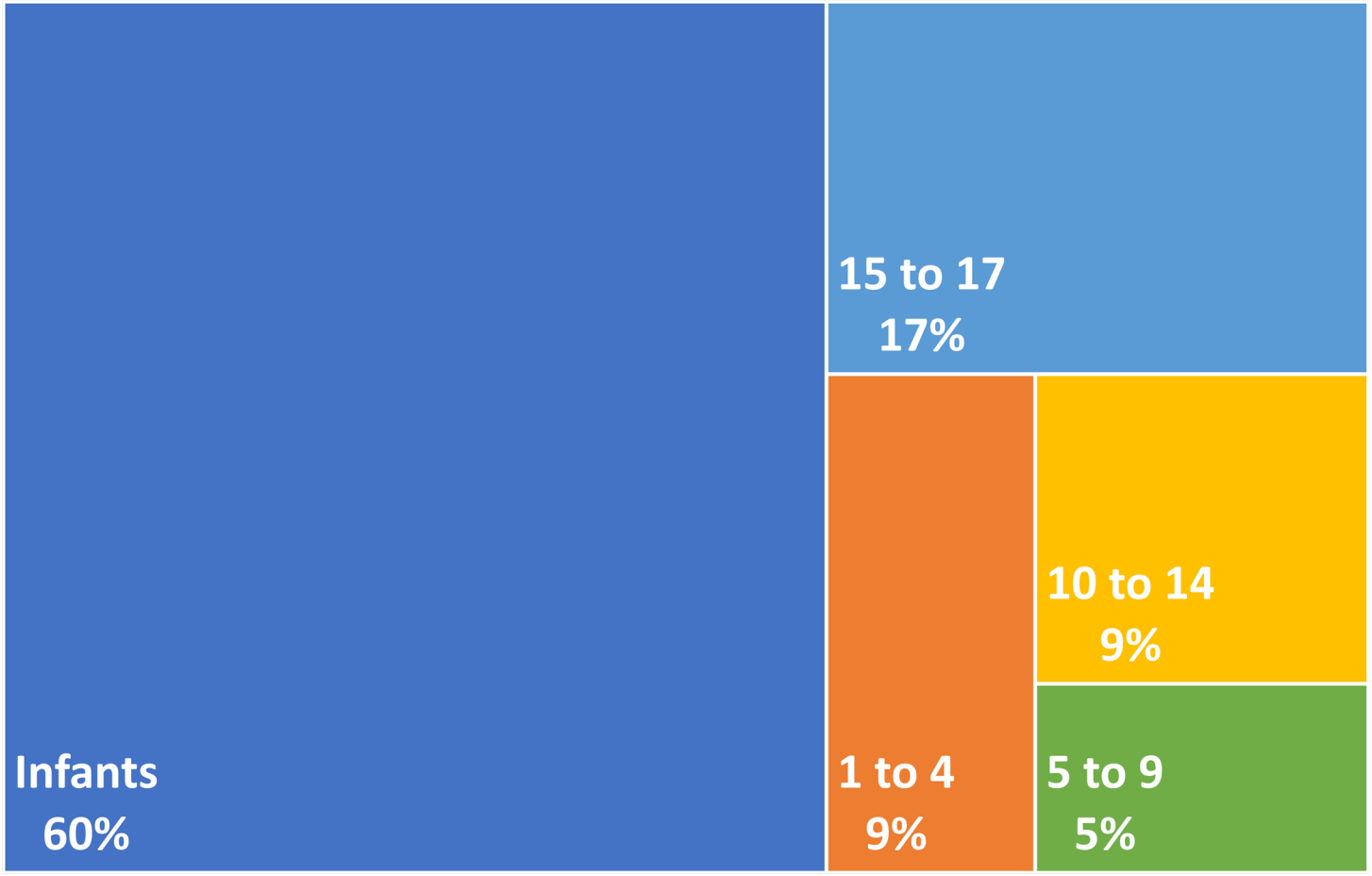
*Note: NH=Non-Hispanic. P.I.=Pacific Islander. Am.Ind. includes American Indian & Alaskan Native.*
*Caution: Racial categories have changed from prior years and now reflect single race categories & multi-race. Comparisons with prior reports are not advised.*

**Source: NC State Center for Health Statistics**

# Characteristics of Infant and Child Mortality in North Carolina

# Infants comprise the largest proportion of child deaths in North Carolina

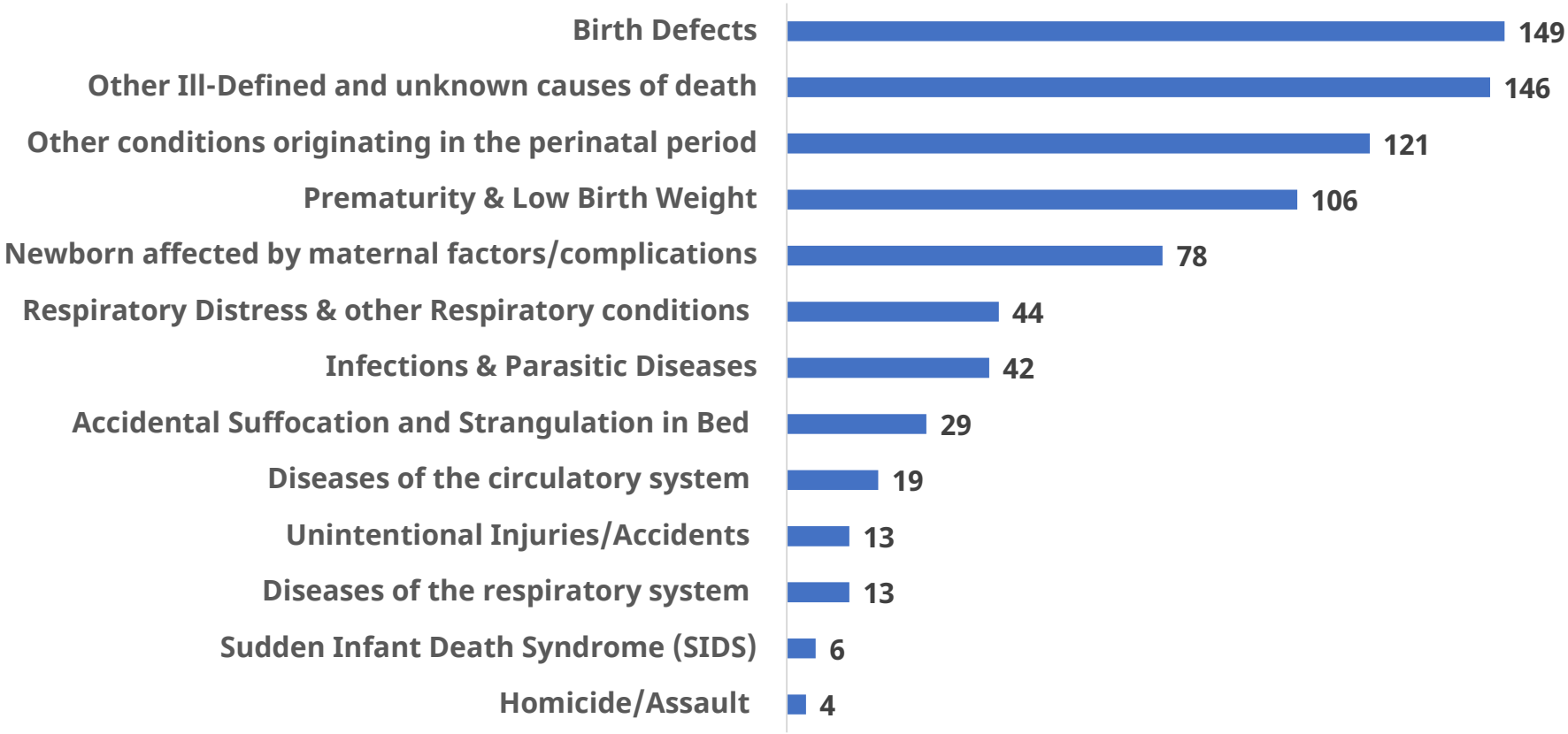
*Child Deaths by Age Group, NC Residents 2021 (N=1,360 deaths)*




**Source: NC State Center for Health Statistics**

# Birth Defects are the leading cause of infant death in North Carolina in 2021, followed by deaths of undetermined cause

***Leading Causes of Death Among Infants: Number of Deaths by Cause, NC 2021***
*(N=820 Total Deaths)*

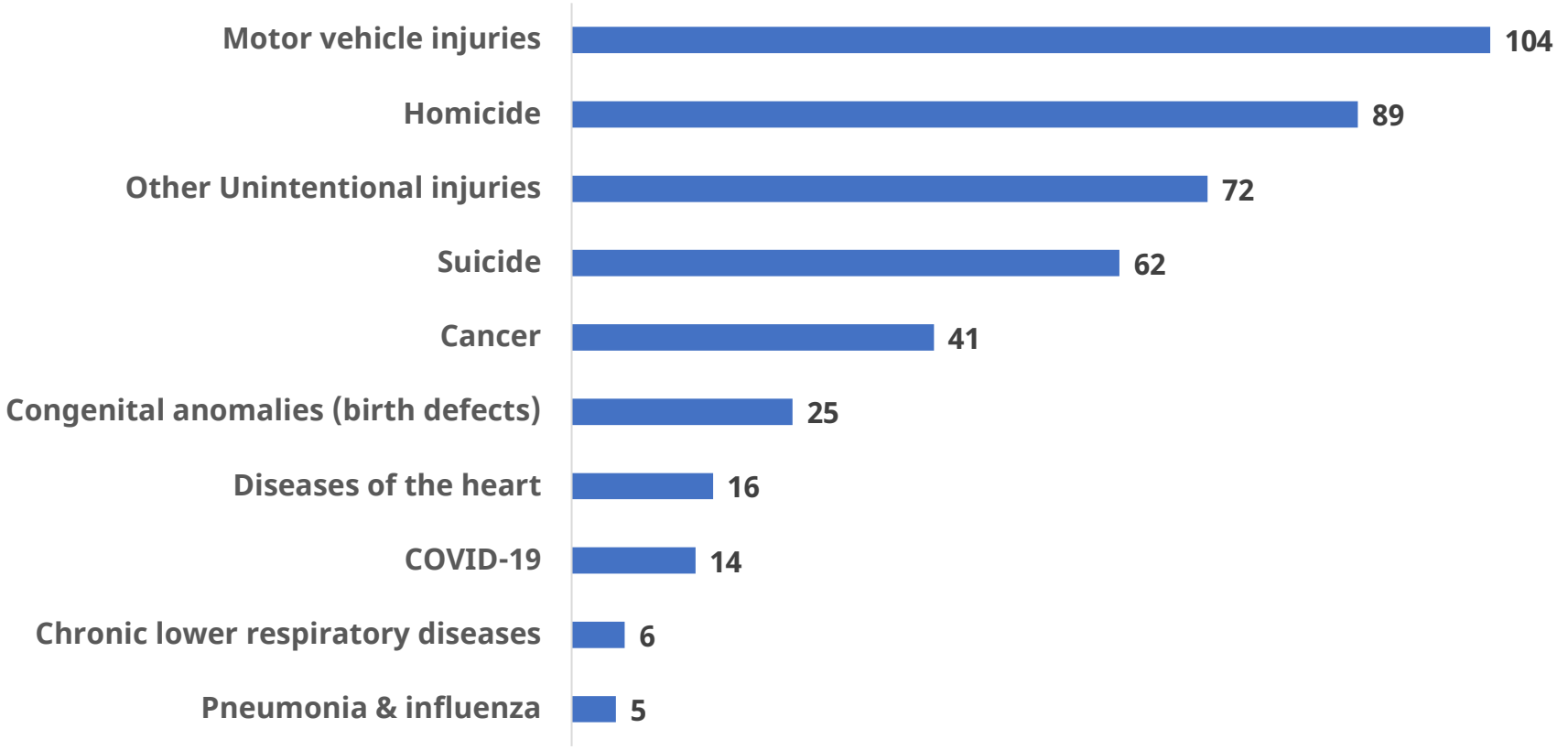



** Residual (all other causes) = 50 deaths*

**Source: NC State Center for Health Statistics**

# In 2021, injuries are the leading cause of death among North Carolina children ages 1 to 17 - comprising 61% of all (non-infant) child deaths

***Leading Causes of Death Among Children Ages 1 to 17: Number of Deaths by Cause, NC 2021***
*(N=540 Total Deaths)*

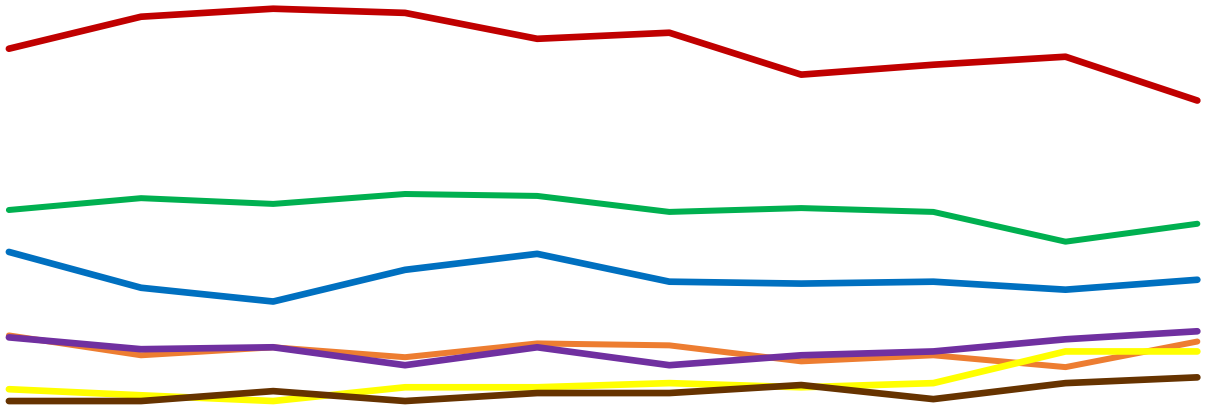



** Residual (all other causes) = 106 deaths*

**Source: NC State Center for Health Statistics**

# Over the last decade, child death rates associated with homicides, suicides & unintentional (non-MVA) injuries have increased

*Trends in Child Death Rates* for Selected Causes of Death, NC 2012-2021*



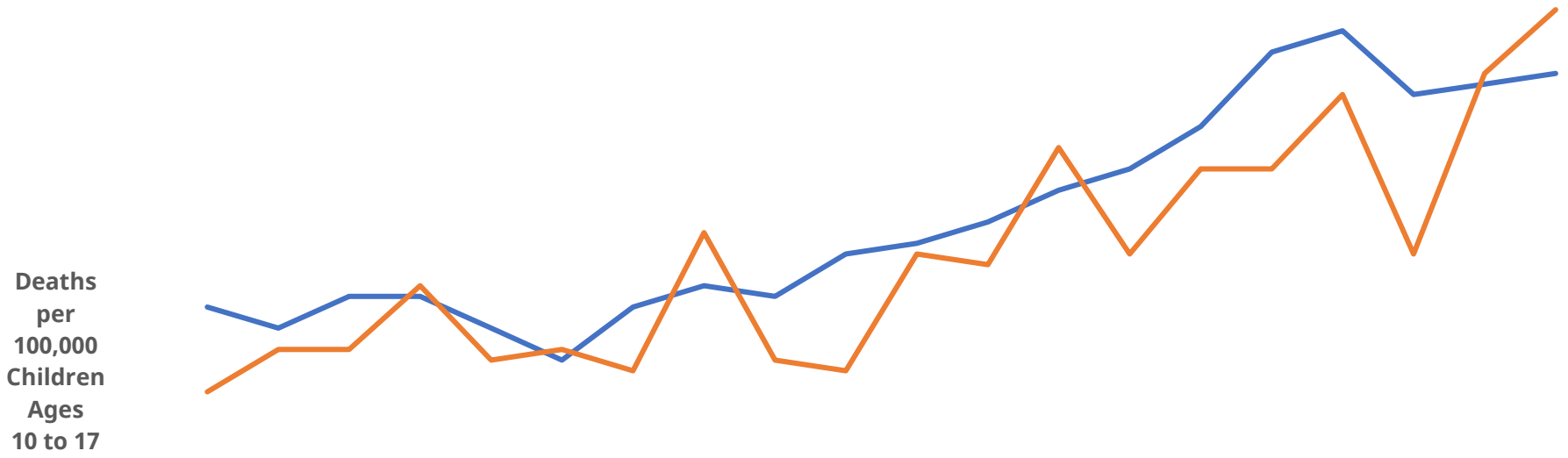
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Birth Defects | 9.0 | 7.2 | 6.5 | 8.1 | 8.9 | 7.5 | 7.4 | 7.5 | 7.1 | 7.6 |
| Perinatal Conditions | 19.2 | 20.8 | 21.2 | 21.0 | 19.7 | 20.0 | 17.9 | 18.4 | 18.8 | 16.6 |
| Medical Conditions/Illnesses | 11.1 | 11.7 | 11.4 | 11.9 | 11.8 | 11.0 | 11.2 | 11.0 | 9.5 | 10.4 |
| Motor Vehicle Injuries | 4.8 | 3.8 | 4.2 | 3.7 | 4.4 | 4.3 | 3.5 | 3.8 | 3.2 | 4.5 |
| Other Unintentional Injuries | 4.7 | 4.1 | 4.2 | 3.3 | 4.2 | 3.3 | 3.8 | 4.0 | 4.6 | 5.0 |
| Homicide | 2.1 | 1.8 | 1.5 | 2.2 | 2.2 | 2.4 | 2.2 | 2.4 | 4.0 | 4.0 |
| Suicide | 1.5 | 1.5 | 2.0 | 1.5 | 1.9 | 1.9 | 2.3 | 1.6 | 2.4 | 2.7 |

**Source: NC State Center for Health Statistics**

** Deaths per 100,000 Resident Children Ages 0 to 17*

# Among children ages 10 to 17, suicide rates increased in both the US and NC over the last two decades

***Suicide Rates, Ages 10 to 17: US & NC 2002-2021****



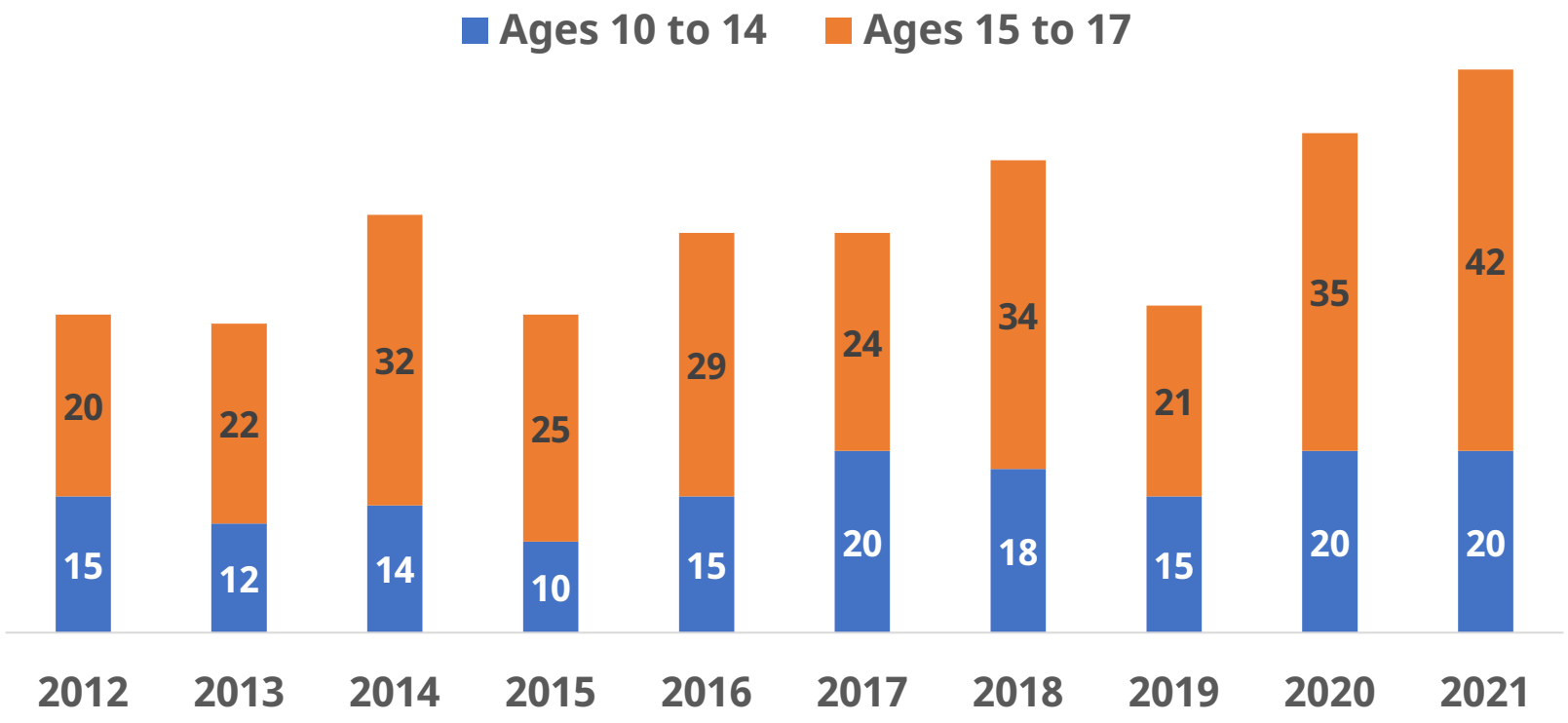

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| US | 2.9 | 2.7 | 3.0 | 3.0 | 2.7 | 2.4 | 2.9 | 3.1 | 3.0 | 3.4 | 3.5 | 3.7 | 4.0 | 4.2 | 4.6 | 5.3 | 5.5 | 4.9 | 5.0 | 5.1 |
| NC | 2.1 | 2.5 | 2.5 | 3.1 | 2.4 | 2.5 | 2.3 | 3.6 | 2.4 | 2.3 | 3.4 | 3.3 | 4.4 | 3.4 | 4.2 | 4.2 | 4.9 | 3.4 | 5.1 | 5.7 |

** Suicides include the following ICD mortality codes : X60-X84 (Intentional self-harm; Y87.0 (Sequelae of intentional self-harm), U03 (Suicide Terrorism)*

**Source: NC State Center for Health Statistics & National Center for Health Statistics**

# Suicides have been rising among NC children ages 10 to 17 over the last decade, with older teens experiencing the largest increase

*Number of Suicides by Age Group: Ages 10 to 17, NC 2012-2021*

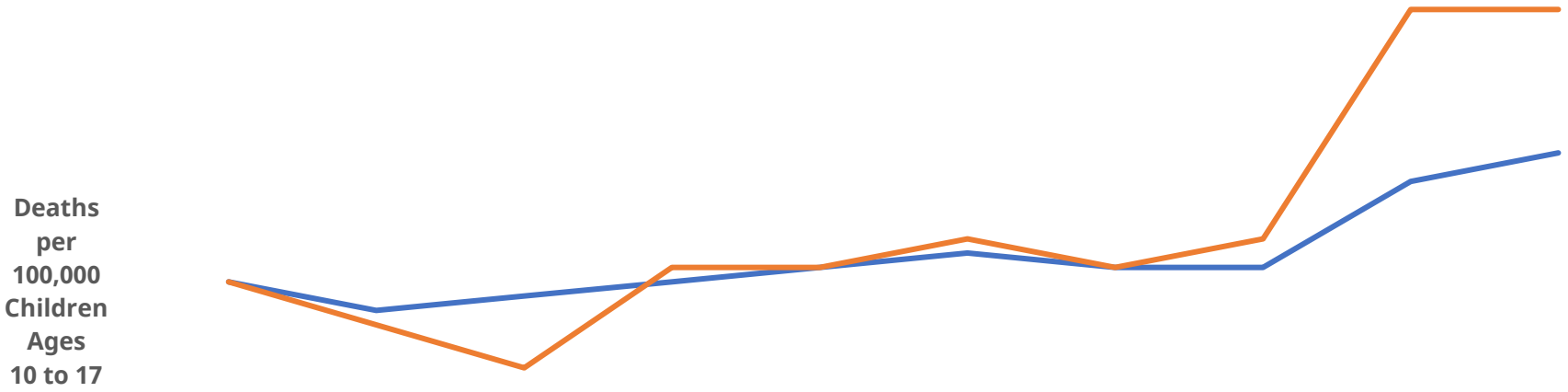



** Suicides include the following ICD mortality codes : X60-X84 (Intentional self-harm; Y87.0 (Sequelae of intentional self-harm), U03 (Suicide Terrorism)*

**Source: NC State Center for Health Statistics**

# North Carolina Child Homicide rates remain high in 2020 and 2021

***Child Homicide Rates, Ages 0 to 17: US & NC, 2012-2021***



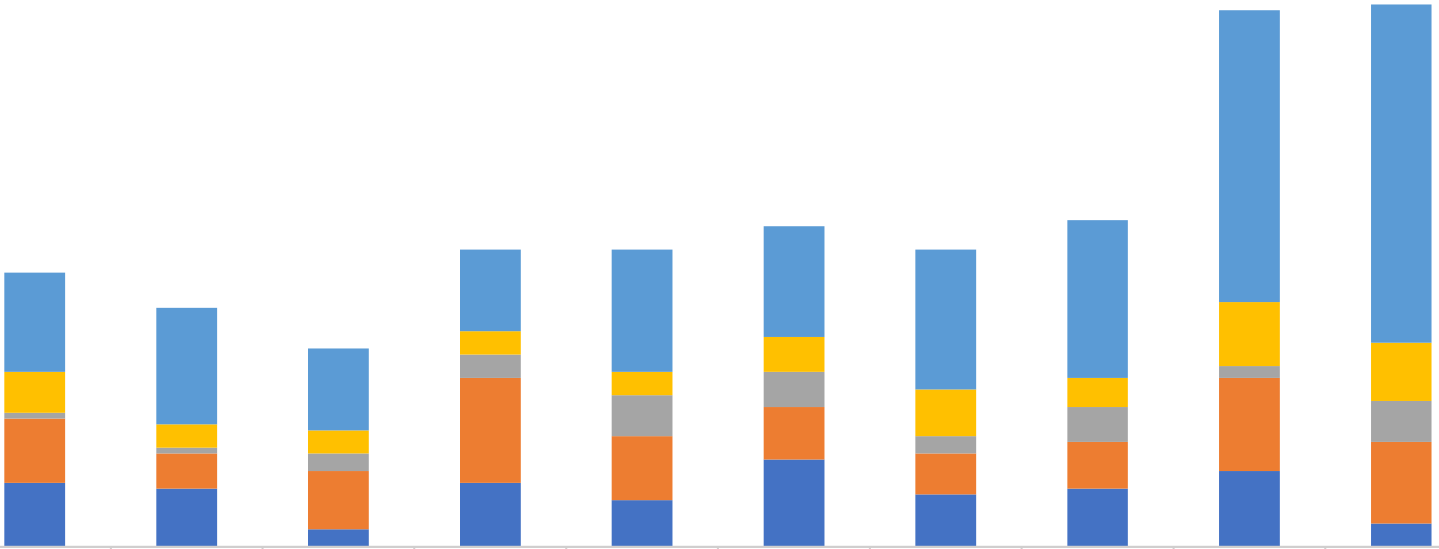

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| US | 2.1 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.2 | 2.2 | 2.8 | 3.0 |
| NC | 2.1 | 1.8 | 1.5 | 2.2 | 2.2 | 2.4 | 2.2 | 2.4 | 4.0 | 4.0 |

** Homicide includes the following ICD mortality codes : X85-Y09 (Assault), Y87.1 (Sequelae of assault), U01 (Terrorism Assault)*

**Source: NC State Center for Health Statistics & National Center for Health Statistics**

# Among children, older teens (ages 15 to 17) account for the largest increase in homicides over the last decade

***Number of Child Homicides by Age Group: NC 2012-2021***



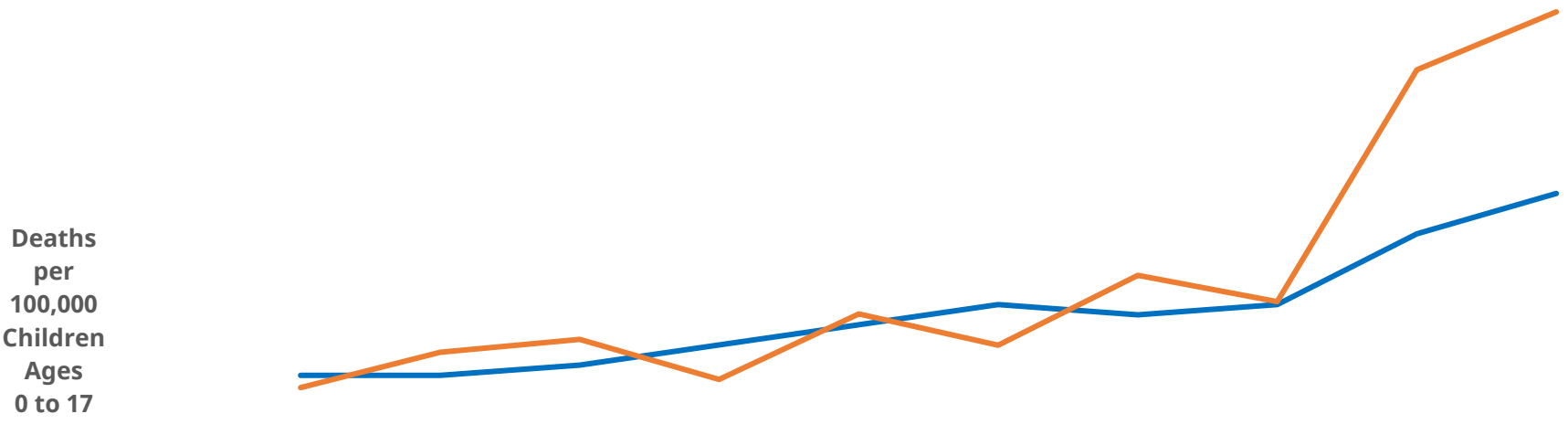
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ages 15-17 | 17 | 20 | 14 | 14 | 21 | 19 | 24 | 27 | 50 | 58 |
| Ages 10-14 | 7 | 4 | 4 | 4 | 4 | 6 | 8 | 5 | 11 | 10 |
| Ages 5-9 | 1 | 1 | 3 | 4 | 7 | 6 | 3 | 6 | 2 | 7 |
| Ages 0-4 | 11 | 6 | 10 | 18 | 11 | 9 | 7 | 8 | 16 | 14 |
| Infants | 11 | 10 | 3 | 11 | 8 | 15 | 9 | 10 | 13 | 4 |

** Homicide includes the following ICD mortality codes : X85-Y09 (Assault), Y87.1 (Sequelae of assault), U01 (Terrorism Assault)*

**Source: NC State Center for Health Statistics**

# Firearm-related death rates have increased substantially in North Carolina in the last two years

***Firearm-related Mortality Rates*, Children Ages 0 to 17: NC & US, 2012-2021***



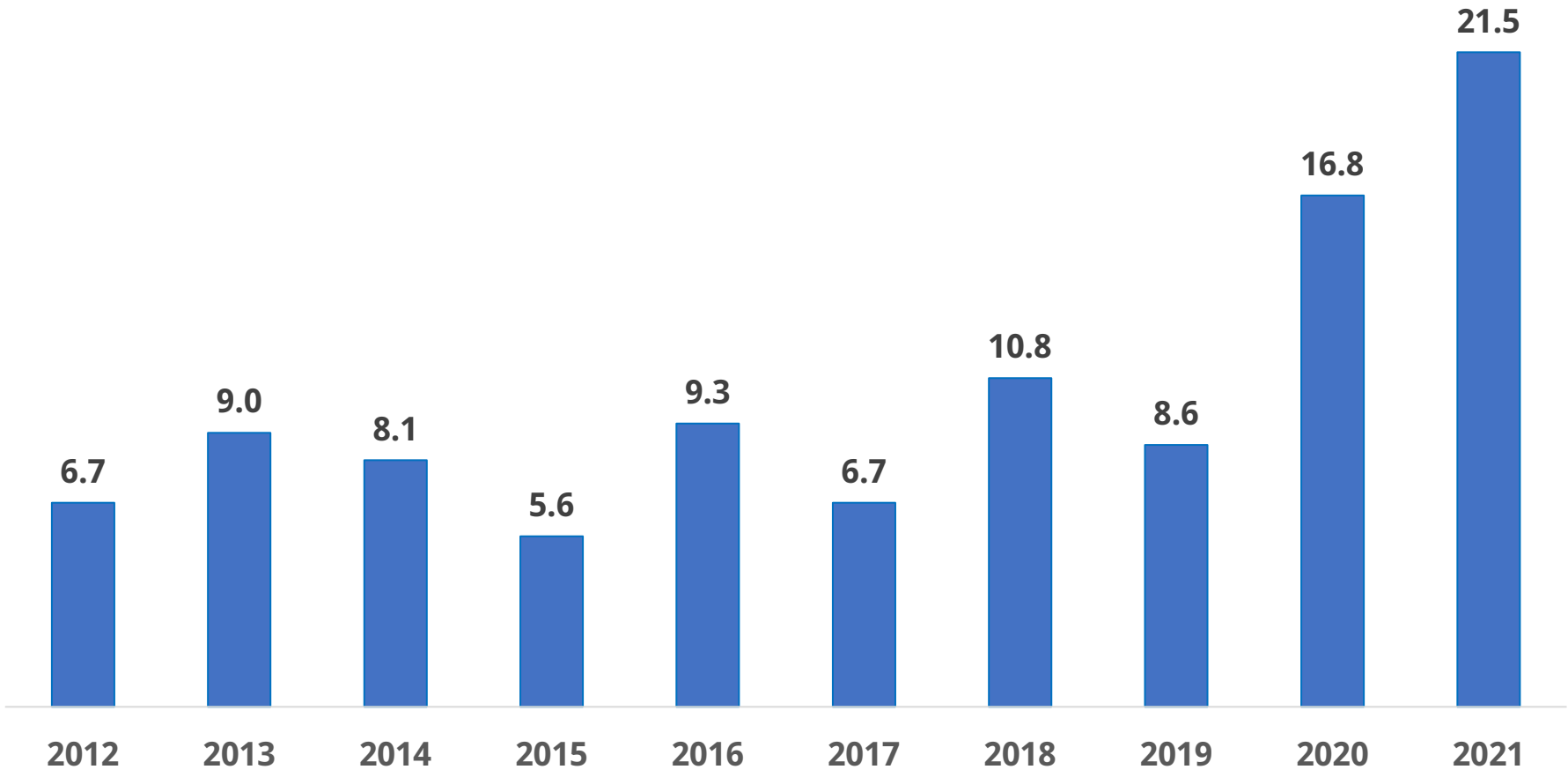

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| US | 1.7 | 1.7 | 1.8 | 2.0 | 2.2 | 2.4 | 2.3 | 2.4 | 3.1 | 3.5 |
| NC | 1.6 | 1.9 | 2.1 | 1.7 | 2.3 | 2.0 | 2.7 | 2.4 | 4.7 | 5.3 |

** Firearm deaths include the following ICD mortality codes : W32-W34 (Unintentional), X72-X74 (Suicide), X93-X95 (Homicide), U014 (Terrorism), & Y22-Y24 (Undetermined Intent)*

**Source: NC State Center for Health Statistics & National Center for Health Statistics**

# Adolescents ages 15 to 17 have experienced large increases in firearm-related mortality rates in both 2020 & 2021

***Firearm-related Mortality Rates*, Children Ages 15 to 17: NC, 2012-2021***



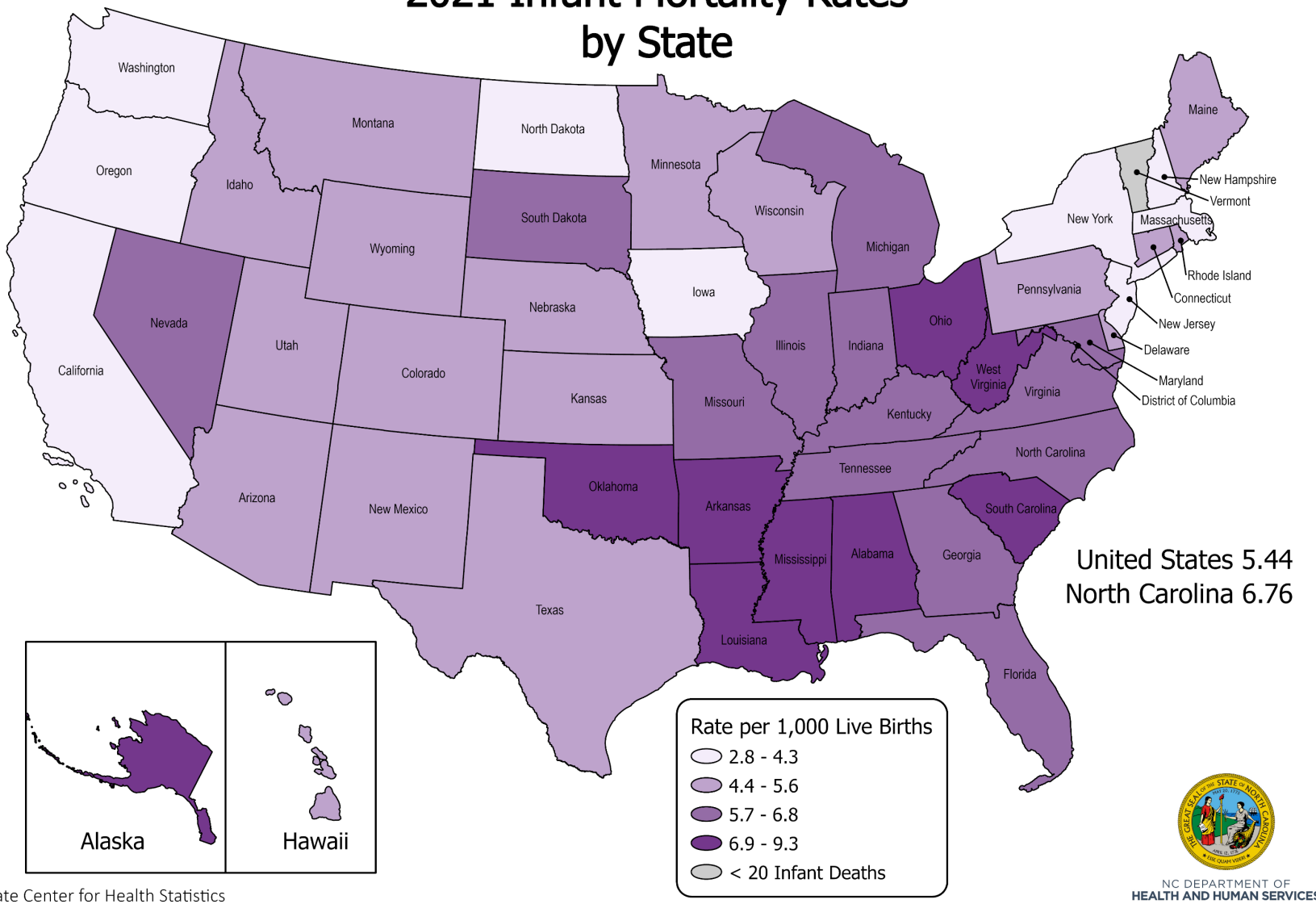

** Firearm deaths include the following ICD mortality codes : W32-W34 (Unintentional), X72-X74 (Suicide), X93-X95 (Homicide), U014 (Terrorism), & Y22-Y24 (Undetermined Intent)*

**Source: NC State Center for Health Statistics & National Center for Health Statistics**

*Deaths per 100,000 Adolescents Ages 15-17*

# Geographic Patterns in Infant & Child Mortality

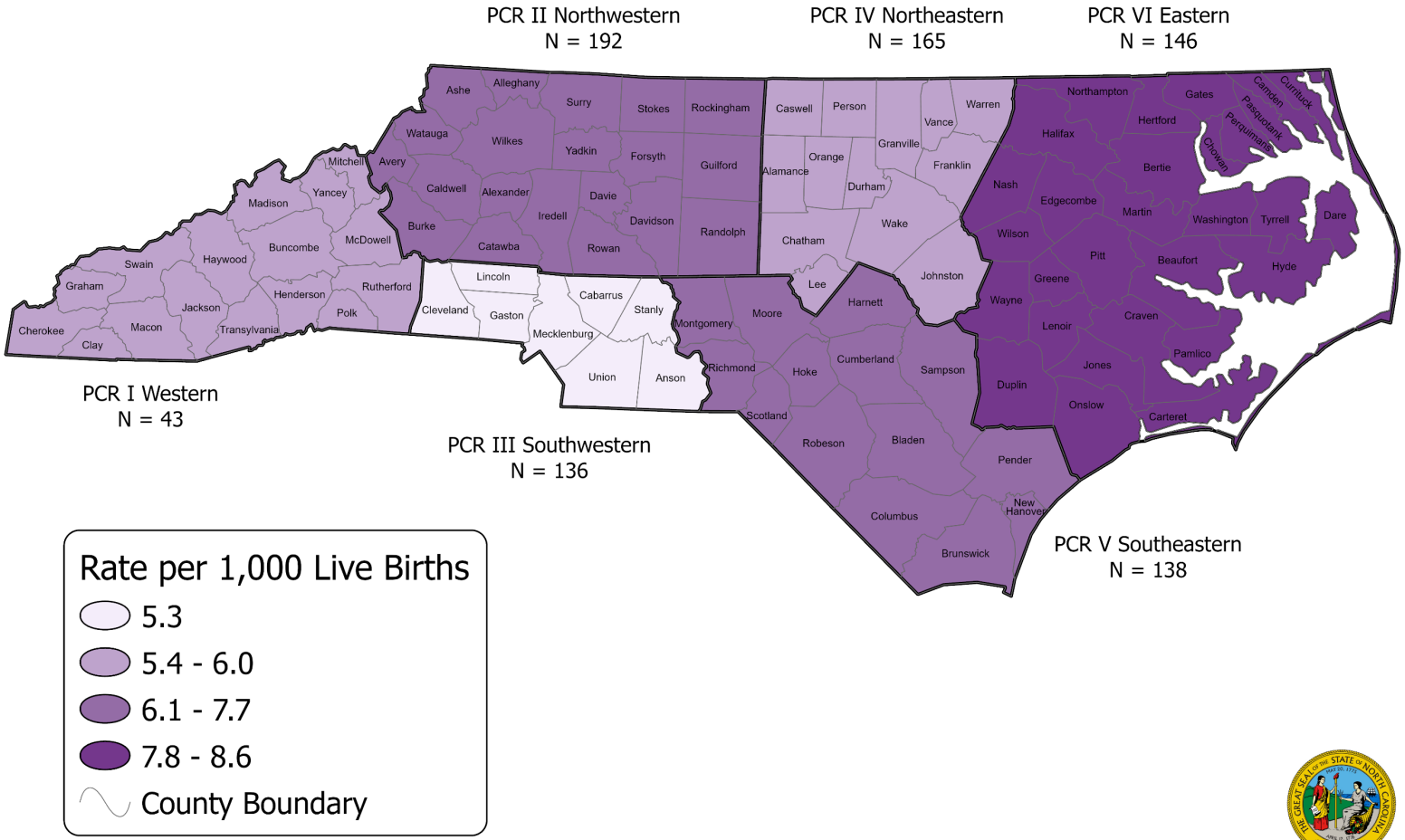
# United States
# 2021 Infant Mortality Rates
# by State




State Center for Health Statistics

NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES

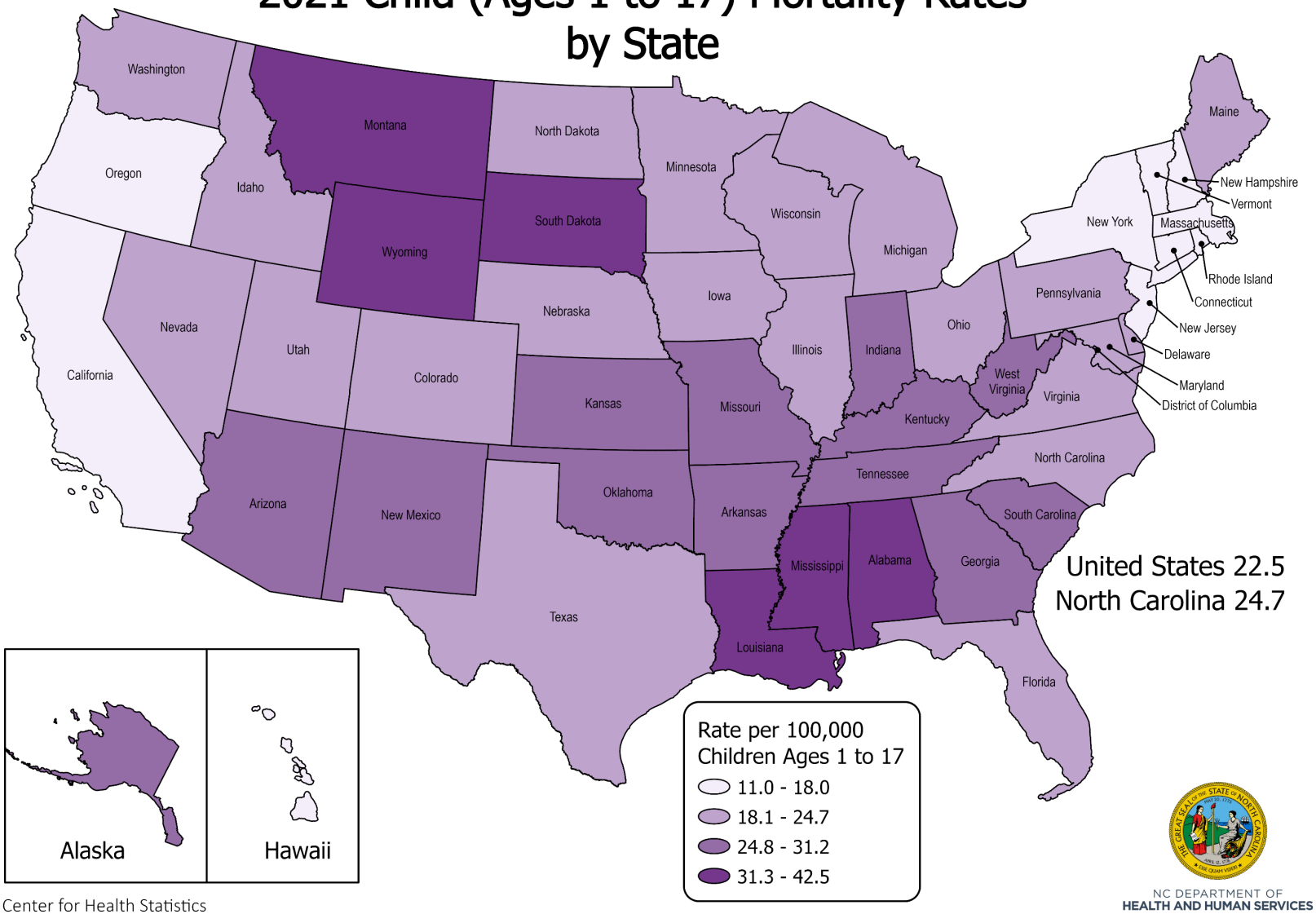
# North Carolina
# Infant Mortality Rates by Perinatal Care Regions (PCR)
# 2021




State Center for Health Statistics

NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES

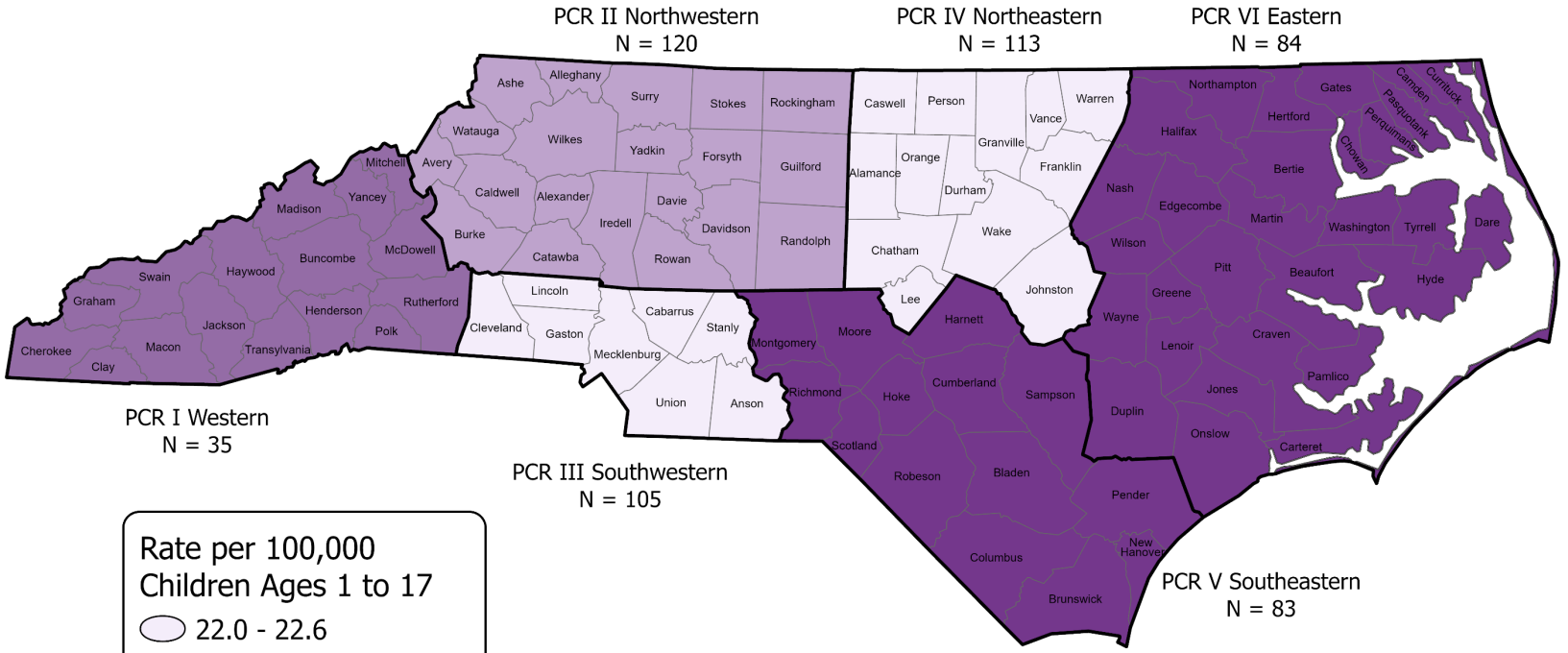
# United States
# 2021 Child (Ages 1 to 17) Mortality Rates by State




State Center for Health Statistics

NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES

# North Carolina
# Child (Ages 1 to 17) Mortality Rates
# by Perinatal Care Regions (PCR)
# 2021

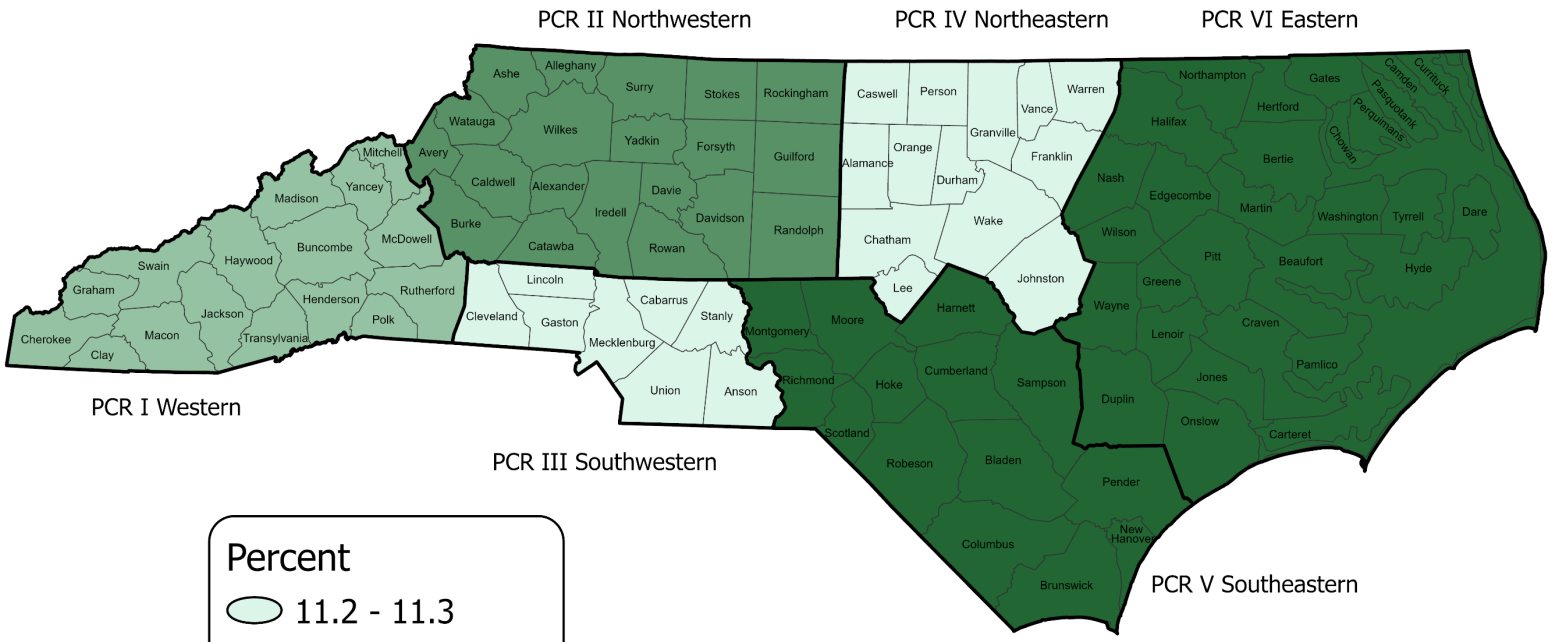



State Center for Health Statistics

NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES

# Geographic Patterns in Social Determinants of Health in North Carolina

# North Carolina
# 2020 Estimated Percent Population Below Poverty by Perinatal Care Regions (PCR)




Source: U.S. Census, American Community Survey
2020, 5-Year Estimates (2016-2020)

State Center for Health Statistics

NC DEPARTMENT OF
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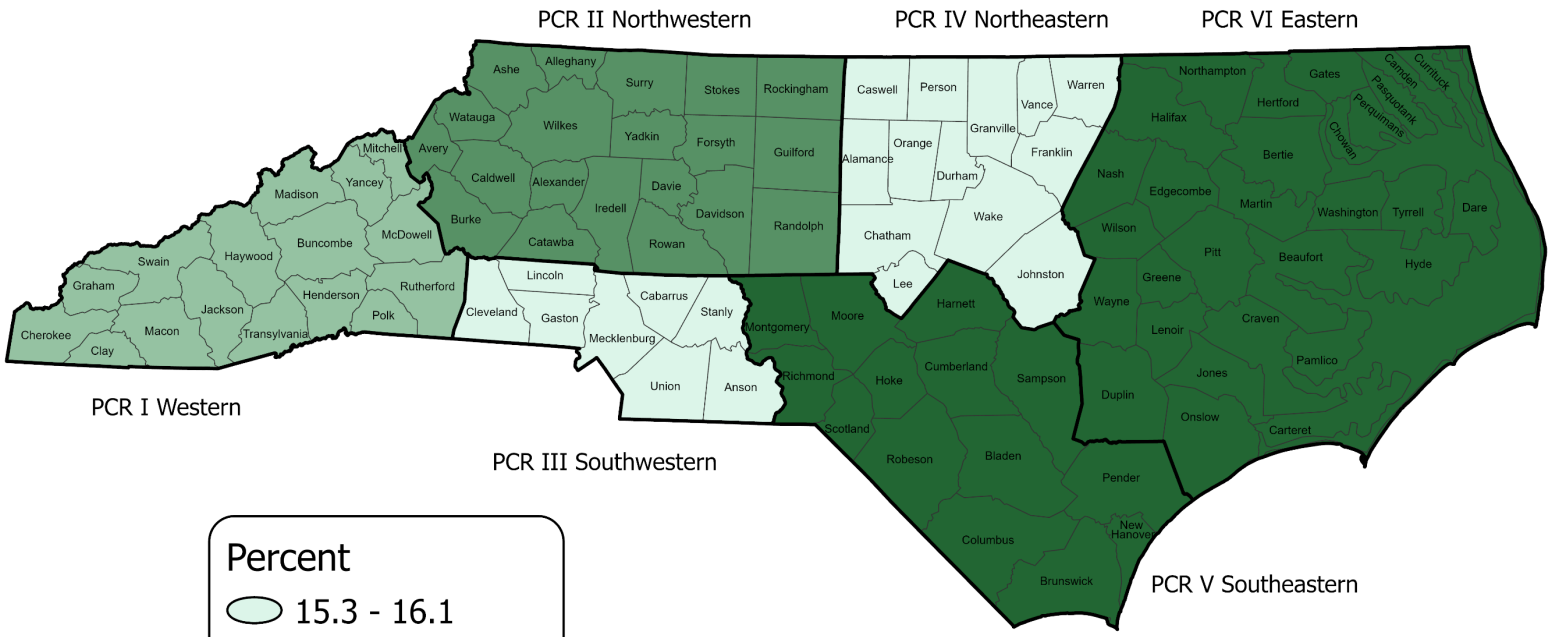
# North Carolina
# 2020 Estimated Percent Children Ages 0 to 17 Below Poverty by Perinatal Care Regions (PCR)




Source: U.S. Census, American Community Survey
2020, 5-Year Estimates (2016-2020)

State Center for Health Statistics

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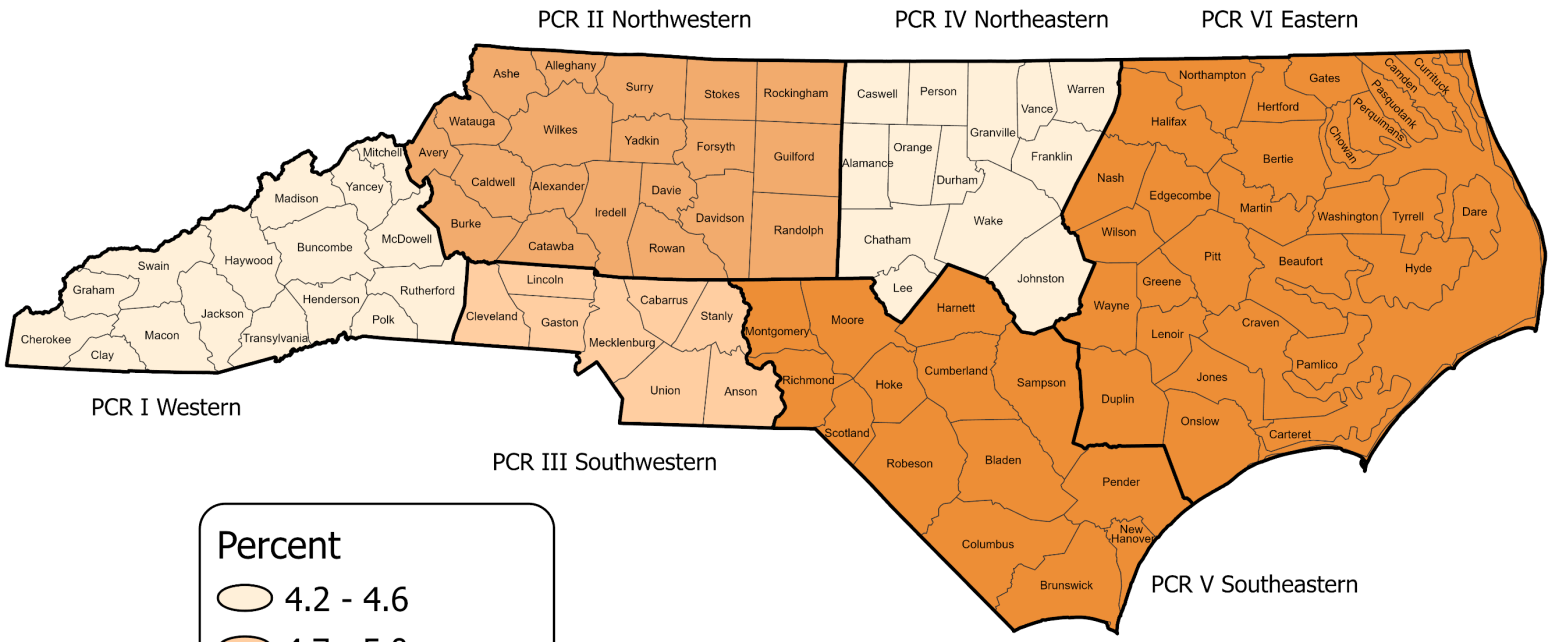
# North Carolina
# 2020 Estimated Percent Population Unemployed by Perinatal Care Regions (PCR)




**Percent**

- 4.2 - 4.6
- 4.7 - 5.0
- 5.1 - 5.6
- 5.7 - 7.1
- County Boundary

Source: U.S. Census, American Community Survey
2020, 5-Year Estimates (2016-2020)

Population = Age 16 and over in the Labor Force



NC DEPARTMENT OF
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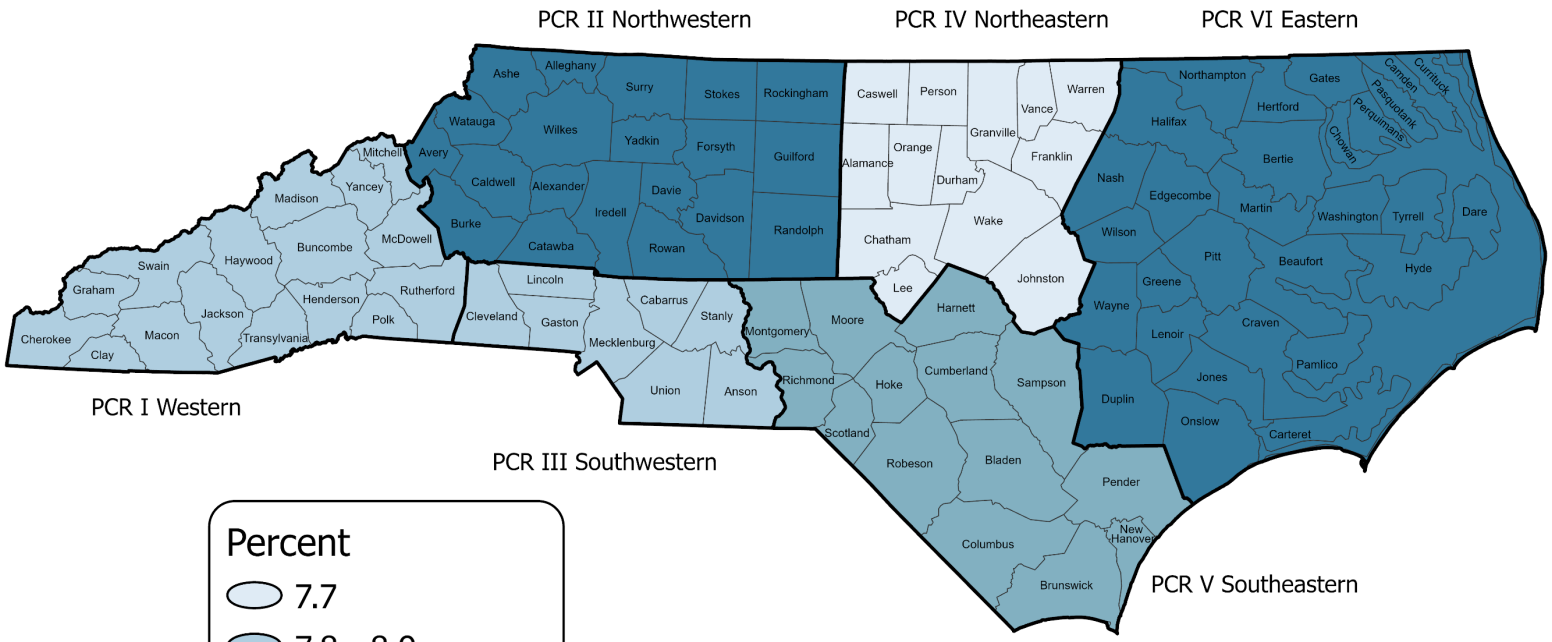
# North Carolina
# 2020 Estimated Percent Females Ages 18 to 44 with No High School Diploma by Perinatal Care Regions (PCR)

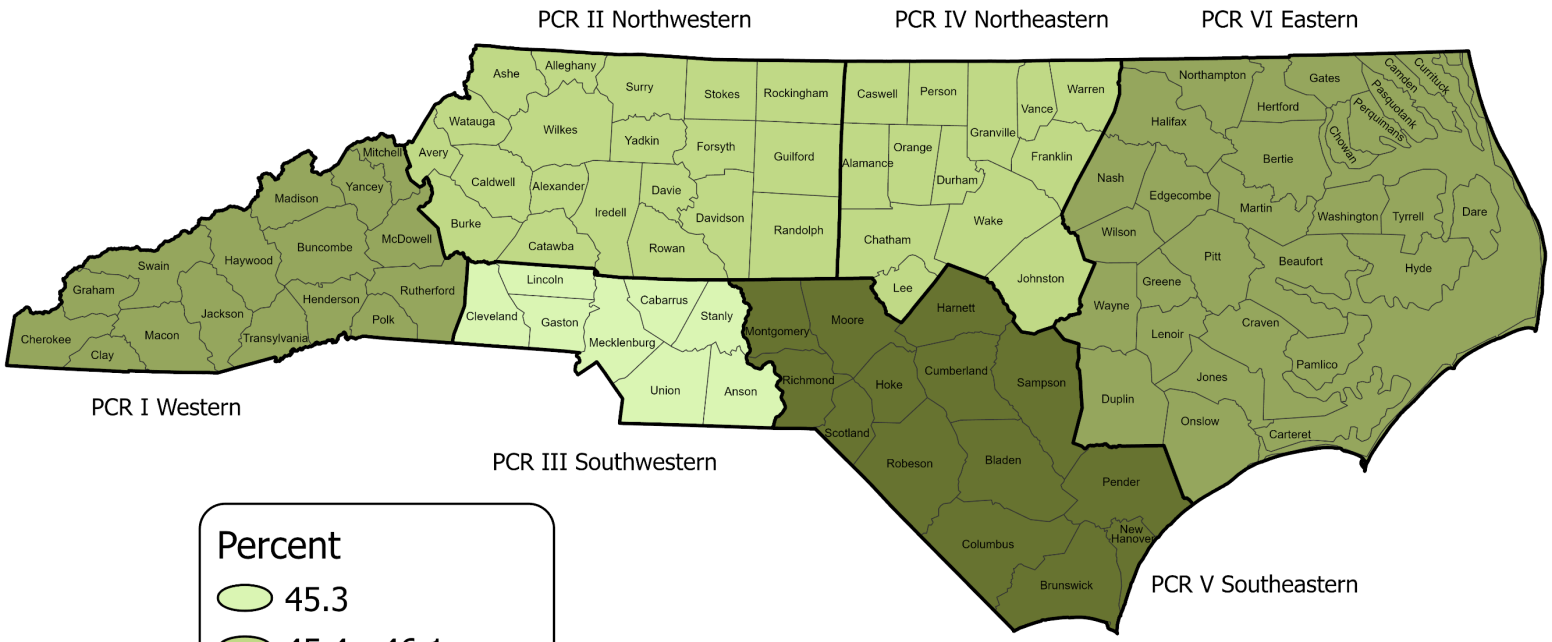



Source: U.S. Census, American Community Survey
2020, 5-Year Estimates (2016-2020)

State Center for Health Statistics

NC DEPARTMENT OF
HEALTH AND HUMAN SERVICES

# North Carolina
# 2020 Estimated Percent Renters Spending Greater Than 30% of Household Income on Rent by Perinatal Care Regions (PCR)




Percent
- 45.3
- 45.4 - 46.1
- 46.2 - 48.0
- 48.1 - 49.8
- County Boundary

Source: U.S. Census, American Community Survey 2020, 5-Year Estimates (2016-2020)



NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

# Infant Mortality & Child Death Reports available at the State Center for Health Statistics:

- **2021 Infant Mortality Report:** https://schs.dph.ncdhhs.gov/data/vital/ims/2021/
- **2021 Child Death Report:** https://schs.dph.ncdhhs.gov/data/vital/cd/2021/

# Questions?

**Contact**:

Kathleen Jones-Vessey
kathleen.jones-vessey@dhhs.nc.gov

NC Department of Health and Human Services

# Injury Surveillance Overview

## NC Child Fatality Prevention Summit

**Scott Proescholdbell, MPH**
Epidemiologist and Unit Manager
Injury Epidemiology, Surveillance and Informatics Unit

**March 30, 2023**

# Overview

- Overview of Injury & Violence Surveillance
- Unintentional Injuries (MVT)
- NC-VDRS/NC-FASTER (homicide/suicide/firearm)
- Syndromic Surveillance System (SyS)
- SyS for Behavioral Health/Mental Health
- Q&A

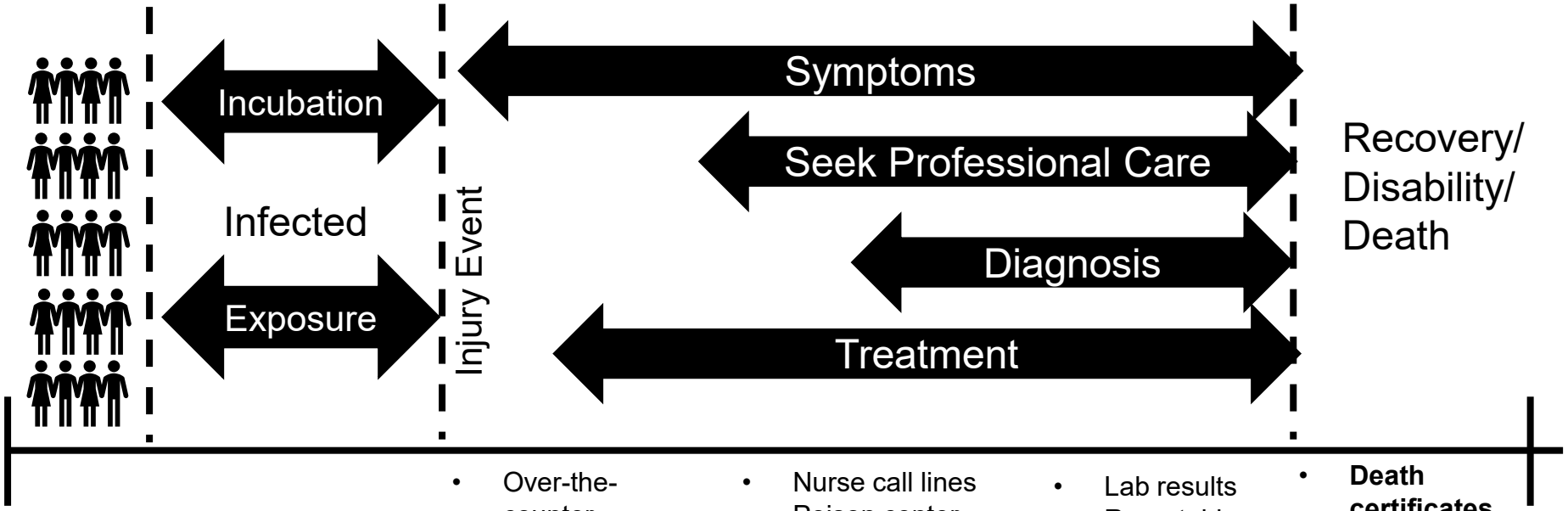
# Overview:
# Injury Surveillance Systems

# Public Health Surveillance

" Public health surveillance is the ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation and evaluation of public health practice."

*Stephen B. Thacker, 1994*

# Injury Surveillance Timeline: Potential Data Sources




- Over-the-counter medication sales
- School absenteeism
- PDMP (CSRS)

- Nurse call lines
- Poison center calls
- School nurse data
- Outpatient visits
- **ED visits**
- EMS data
- 911 data
- **Hosp Discharge**

- Lab results
- Reportable diseases
- Trauma Registry
- HIE
- Urgent Care
- **NC-FASTER**

- **Death certificates data**
- Medical examiner reports
- **NC-VDRS**
- **NC-SUDORS**

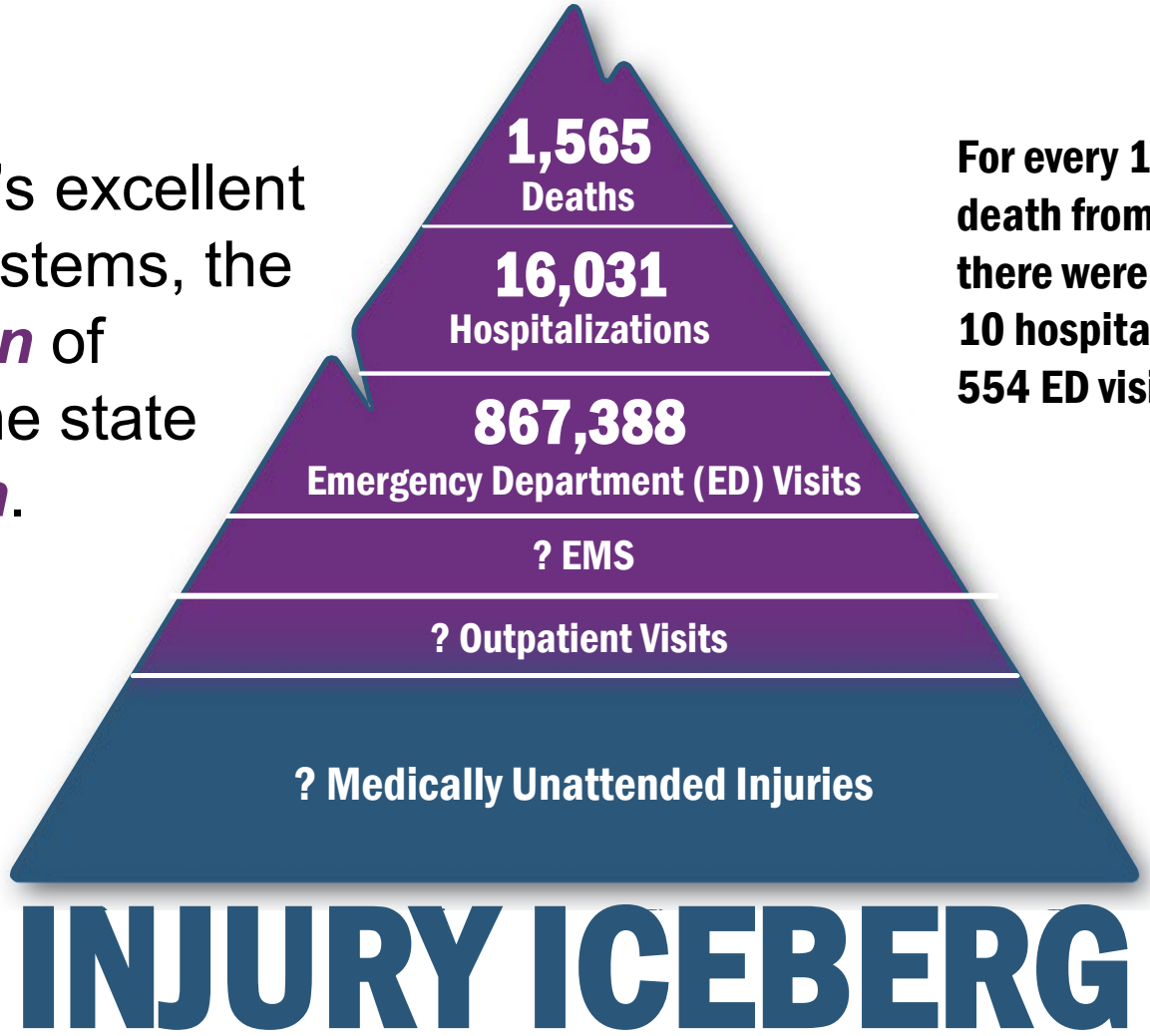
Adapted from: Lombardo, J., S. & Buckeridge, D., L. (2007). *Disease surveillance: A public health informatics approach.* Wiley-Interscience

# Finagle's Laws on Information

- **The information you have is not what you want.**
- **The information you want is not what you need.**
- **The information you need is not what you can obtain.**

# Child injury deaths are just the tip of the iceberg.

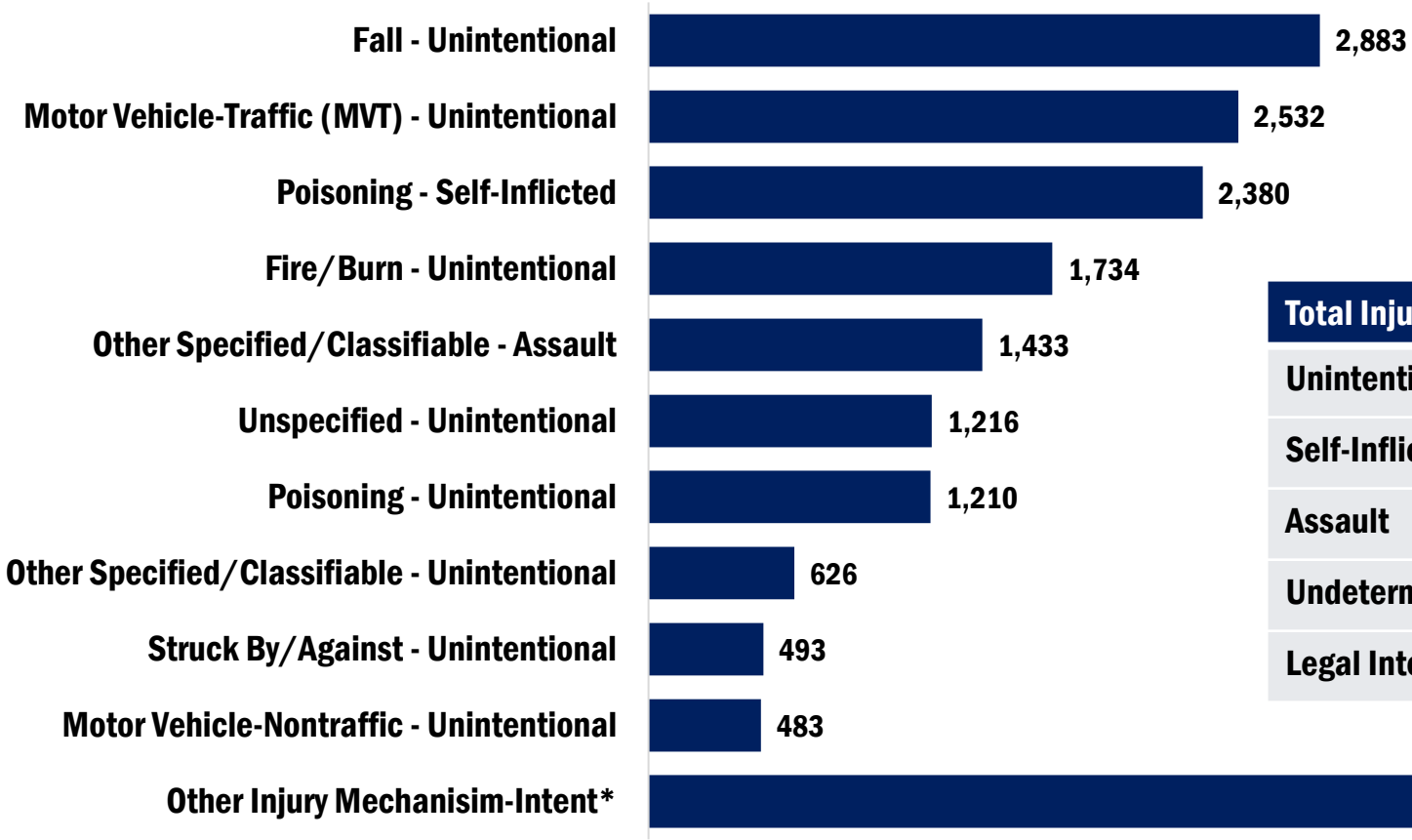
Despite NC's excellent reporting systems, the ***total burden*** of injuries in the state is ***unknown***.




**For every 1 child injury death from 2017-2021, there were 10 hospitalizations and 554 ED visits**

Limited to residents ages 0-17
Source: NC State Center for Health Statistics, Vital Statistics Deaths (2017-2021) and Hospital Discharge Data (2017-2021); NC DETECT, ED Visit Data (2017-2021)
Analysis by the DPH Injury and Violence Prevention Branch, Injury Epidemiology and Surveillance, and Informatics Unit

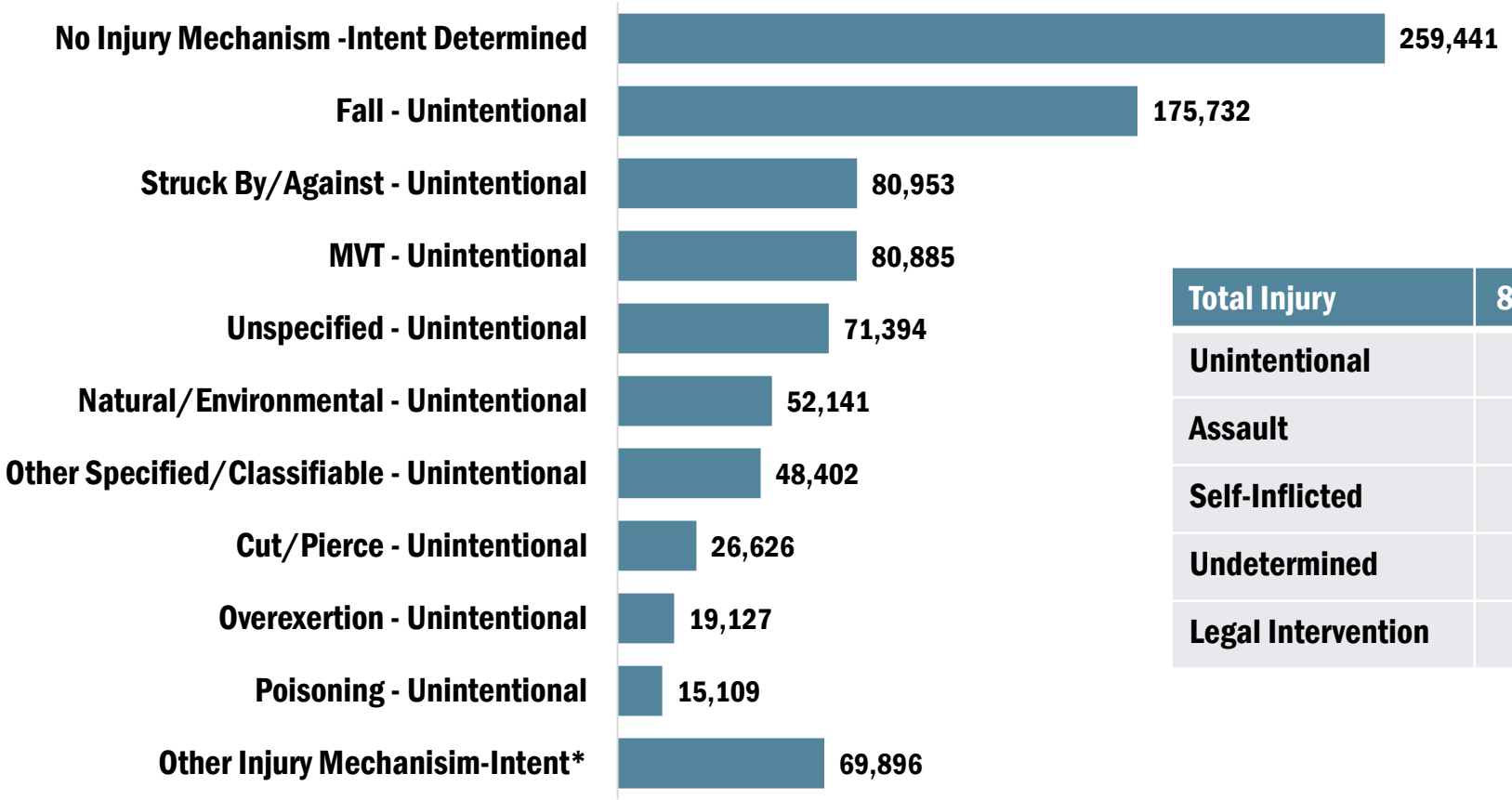
# Leading Causes of Injury Hospitalizations: NC Residents, Ages 0-17, 2017-2021




| Total Injury | 16,031 |
|---|---|
| Unintentional | 12,209 |
| Self-Inflicted | 2,570 |
| Assault | 1,840 |
| Undetermined | 238 |
| Legal Intervention | 6 |

* Other includes several smaller defined causes of injury; includes 2% of child injury hospitalizations missing external cause information to describe injury mechanism intent.
Note: Injury mechanism and intent categories are not mutually exclusive, an individual may have multiple injuries documented within a single hospitalization. Limited to residents ages 0-17
Source: NC State Center for Health Statistics, Vital Statistics Hospital Discharge Data (2017-2021)
Analysis by the DPH Injury and Violence Prevention Branch, Injury Epidemiology and Surveillance, and Informatics Unit

# Leading Causes of Injury ED Visits: NC Residents, Ages 0-17, 2017-2021



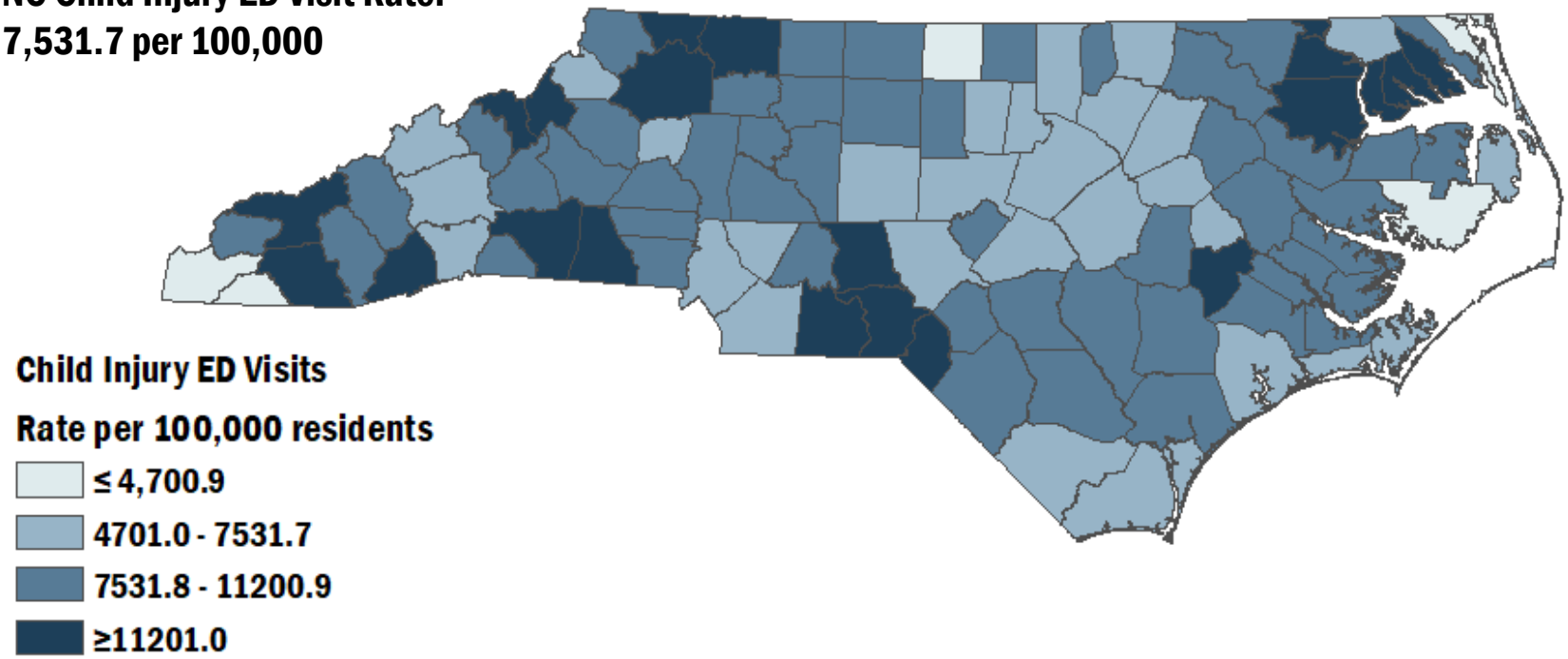

| Total Injury | 867,388 |
|---|---|
| Unintentional | 572,721 |
| Assault | 20,672 |
| Self-Inflicted | 14,084 |
| Undetermined | 3,851 |
| Legal Intervention | 65 |

* Other includes several smaller defined causes of injury
30% of child injury ED visits missing external cause information to describe injury mechanism intent; Limited to residents ages 0-17
Note: Injury mechanism and intent categories are not mutually exclusive, an individual may have multiple injuries documented within a single ED visit.
Source: NC DETECT, ED Visit Data (2017-2021)
Analysis by the DPH Injury and Violence Prevention Branch, Injury Epidemiology and Surveillance, and Informatics Unit

# Injury ED visit rates among children varied drastically by county

## Child Injury ED Visit Rates by County of Residence, 2017-2021

**NC Child Injury ED Visit Rate:**
**7,531.7 per 100,000**




Limited to residents ages 0-17
Source: NC DETECT, ED Visit Data (2017-2021)
Analysis by the DPH Injury and Violence Prevention Branch, Injury Epidemiology and Surveillance, and Informatics Unit

# Top 5 Deaths, Hosp and ED visits for 0-17

**Top 5 Leading Causes of Injury Death, Hospitalization, and Emergency Department Visits by County***
**Ages 0 to 17, 2016-2020**

| Leading Causes of Injury Death 2016 to 2020 ORANGE | | |
|---|---|---|
| **Rank** | **Cause** | **#** |
| 1 | Pedestrian Other - Unintentional | 2 |
| 2 | Unspecified - Assault; Suffocation - Unintentional; Suffocation - Undetermined; Suffocation - Self-Inflicted; Other Transport - Unintentional; MVT - Unintentional; Firearm - Self-Inflicted; Drowning/Submersion - Assault; Cut/Pierce - Assault | 1 |
| 3 | | |
| 4 | | |
| 5 | | |
| **TOTAL** | | **11** |

| Leading Causes of Injury Hospitalization 2016 to 2020 ORANGE | | |
|---|---|---|
| **Rank** | **Cause** | **#** |
| 1 | Fall - Unintentional | 40 |
| 2 | Poisoning - Self-Inflicted | 30 |
| 3 | Fire/Burn - Unintentional | 29 |
| 4 | MVT - Unintentional | 21 |
| 5 | Other Specified/Classifiable - Assault | 19 |
| **TOTAL** | | **187** |

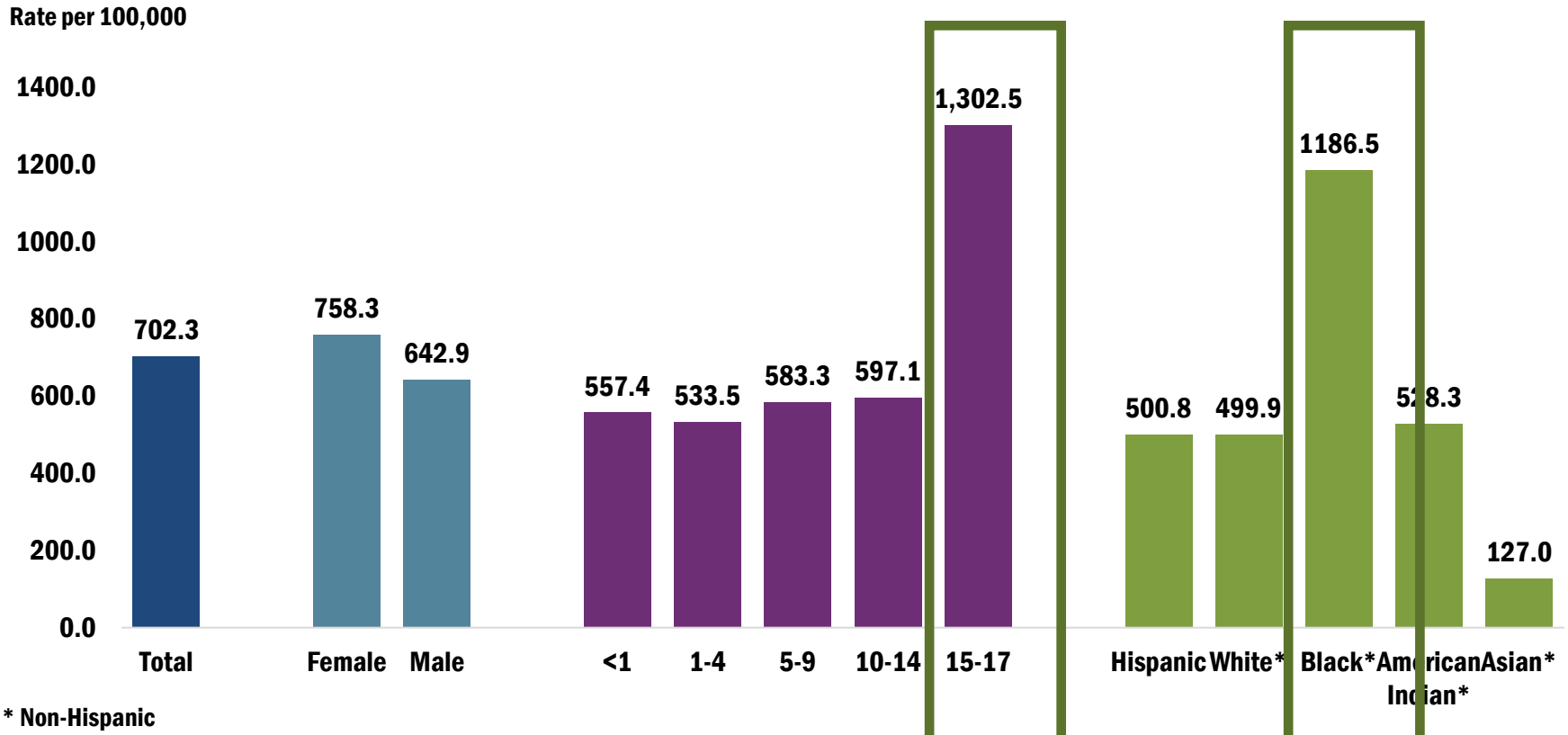
| Leading Causes of Injury ED Visits 2016 to 2020 ORANGE | | |
|---|---|---|
| **Rank** | **Cause** | **#** |
| 1 | No Mechanism or Intent Recorded | 3,853 |
| 2 | Fall - Unintentional | 1,234 |
| 3 | MVT - Unintentional | 446 |
| 4 | Other Specified/Classifiable - Unintentional | 439 |
| 5 | Natural/Environmental - Unintentional | 404 |
| **TOTAL** | | **7,941** |

https://injuryfreenc.dph.ncdhhs.gov/DataSurveillance/pdf/Top5TablesByCounty2016-2020_ages0-17.pdf

# Overview- MVT Injury ED Visits

# MVT injury rates are highest for youth ages 15-17 and non-Hispanic Black youth

## Motor Vehicle Traffic ED Visit Rates among NC Children by Demographic Group, 2017-2021



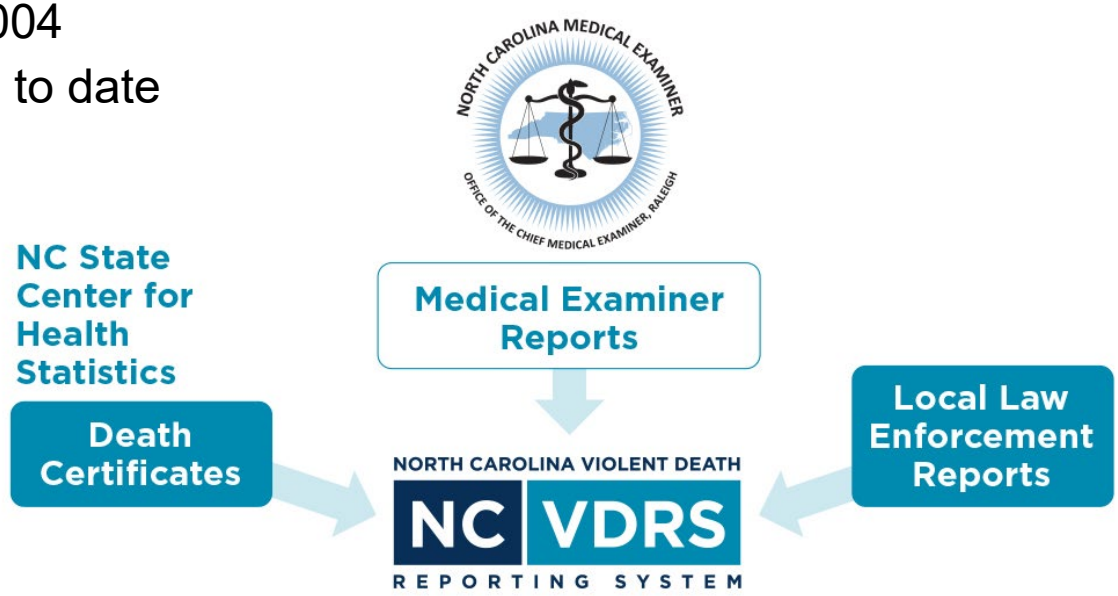

* Non-Hispanic

Limited to NC residents ages 0-17
Source: NC DETECT Emergency Department (ED) Visit Data, 2017-2021

# Overview- NC-VDRS

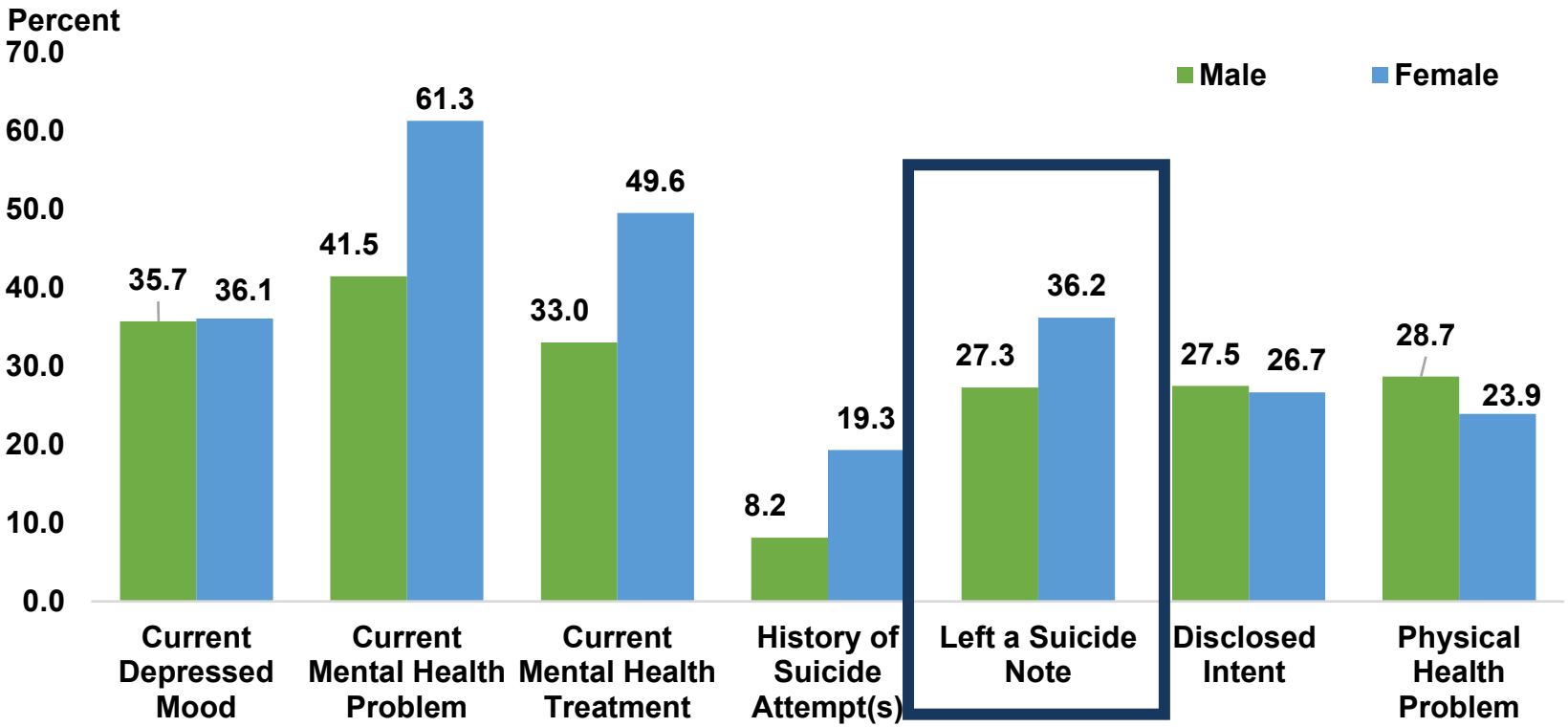
# NC-VDRS
## North Carolina-Violent Death Reporting System

- **CDC-funded statewide surveillance system** collecting data on deaths resulting from violence such as homicide, suicide, legal intervention
- **Funded in 2003**
  - Data collection began in 2004
  - ~35,000 incidents reported to date
- **Multi-sourced incident-based system**



# A quarter of all firearm related suicide victims tell someone or disclose their intent

## Circumstance of Firearm Related Suicides in NC by Sex, 2011-2020 (ages 10-17)

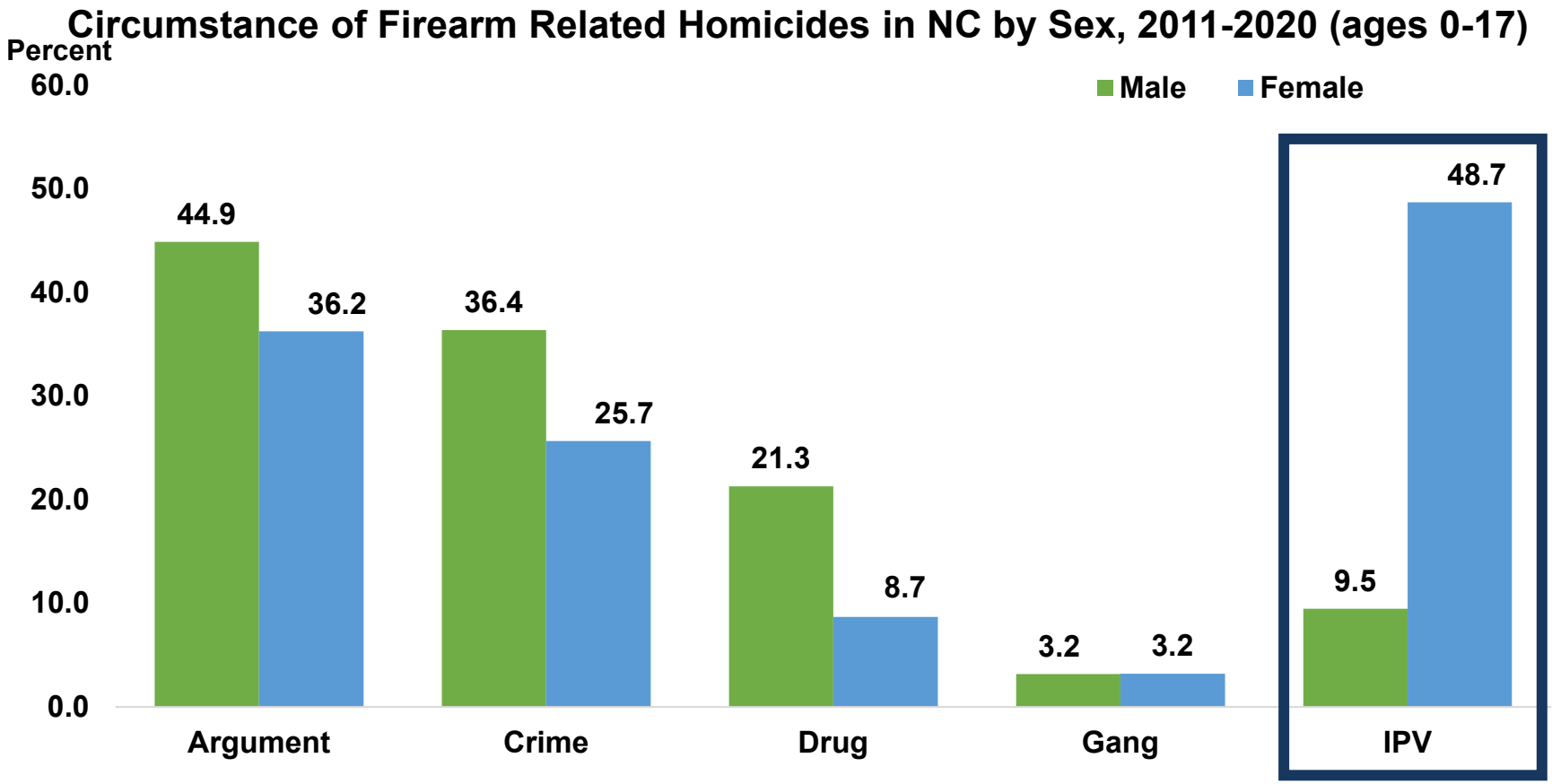



Limited to NC residents ages 10 and older
Source: NC-VDRS, 2011-2020 (downloaded Feb 20, 2023)
Analysis by Injury Epidemiology, Surveillance and Informatics (ESI) Unit

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES Division of Public Health

NORTH CAROLINA VIOLENT DEATH NC VDRS REPORTING SYSTEM

# Nearly half of all firearm related female homicides are a result of intimate partner violence



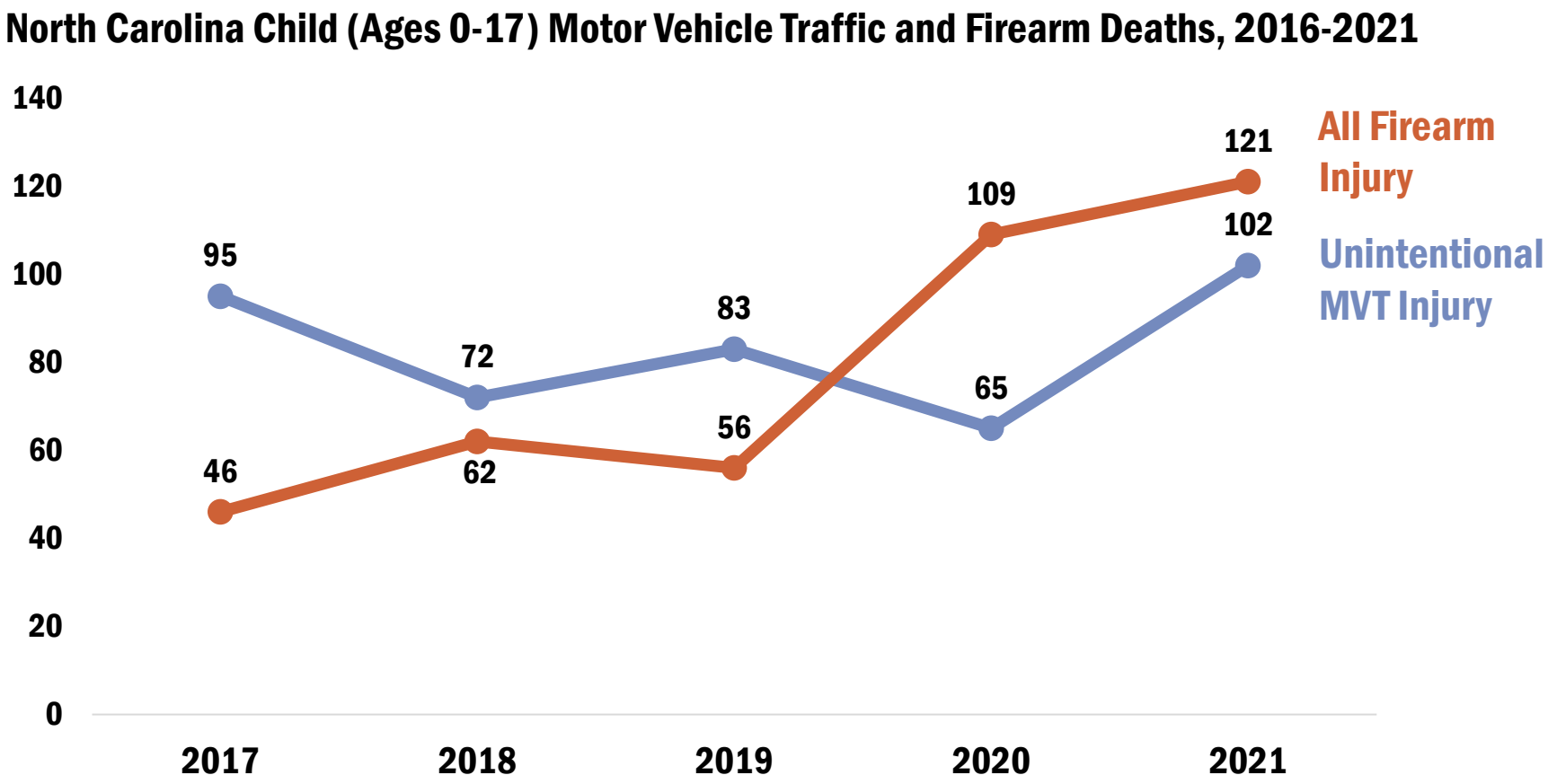

Limited to NC residents ages 10 and older
Source: NC-VDRS, 2011-2020 (downloaded Feb 20, 2023)
Analysis by Injury Epidemiology, Surveillance and Informatics (ESI) Unit

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

NORTH CAROLINA VIOLENT DEATH REPORTING SYSTEM
NC VDRS

# Overview- Firearm Deaths and Injuries

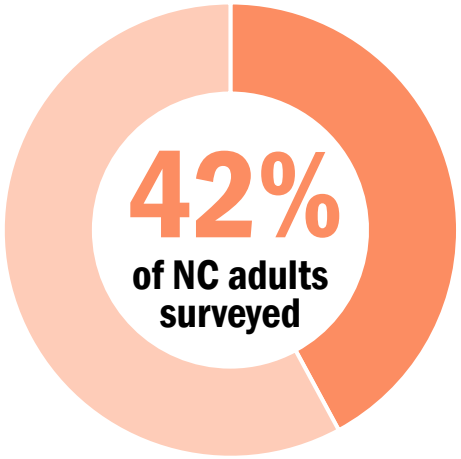
# Child Firearm deaths surpassed MVT injury deaths in 2020 and 2021.



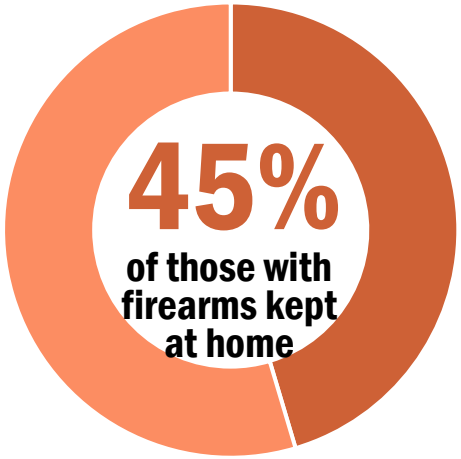

Limited to residents ages 0-17
Source: NC State Center for Health Statistics, Vital Statistics Deaths (2017-2021)
Analysis by the DPH Injury and Violence Prevention Branch, Injury Epidemiology and Surveillance, and Informatics Unit

# More than 2/5 of NC adults have a firearm in or around the home. Over half of firearms that are stored loaded are also unlocked.

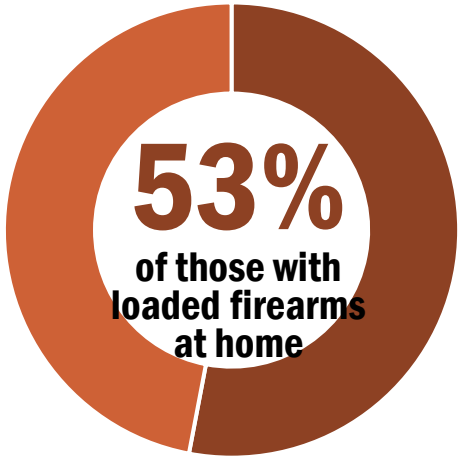
**Firearms Kept In or Around the Home**




**Any of These Firearms are Currently Loaded**




**Firearms that are Loaded and Unlocked**




## High school students reported they could readily obtain a loaded firearm within an hour

**NC BRFSS Firearm Safety Module, 2021** https://schs.dph.ncdhhs.gov/data/brfss/2021/nc/all/topics.htm#fr

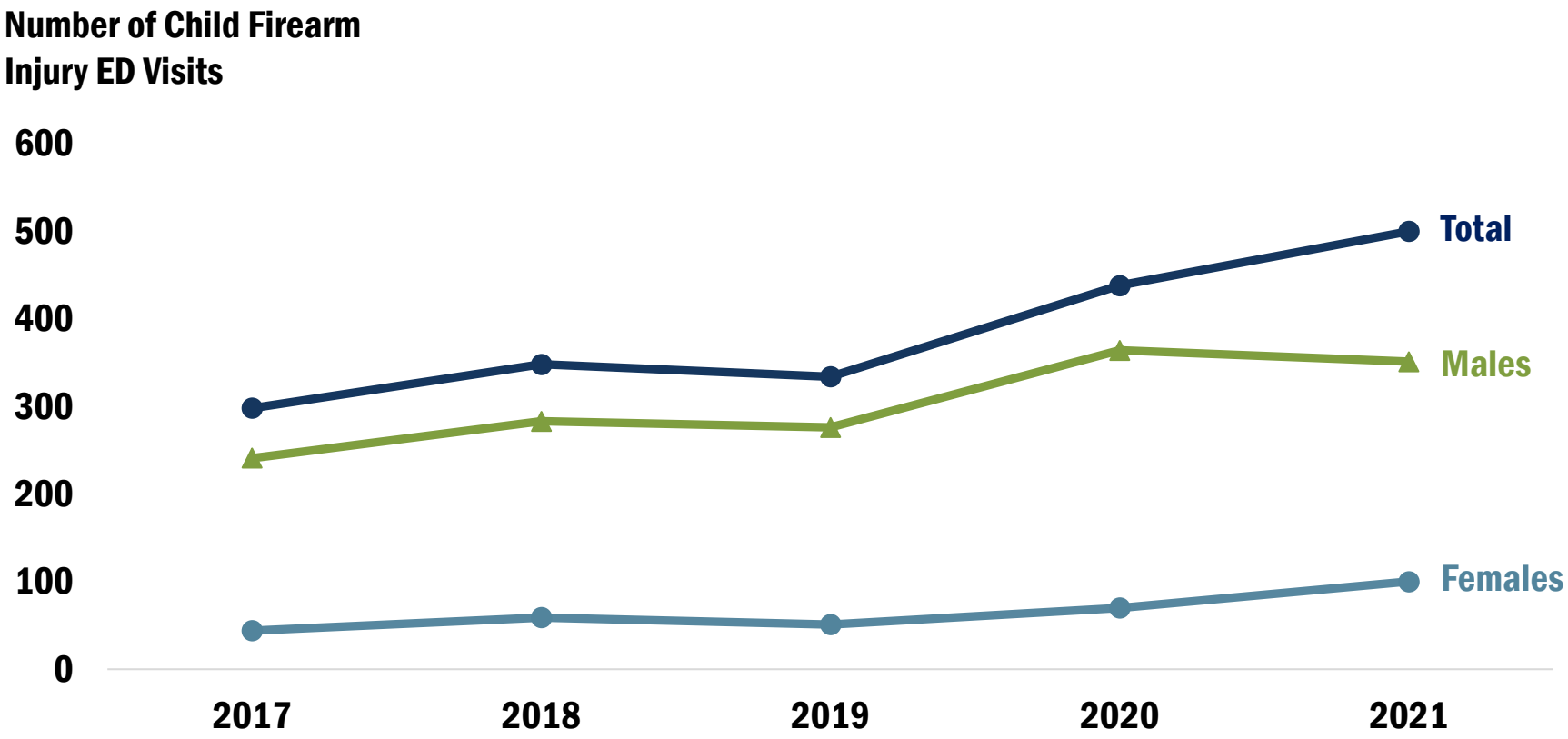
# Overview-NC-FASTER/AVERT (nonfatal firearm and violence)

# NC-FASTER
## Firearm Injury Surveillance Through Emergency Rooms


- **NC is one of 10 states funded** for enhanced surveillance of non-fatal firearm injuries
- **3-year award,** started September 1, 2020

| SRATEGY 1 | STRATEGY 2 |
|---|---|
| • **Increase the timeliness** of ED visits for firearm injuries reporting.<br>• **Increase availability** of rapid, reliable, and geographically-specific surveillance data on ED visits for nonfatal firearm injuries.<br>• **Improve** firearm injury syndromic **surveillance methodology**. | • **Disseminate surveillance findings** to key stakeholders. |

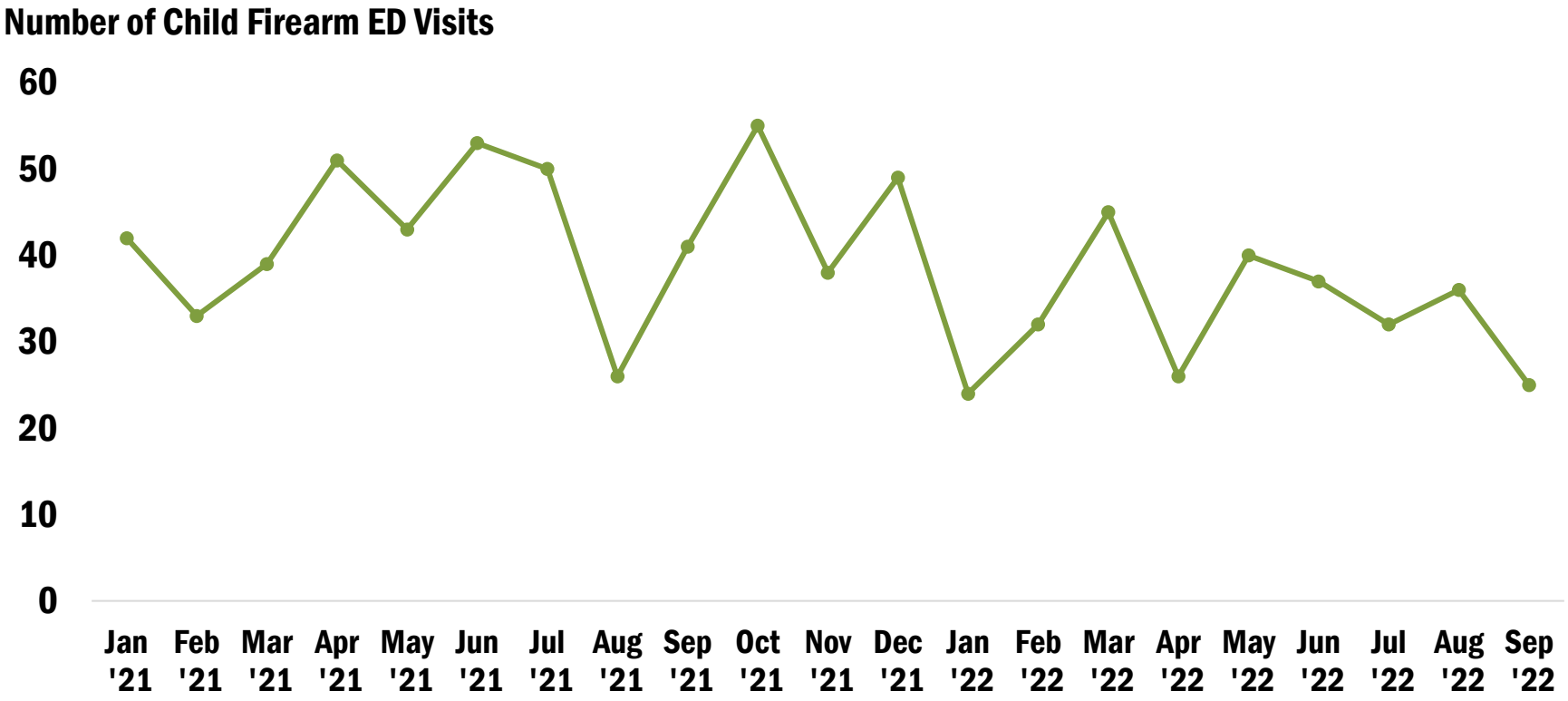
# Child (ages 0-17) ED visits for firearm injury have increased by 71% from 2017-2021*.




*Note: Overall ED visits among children (any cause) decreased by 29% in 2020 compared to 2019 and remained 24% lower in 2021.
Data limited to North Carolina Residents ages 0-17
Source: NC DETECT Emergency Department (ED) Visit Data, 2017-2021

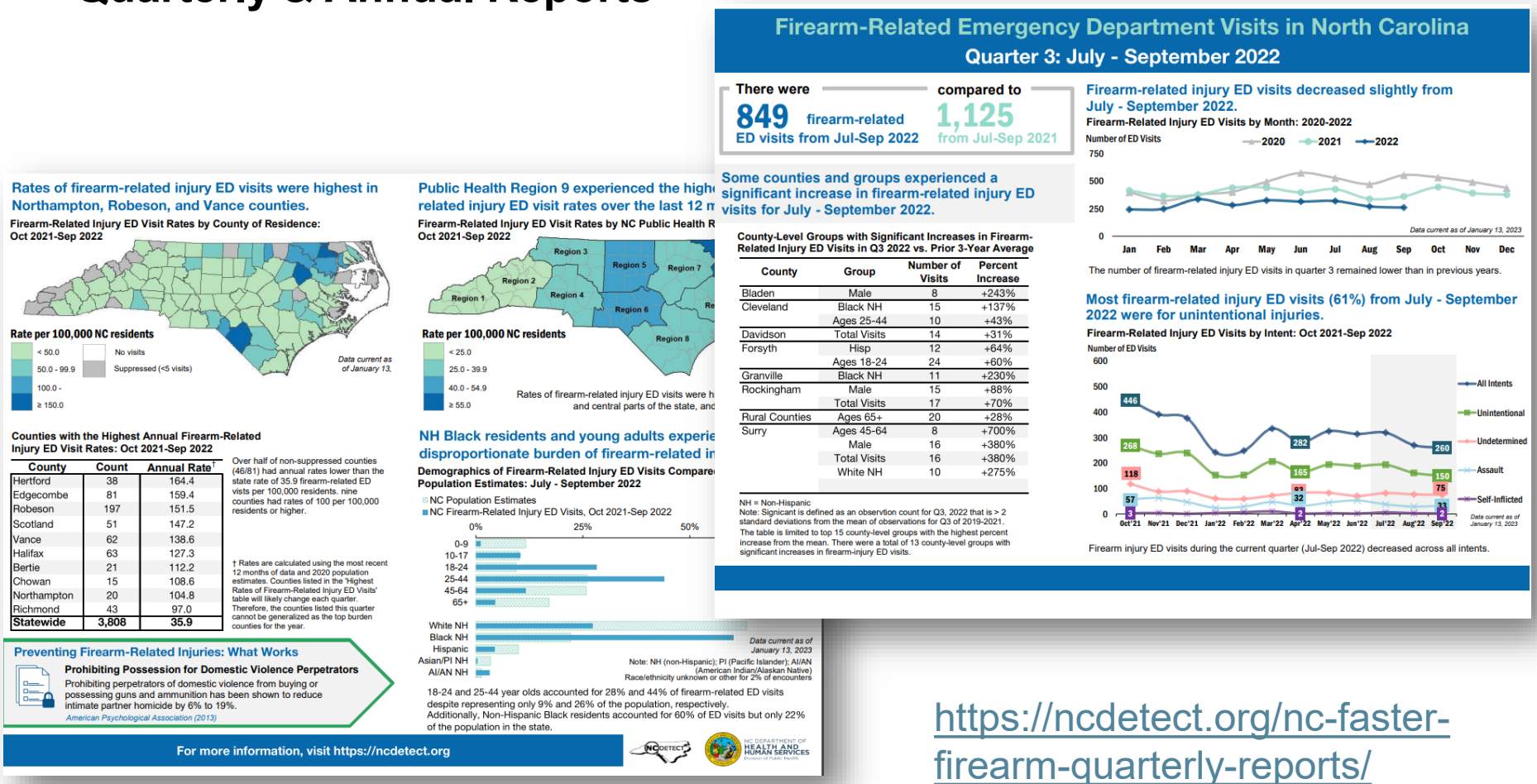
# Between 24 and 55 firearm injury ED visits* occur among youth 0-17 on

**NC FASTER Firearm ED Visits, Ages 0-17, All intents, January 2021-September 2022**




*Note: NC FASTER CDC V2 All Intent Firearm ED Visits, includes free text search in addition to ICD-10-CM codes.
Data limited to North Carolina Residents ages 0-17
Source: NC DETECT, NC FASTER Firearm ED Visit Data, 2017-2021

# NC-FASTER Data Products
## Quarterly & Annual Reports



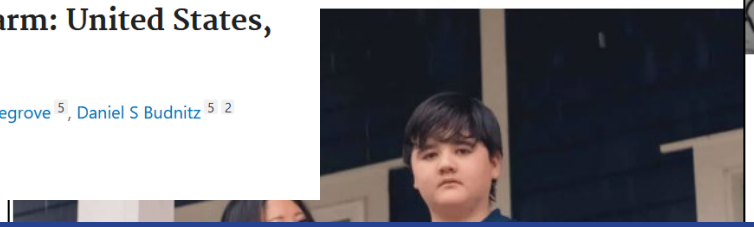

https://ncdetect.org/nc-faster-firearm-quarterly-reports/

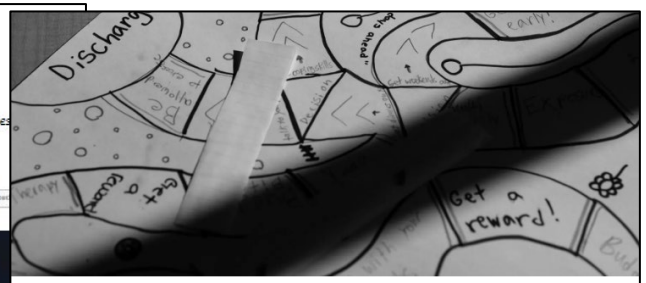
# Overview-Syndromic Surveillance System (SyS)

# Syndromic Surveillance – Mental/Behavioral Health

## Mental health patients fill the ER, waiting weeks for help

*Due to a lack of mental health community services, more patients are languishing in emergency departments — sometimes up somewhere in North Carolina.*






## *Hundreds of Suicidal Teens Sleep in Emergency Rooms. Every Night.*

ent psychiatric services in short supply, are spending days, even weeks, in hospital departments awaiting the help they need.

> Inj Prev. 2022 Aug 3;ip-2022-044620. doi: 10.1136/ip-2022-044620. Online ahead of print.

## National estimates of emergency department visits for medication-related self-harm: United States, 2016–2019

Andrew I Geller [1 2], Daniel C Ehlman [3 4], Maribeth C Lovegrove [5], Daniel S Budnitz [5 2]

Affiliations + expand

PMID: 35922136 DOI: 10.1136/ip-2022-044620

Morbidity and Mortality Weekly Report (*MMWR*)

CDC

## Pediatric Emergency Department Visits Before and During the COVID-19 Pandemic —

*Weekly* / February 25, 2022

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MENTAL HEALTH

## New mental health data show 'unsustainable' burden on NC hospitals

*Rising mental health-related emergency room visits, more involuntary commitments and longer wait times for psychiatric hospital beds are symptoms of much larger problems within the state's mental health system, health experts say.*

by Taylor Knopf
August 22, 2022

Facebook | Twitter | LinkedIn | Email

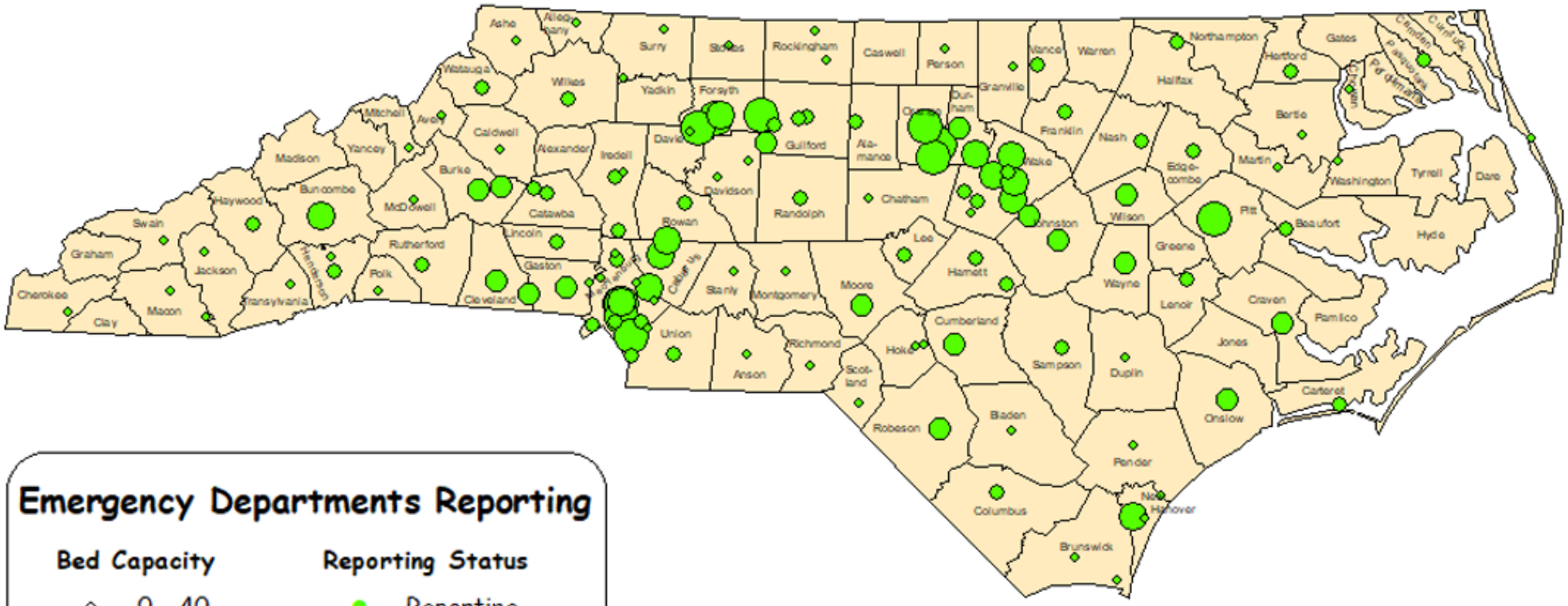
tment Visits Related to Mental
8 Years, by Disorder Category† —
Care Survey, United States,

# Syndromic Surveillance (SyS)

- **Using real-time data to understand what is happening to a community's health**
  - **Infectious Diseases >20 years- since 9/11 & anthrax)**
  - **Injuries (~10 year in NC but minimal until overdose)**
  - **Natural and man-made disasters (Hurricanes and winter storms)**
  - **Mass gatherings**
- **Focus is on timeliness over specificity**
- **In the U.S., the most common data source is emergency department (ED) data (limited dataset)**
- **Key words and/or ICD10-CM based**

Source: slide provided by Carolina Center for Health Informatics / NC DETECT https://ncdetect.org

# Emergency Departments (EDs) Reporting to NC DETECT by General Bed Capacity




**Emergency Departments Reporting**

| Bed Capacity | Reporting Status |
|---|---|
| 0 - 40 | Reporting |
| 41 - 70 | Test Mode |
| 71 - 110 | County |
| 111 - 300 | |
| more than 300 | |

- **130 civilian EDs reporting 3x/day**
- **NC DETECT processing & adding syndromes con-currently**
- **Teams systematically reviewing**

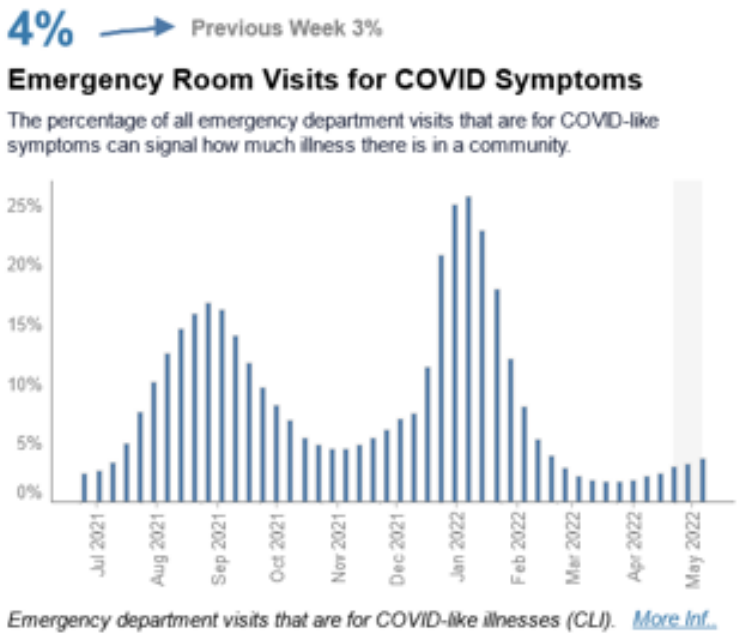
Source: NC State Center for Health Statistics
Data as of March 15, 2022

# SyS is already at work in NC.

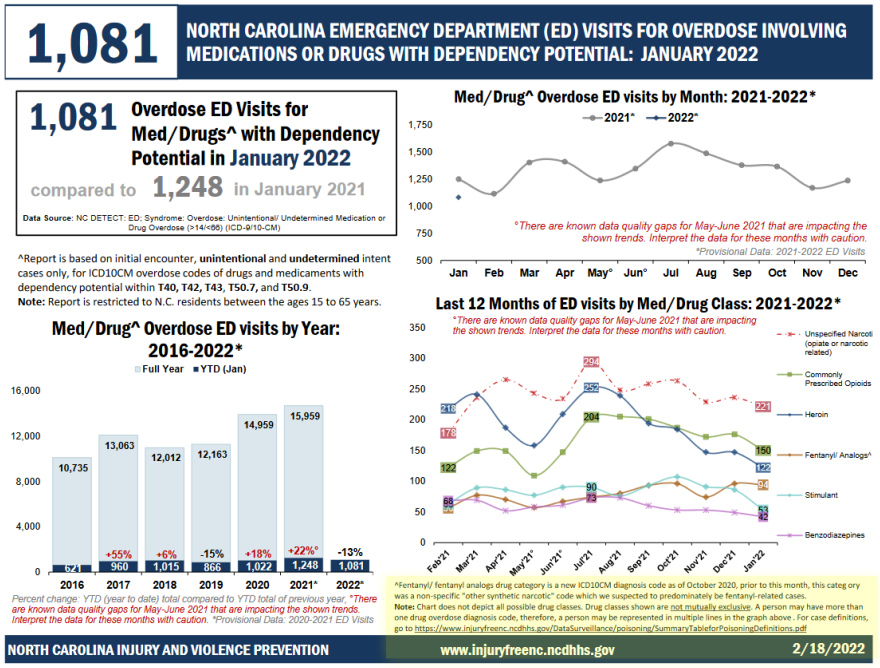
## Early Warning Indicators

Rising levels of these can be an early sign of community spread and illness.

### COVID-like illness




### Medication/Drug Overdose




Source: slide provided by Carolina Center for Health Informatics / NC DETECT https://ncdetect.org

# NC DETECT ED Case Definitions in Development or Currently Planned

## Suicide Attempts

**Currently only have a code-based self-harm definition.** Categorized by behavioral health diagnostic groupings:

- mood/anxiety
- psychotic
- substance use disorder
- etc.

## Cannabis-Related Harm

Especially important to **establish baselines** given potential for medically legalized cannabis in NC

## Alcohol-Related Harm

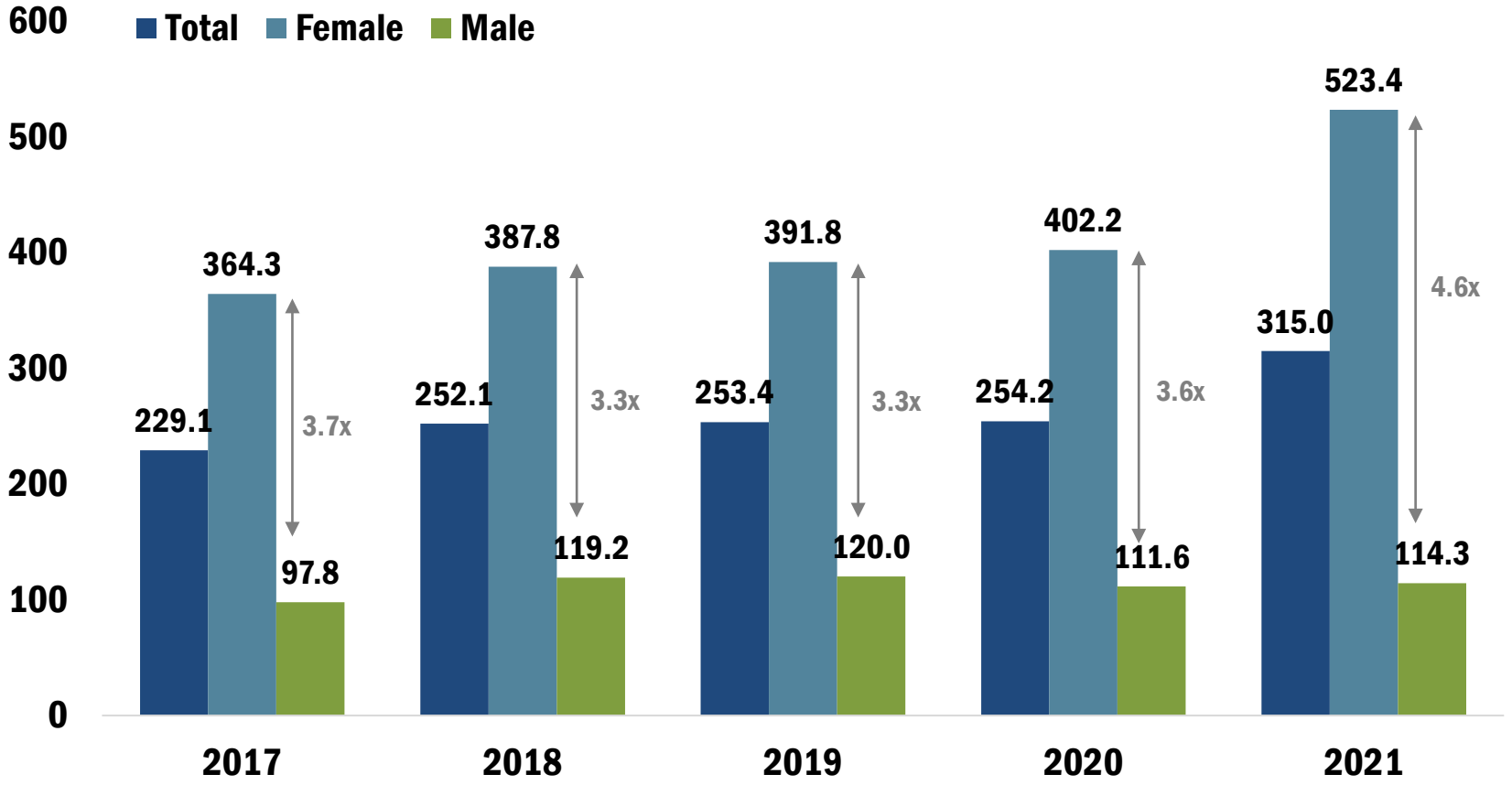
Especially important given the **increase in alcohol sales and use** during the pandemic

All three case definitions would also be categorized by age, gender, payor source, and county/region.

# Self-Harm ED Visit Data

# The ratio of self-harm ED visits between females and males increased in 2021

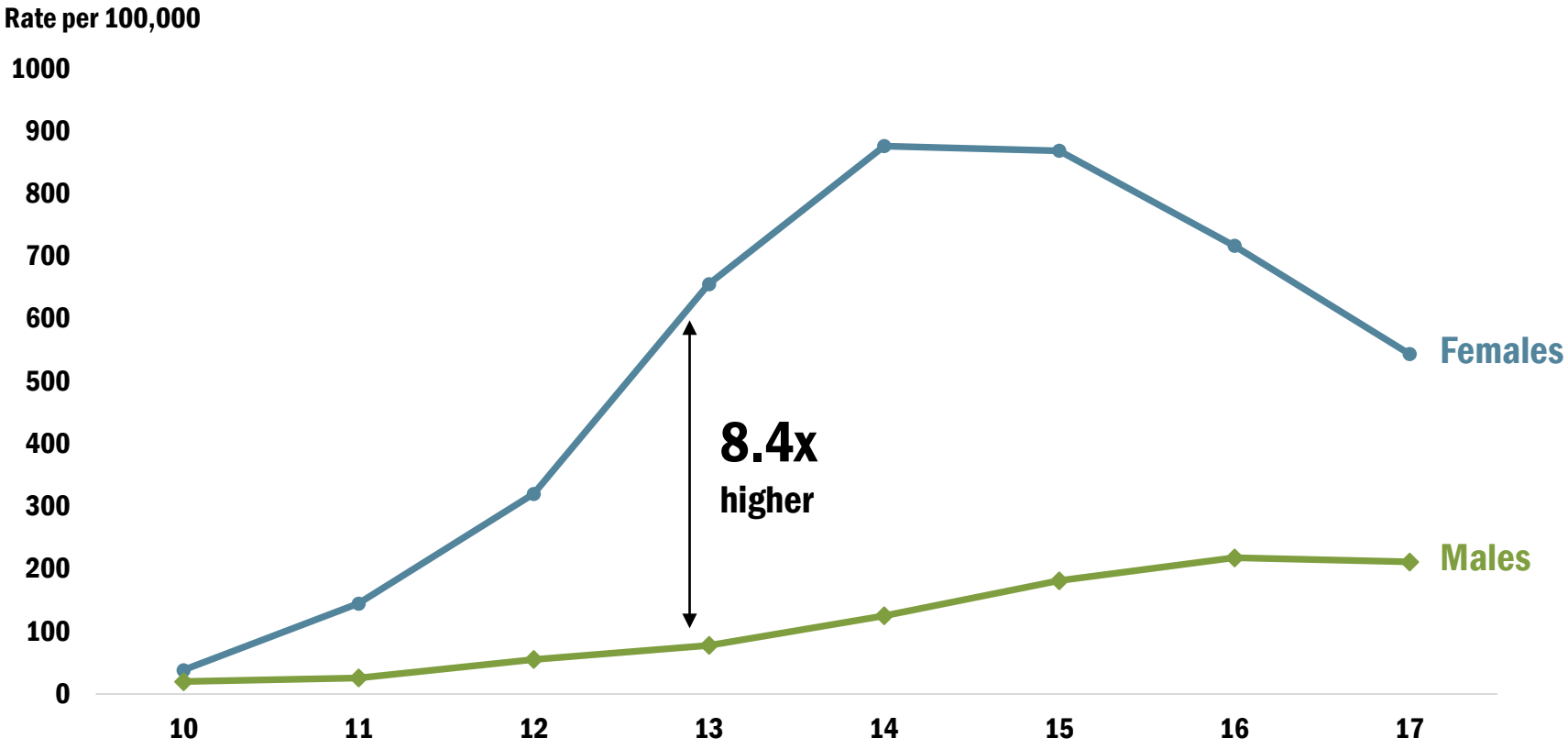
**Crude Self-Harm ED Visit Rates per 100,000, Ages 10-17, 2017-2021**




Limited to NC residents ages 0-17
Source: NC DETECT Emergency Department (ED) Visit Data, 2017-2021

# Self-harm ED visit rates are 8.4x higher among 13-year-old females than males

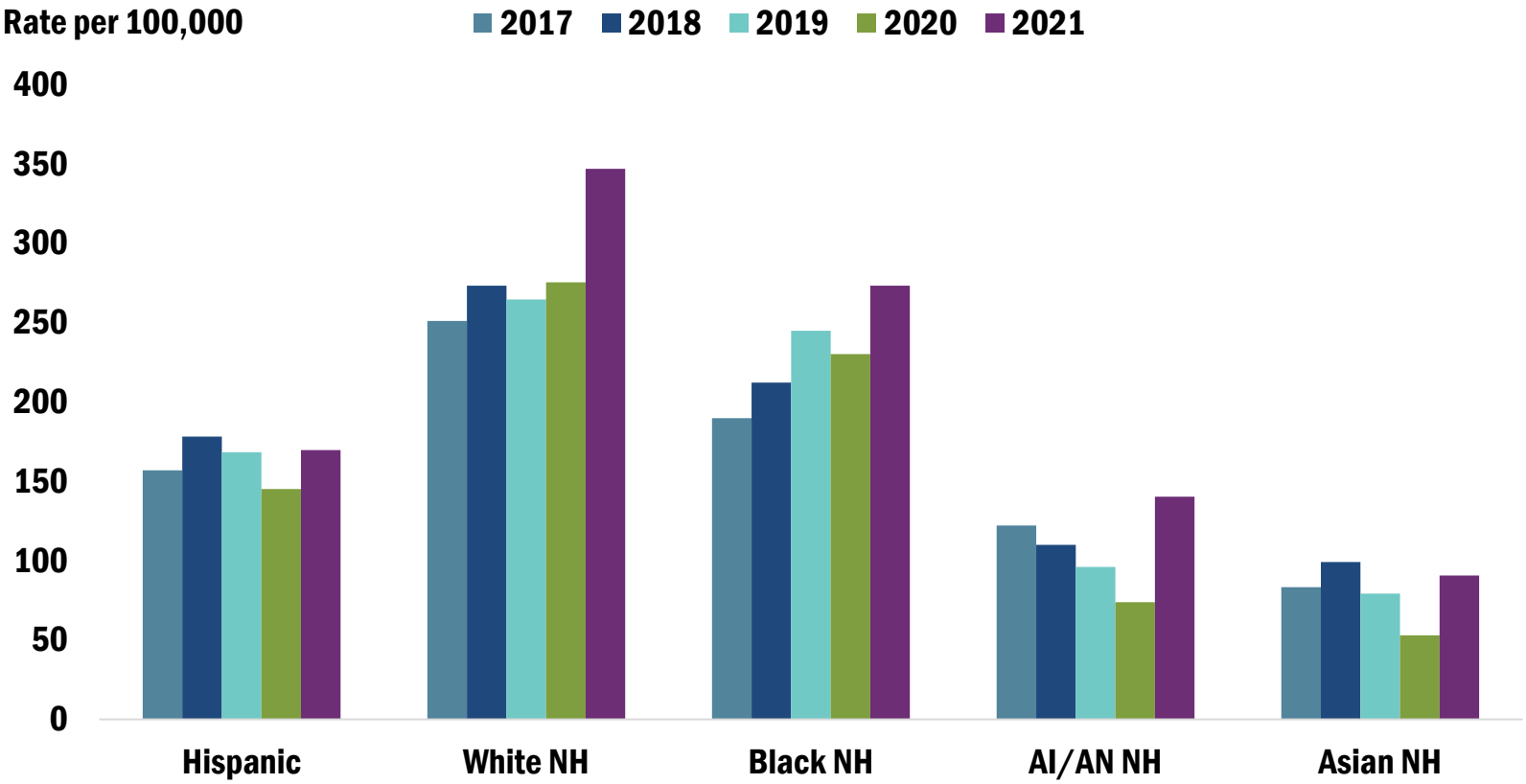
**Crude Self-Harm ED Visit Rates per 100,000, by Sex and Age, Ages 10-17, 2017-2021**




Limited to NC residents ages 0-17
Source: NC DETECT Emergency Department (ED) Visit Data, 2017-2021

# Rates of self-inflicted injury increased for youth among all race/ethnicities in 2021.

**Crude Self-Harm ED Visit Rates per 100,000, Ages 10-17 by Race/Ethnicity, 2019-2021**

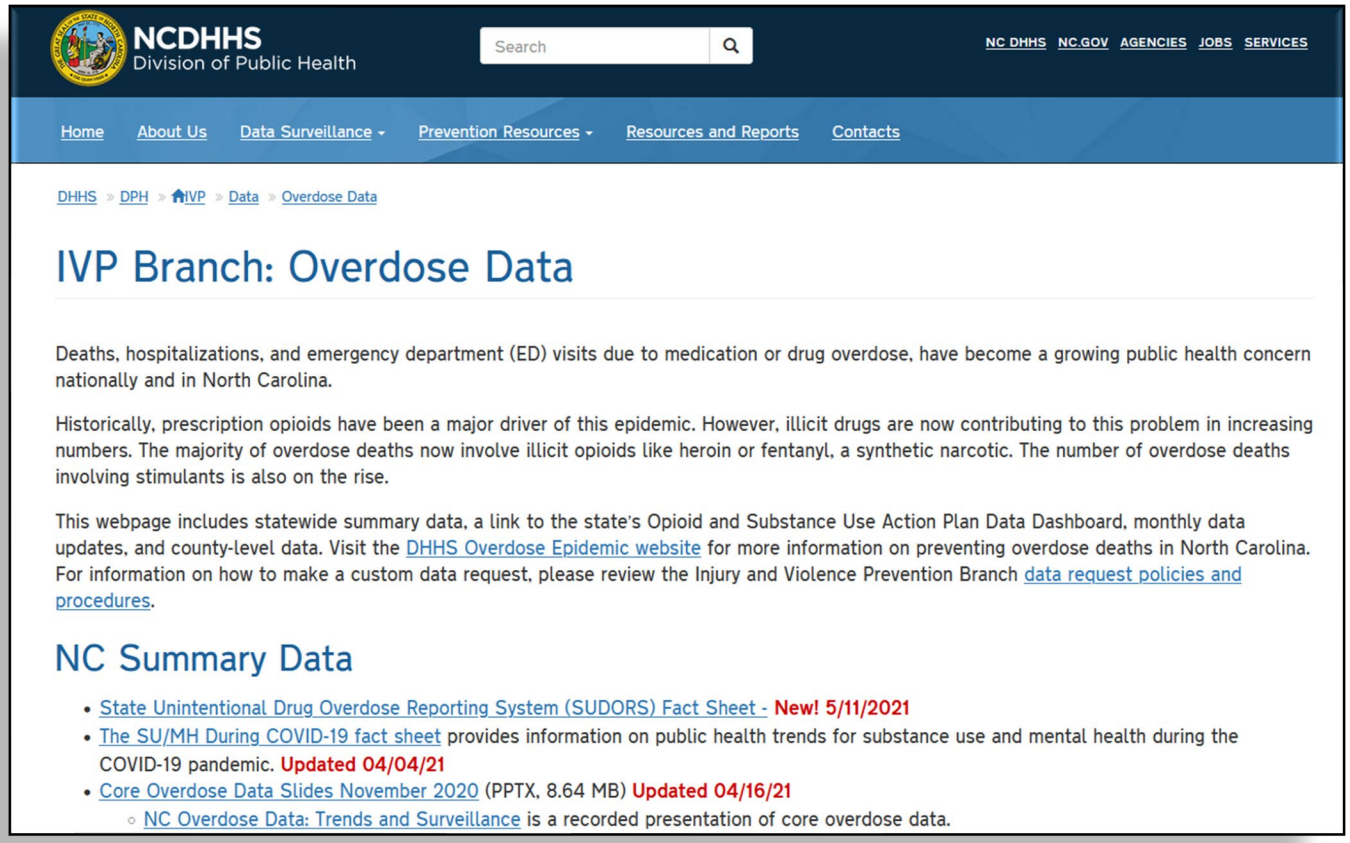



NH – Non-Hispanic
Limited to NC residents ages 0-17
Source: NC DETECT Emergency Department (ED) Visit Data, 2017-2021

# Injury Surveillance and Data Resources

injuryfreenc.dph.ncdhhs.gov/DataSurveillance

# Additional Resources



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DHHS » DPH » IVP » Data » Overdose Data

## IVP Branch: Overdose Data

Deaths, hospitalizations, and emergency department (ED) visits due to medication or drug overdose, have become a growing public health concern nationally and in North Carolina.

Historically, prescription opioids have been a major driver of this epidemic. However, illicit drugs are now contributing to this problem in increasing numbers. The majority of overdose deaths now involve illicit opioids like heroin or fentanyl, a synthetic narcotic. The number of overdose deaths involving stimulants is also on the rise.

This webpage includes statewide summary data, a link to the state's Opioid and Substance Use Action Plan Data Dashboard, monthly data updates, and county-level data. Visit the DHHS Overdose Epidemic website for more information on preventing overdose deaths in North Carolina. For information on how to make a custom data request, please review the Injury and Violence Prevention Branch data request policies and procedures.

## NC Summary Data

- State Unintentional Drug Overdose Reporting System (SUDORS) Fact Sheet - **New! 5/11/2021**
- The SU/MH During COVID-19 fact sheet provides information on public health trends for substance use and mental health during the COVID-19 pandemic. **Updated 04/04/21**
- Core Overdose Data Slides November 2020 (PPTX, 8.64 MB) **Updated 04/16/21**
  - NC Overdose Data: Trends and Surveillance is a recorded presentation of core overdose data.

Core Overdose Slides

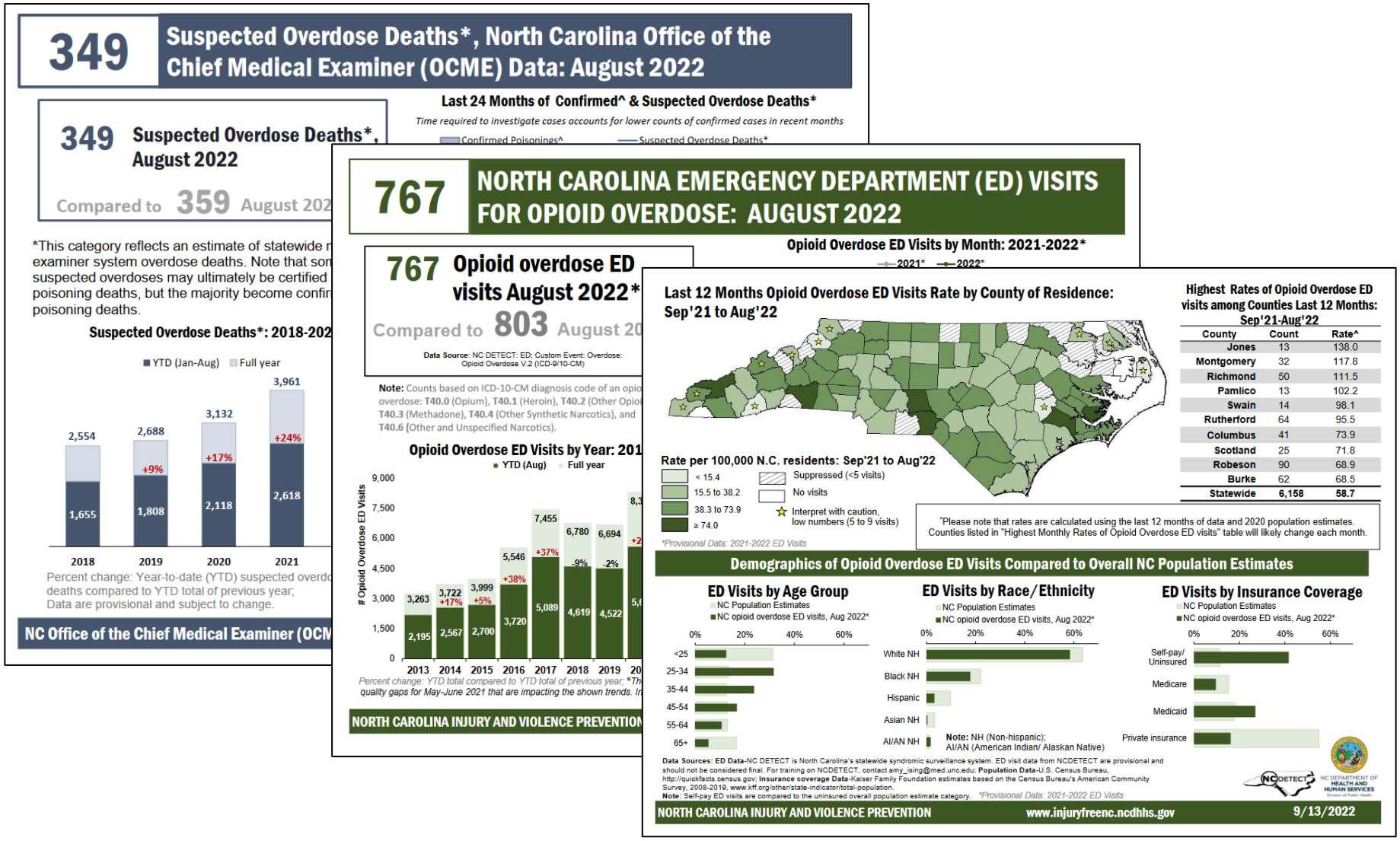
County-level Slides

Factsheets

Deaths, ED, and Hosp by county and drug

SubstanceUseData@dhhs.nc.gov

# Monthly Surveillance Reports

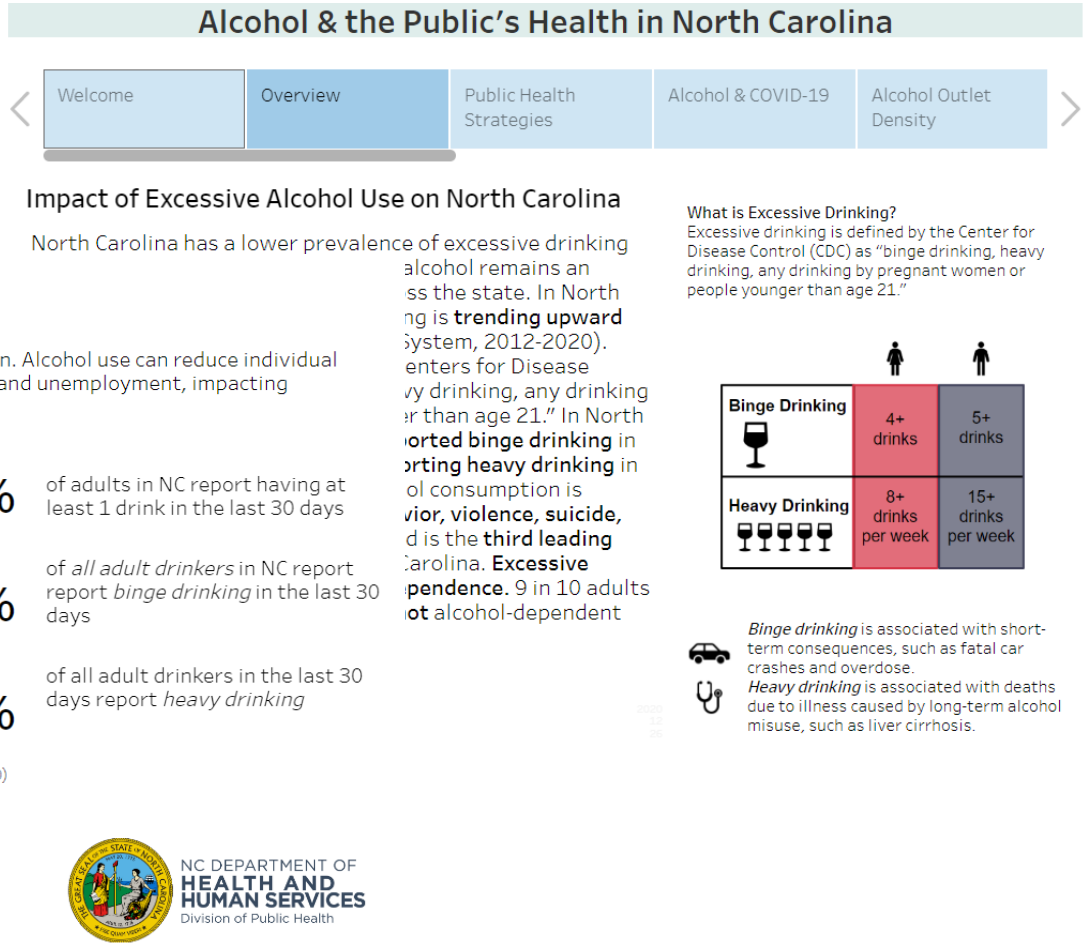


# NC-VDRS Data Dashboard

## Use your phone and open our dashboard!


NORTH CAROLINA VIOLENT DEATH
NC VDRS
REPORTING SYSTEM

# Alcohol Dashboard




**https://dashboards.ncdhhs.gov/t/DPH/views/AlcoholDashboard_2020Update_04042021/Story?%3Aembed=y&%3AisGuestRedirectFromVizportal=y**

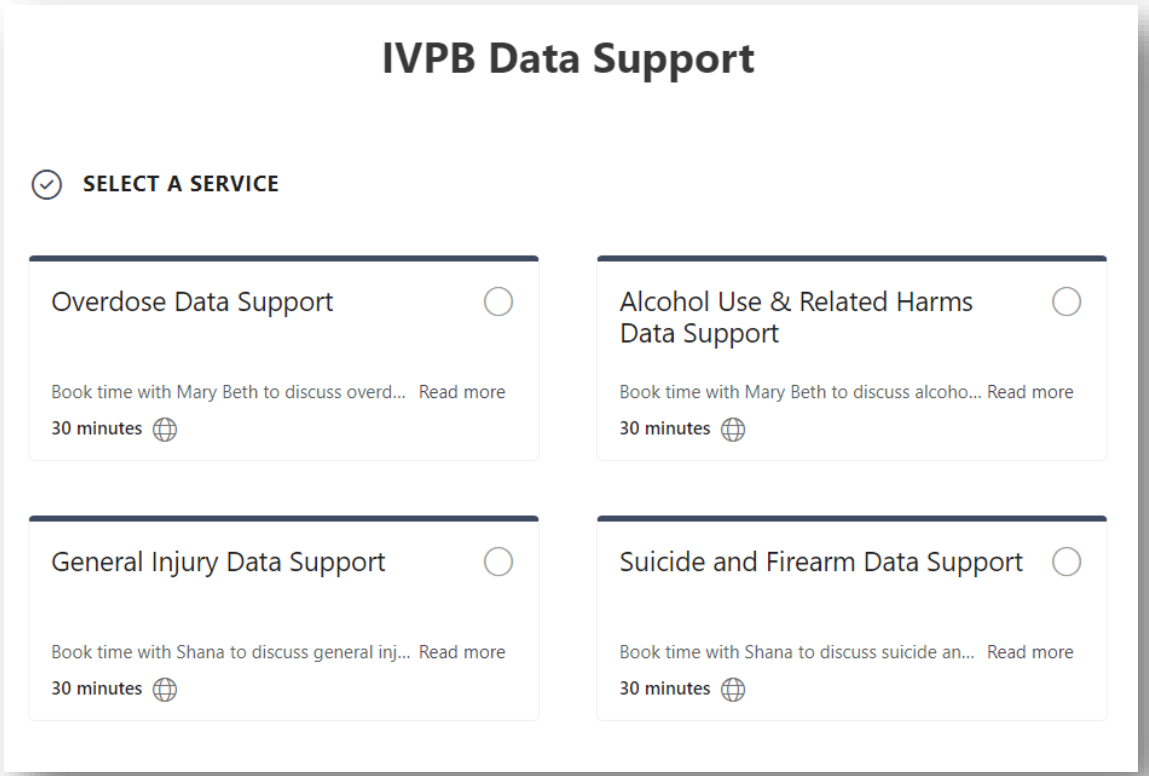
# Where to find data on suicide/self-harm?

- **NC Injury and Violence Prevention Branch Suicide Data Page**
  - **NC-VDRS Annual Report**
  - **NC-VDRFS Fact Sheets**
  - **NC-VDRS Data Dashboard**
  - **NC DETECT Self-Inflicted Injury Report**
- **State Center for Health Statistics (SCHS) Death Certificate Data**
  - **NC Health Data Query System**
- **CDC WISQARS – Fata Injury and Violence Data**

# IVPB Data Support now available!

Book time with an IVPB epidemiologist to discuss available data products, to talk through custom data requests, or for general data questions.

- IVPB Data Request Policy
- IVPB Data Support Bookings



# Thx!

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Scott.Proescholdbell@dhhs.nc.gov

www.injuryfreenc.ncdhhs.gov