

# Epidemiology of Suicide and Suicidal Behavior



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# Disclosures

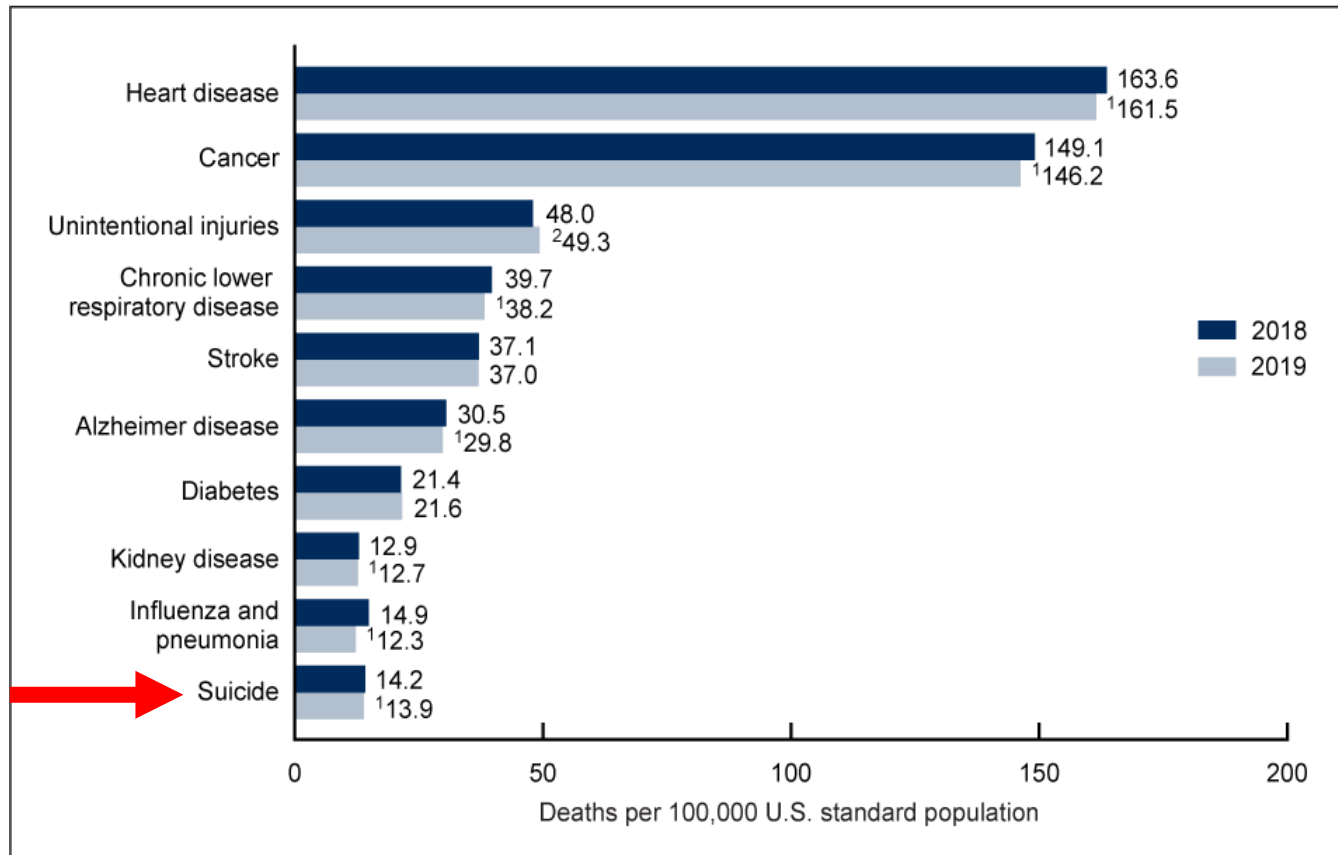
- I receive research grant funding from the National Institute of Mental Health (NIMH), the Centers for Disease Control and Prevention (CDC), and the Patient-Centered Outcomes Research Institute (PCORI)
- Scientific Advisory Board of Clarigent Health

# Overview

- National trends in suicide / suicidal behavior
- Subgroups
  - American Indian/Alaskan Native
  - Black youth; Pre-teens; Sexual identity
  - Rural vs. Urban
- COVID-19 / Black Lives Matter / Racism
- Opportunities and Challenges

# Suicide was the 10<sup>th</sup> Leading Cause of Death in U.S. in 2019

Figure 4. Age-adjusted death rates for the 10 leading causes of death in 2019: United States, 2018 and 2019



<sup>1</sup>Statistically significant decrease in age-adjusted death rate from 2018 to 2019 ( $p < 0.05$ ).

<sup>2</sup>Statistically significant increase in age-adjusted death rate from 2018 to 2019 ( $p < 0.05$ ).

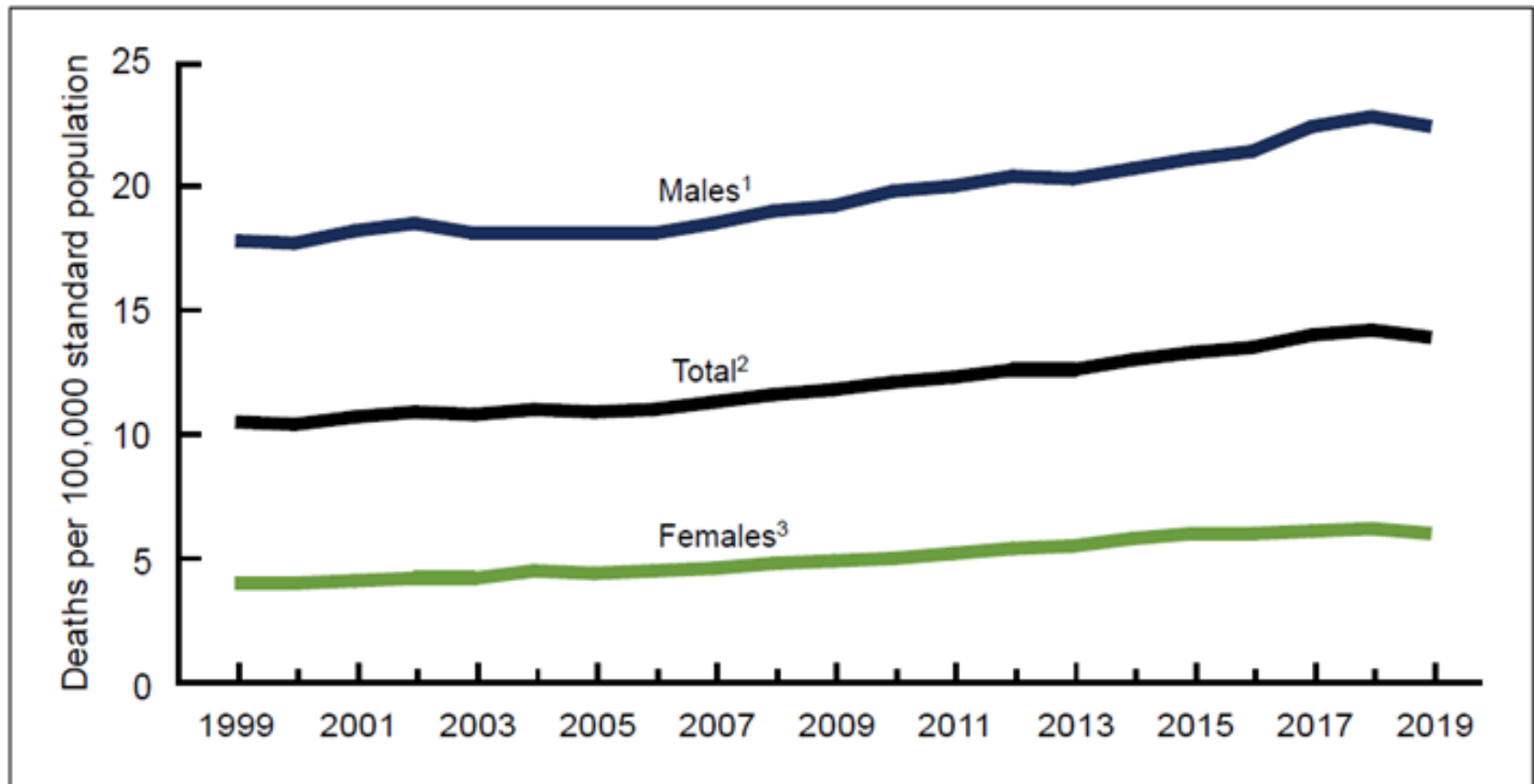
NOTES: A total of 2,854,838 resident deaths were registered in the United States in 2019. The 10 leading causes of death accounted for 73.4% of all deaths in the United States in 2019. Causes of death are ranked according to number of deaths. Rankings for 2018 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes. Access data table for Figure 4 at: <https://www.cdc.gov/nchs/data/databriefs/db395-tables-508.pdf#4>.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

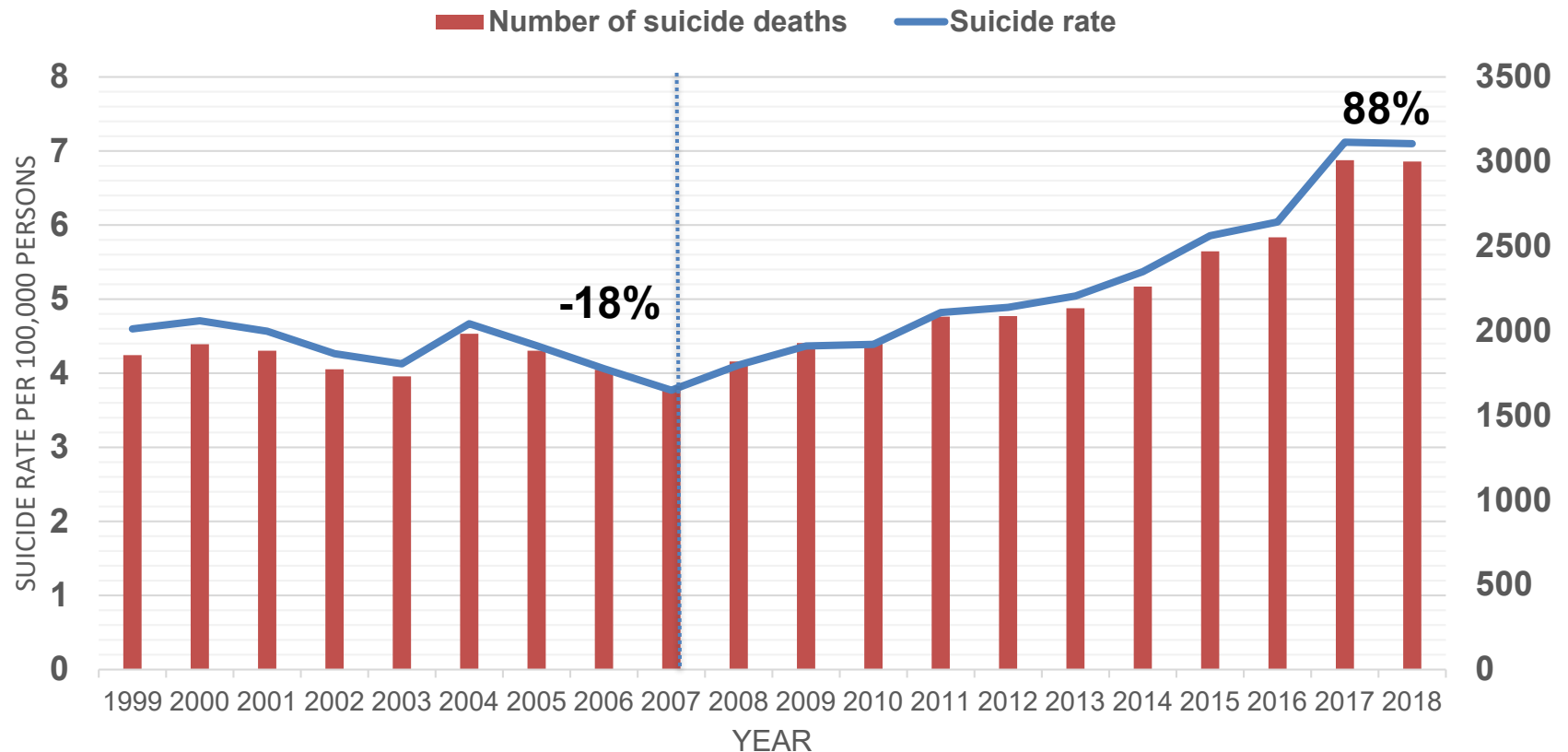
# Age-adjusted Suicide Rates by Sex US 1999-2019

## Suicide Mortality in the United States, 1999–2019

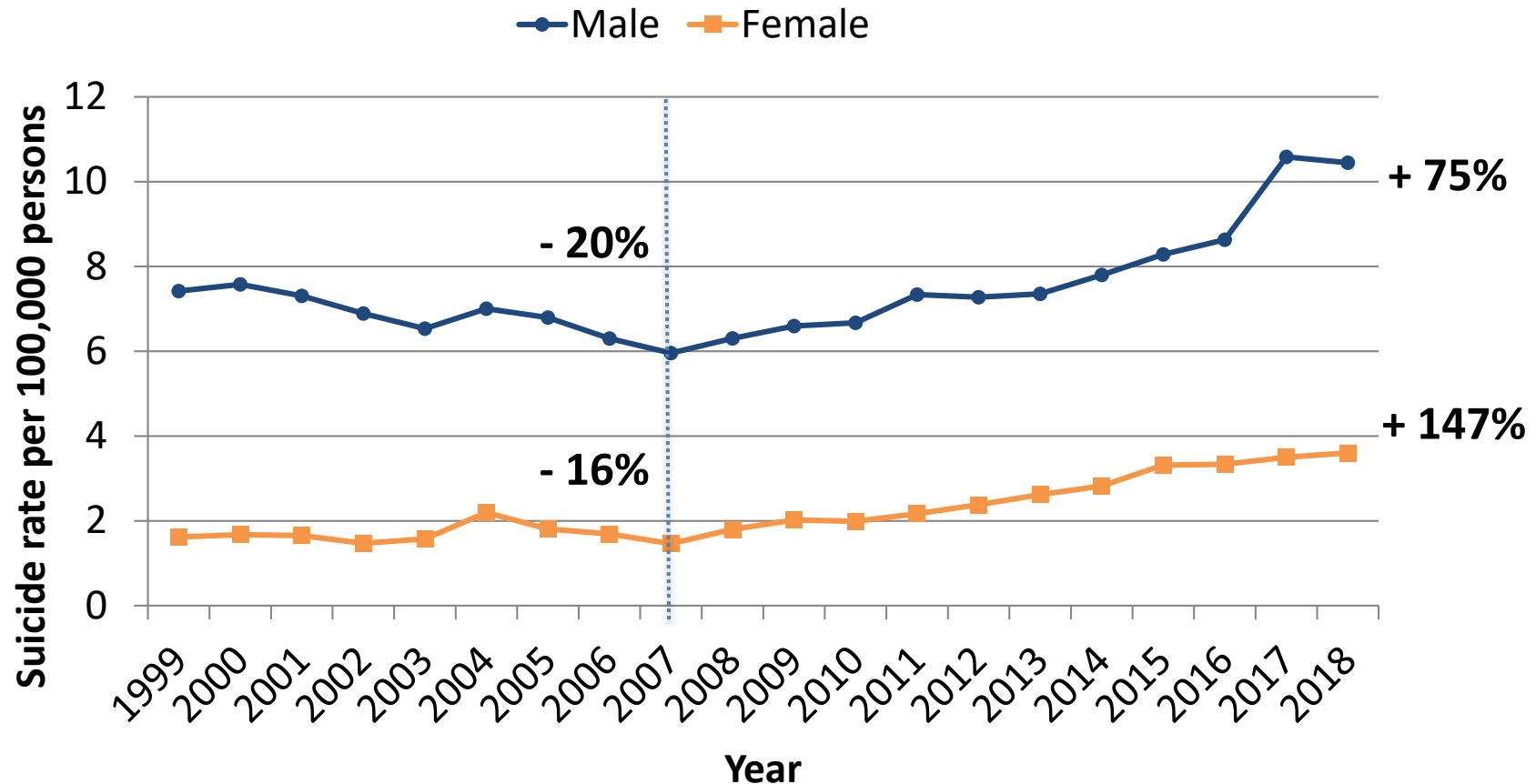
Holly Hedegaard, M.D., Sally C. Curtin, M.A., and Margaret Warner, Ph.D.



# Suicide Rates in US Youth Aged 10-19 Years, 1999 to 2018

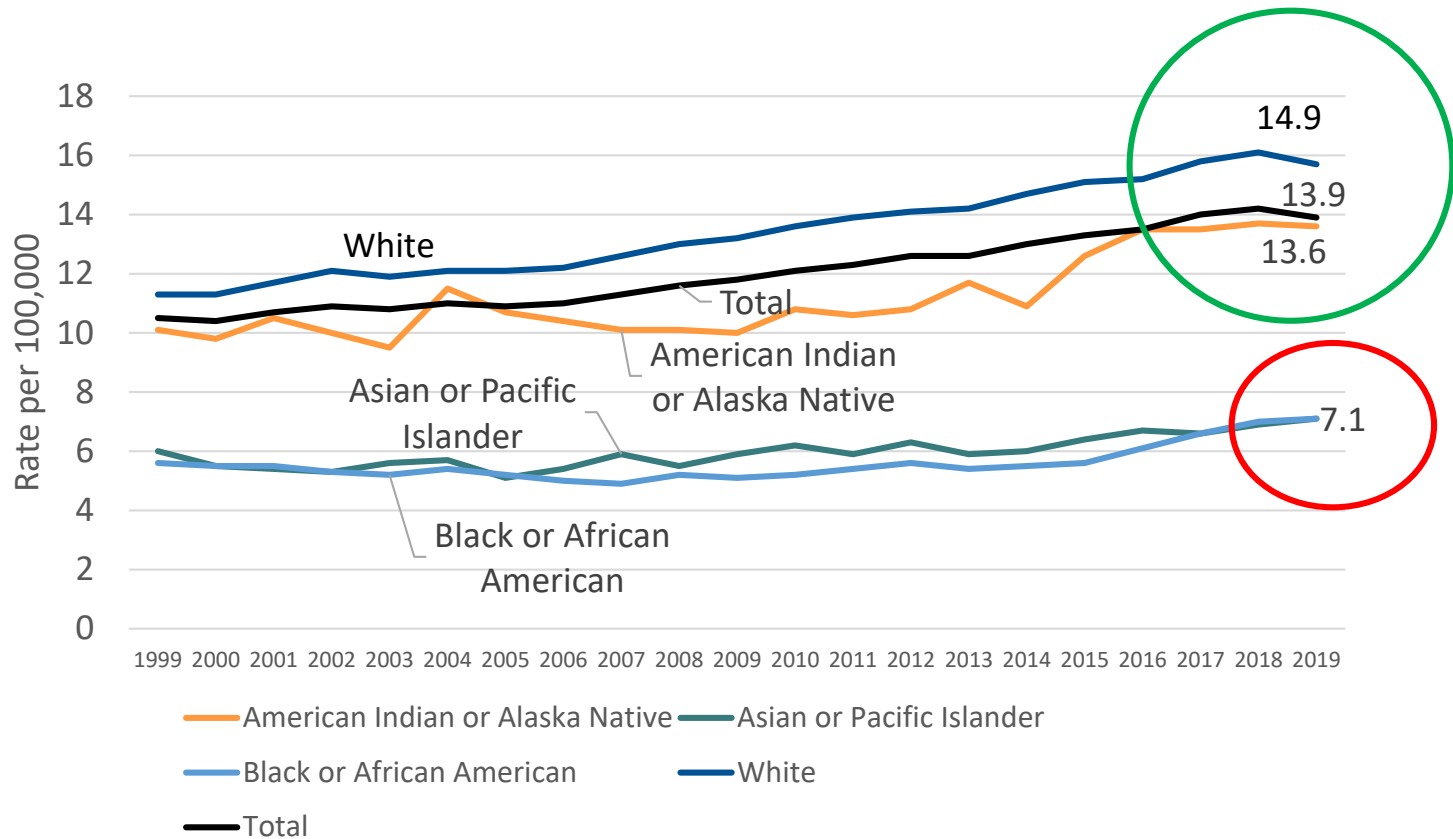


# Youth Suicide Rate in the U.S., 1999-2018, 10-19 Years



Source: CDC WISQARS, 2016,  
[www.cdc.gov/injury/wisqars/index.html](http://www.cdc.gov/injury/wisqars/index.html)

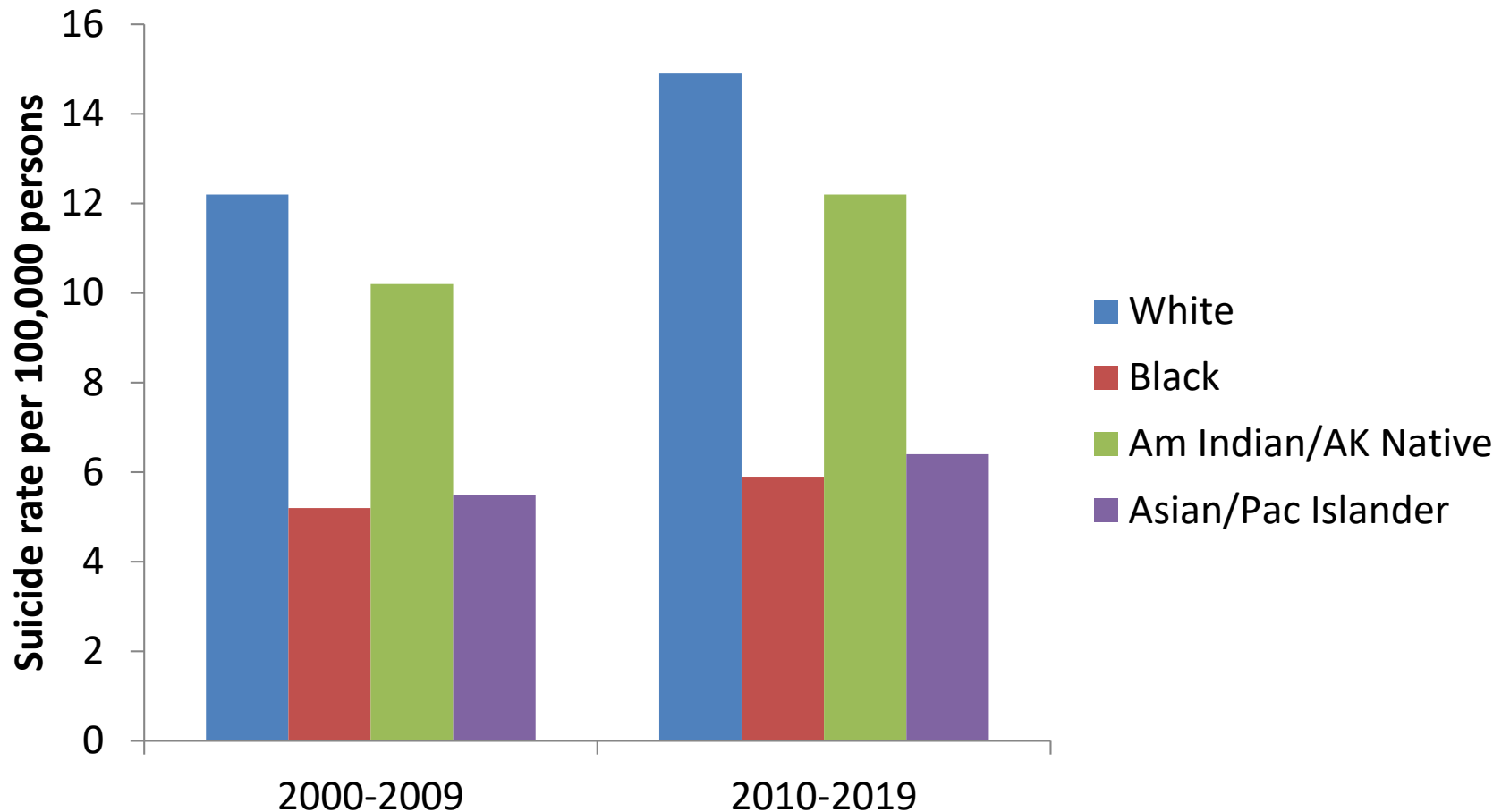
# Age-adjusted Suicide Rates by Race: US 1999-2019



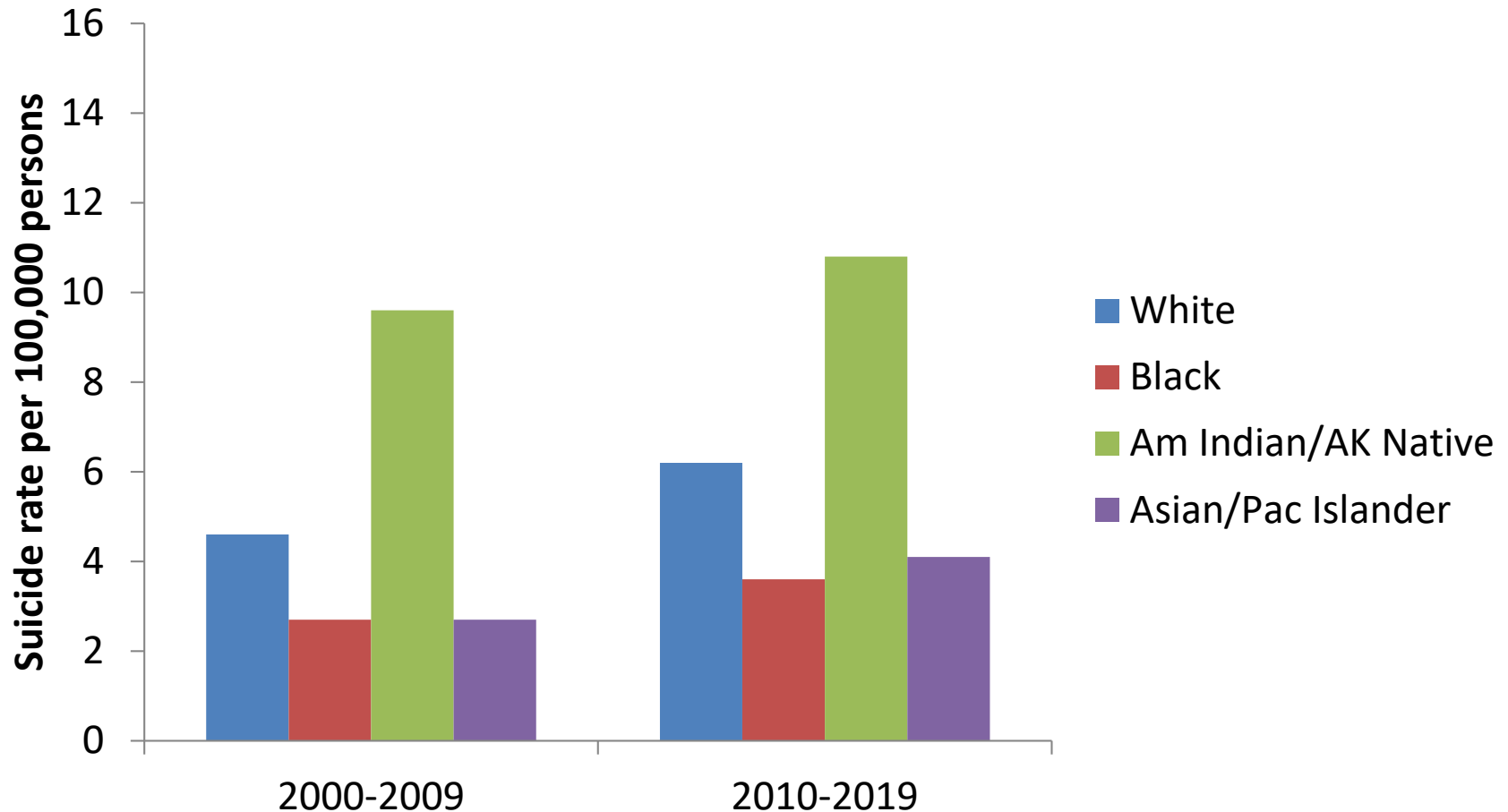
Ramchand: Data from National Vital Statistics System



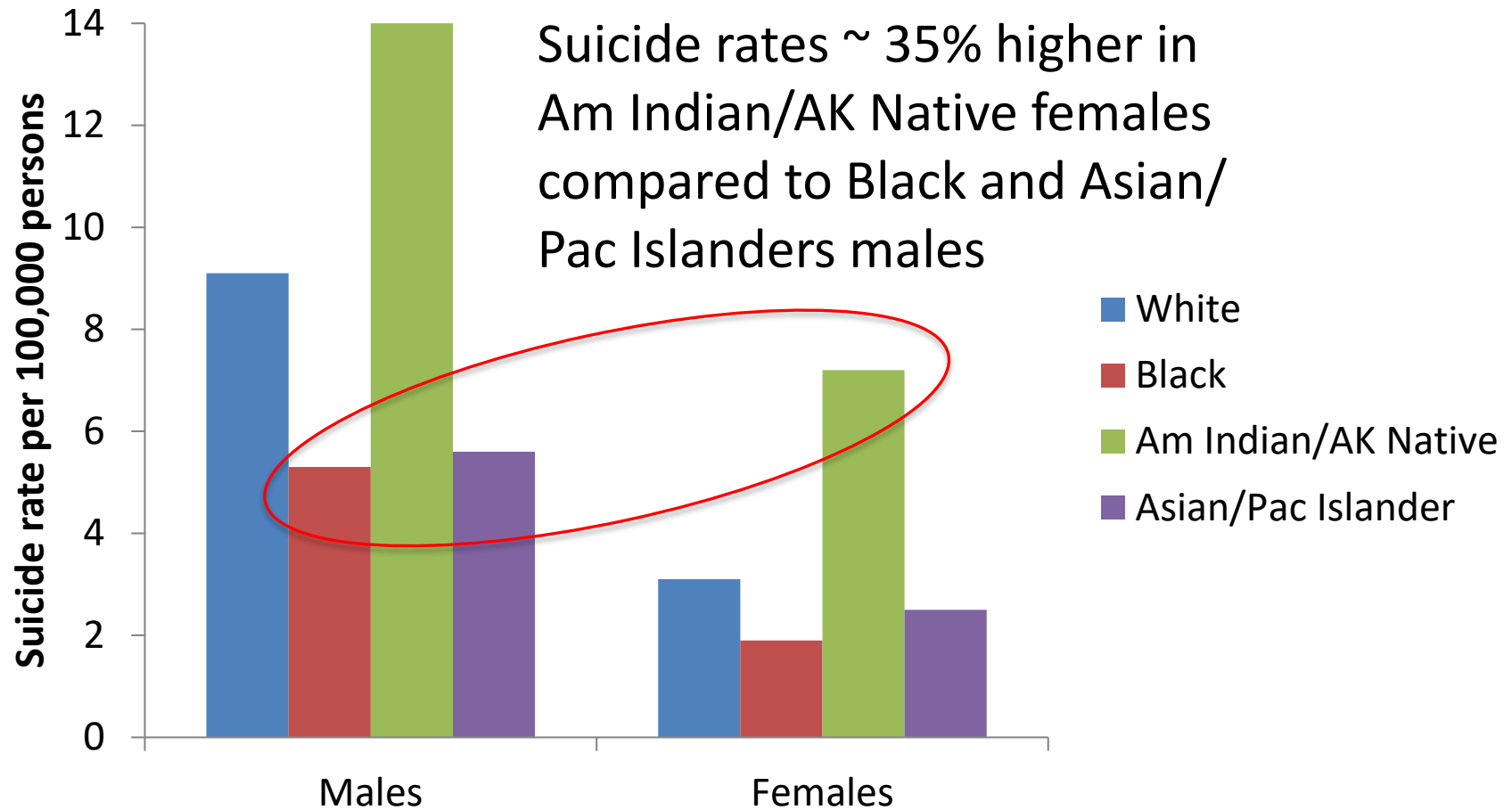
# Suicide Rates in US, All Ages 2000 to 2019, by Race



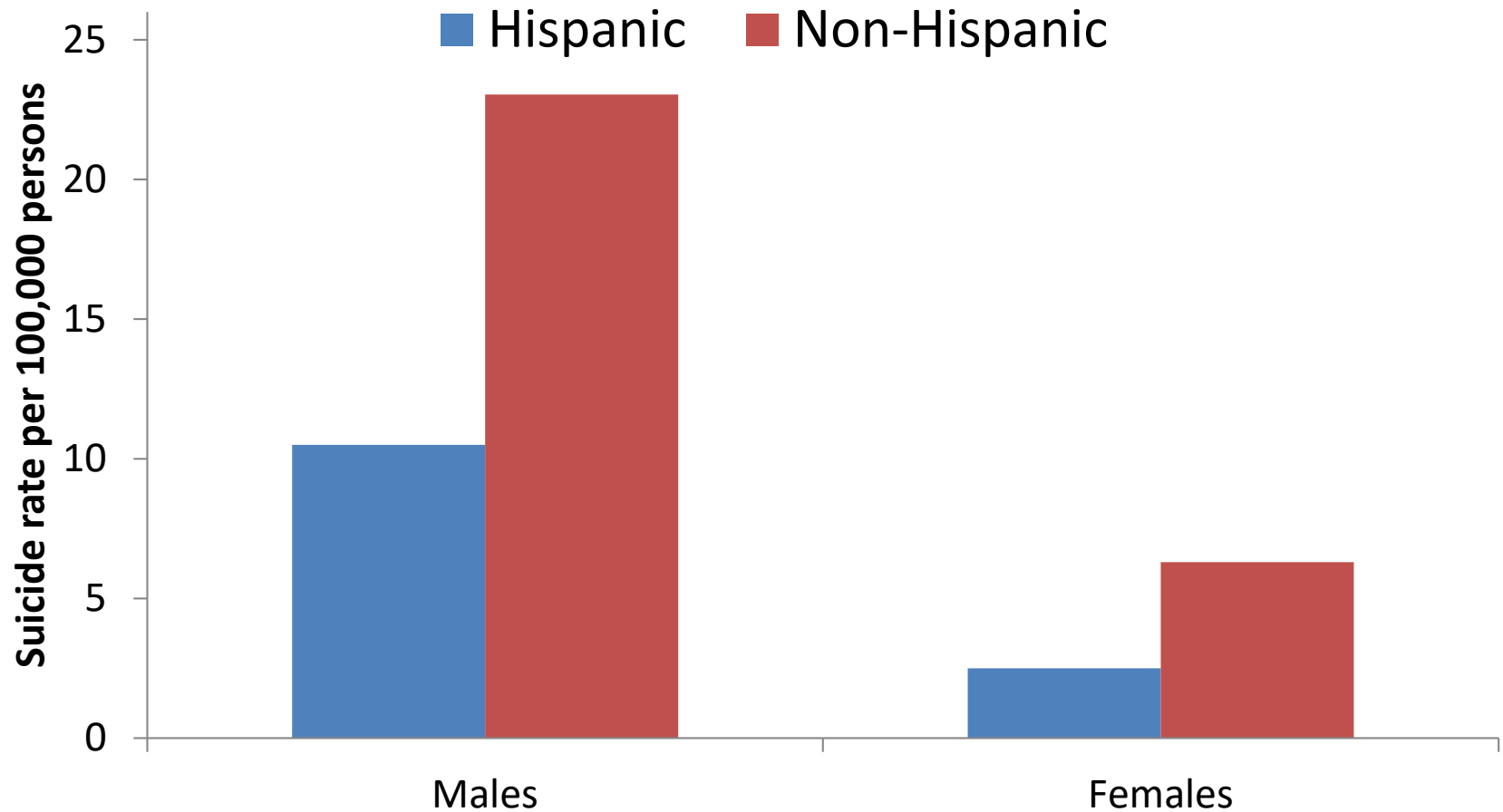
# Suicide Rates in US Youth Aged 10-19 Years, 2000 to 2019, by Race



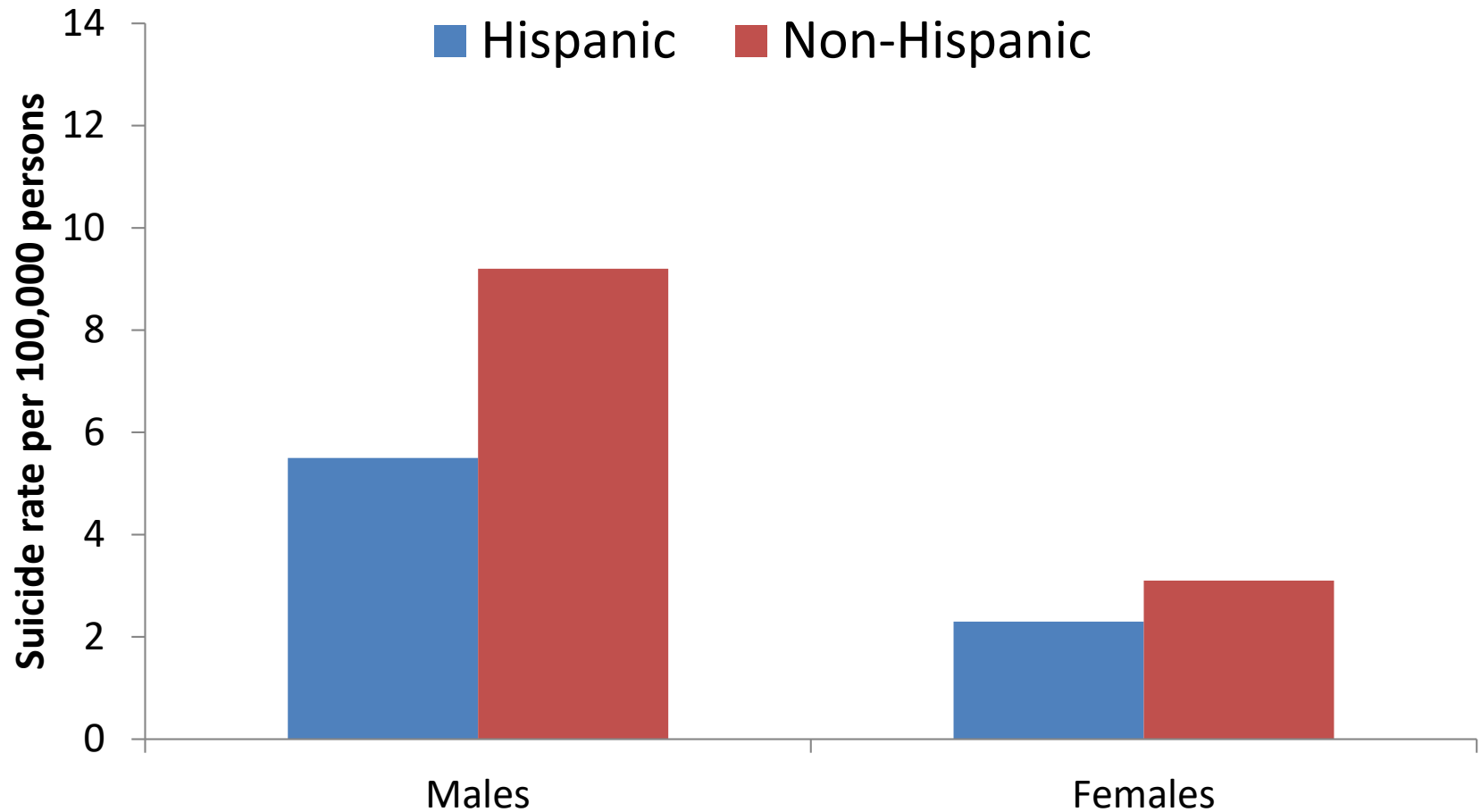
# Suicide Rates in US Youth Aged 10-19 Years, 2010 to 2019, by Race



# Suicide Rates in US, All Ages, 2010 to 2019, by Ethnicity



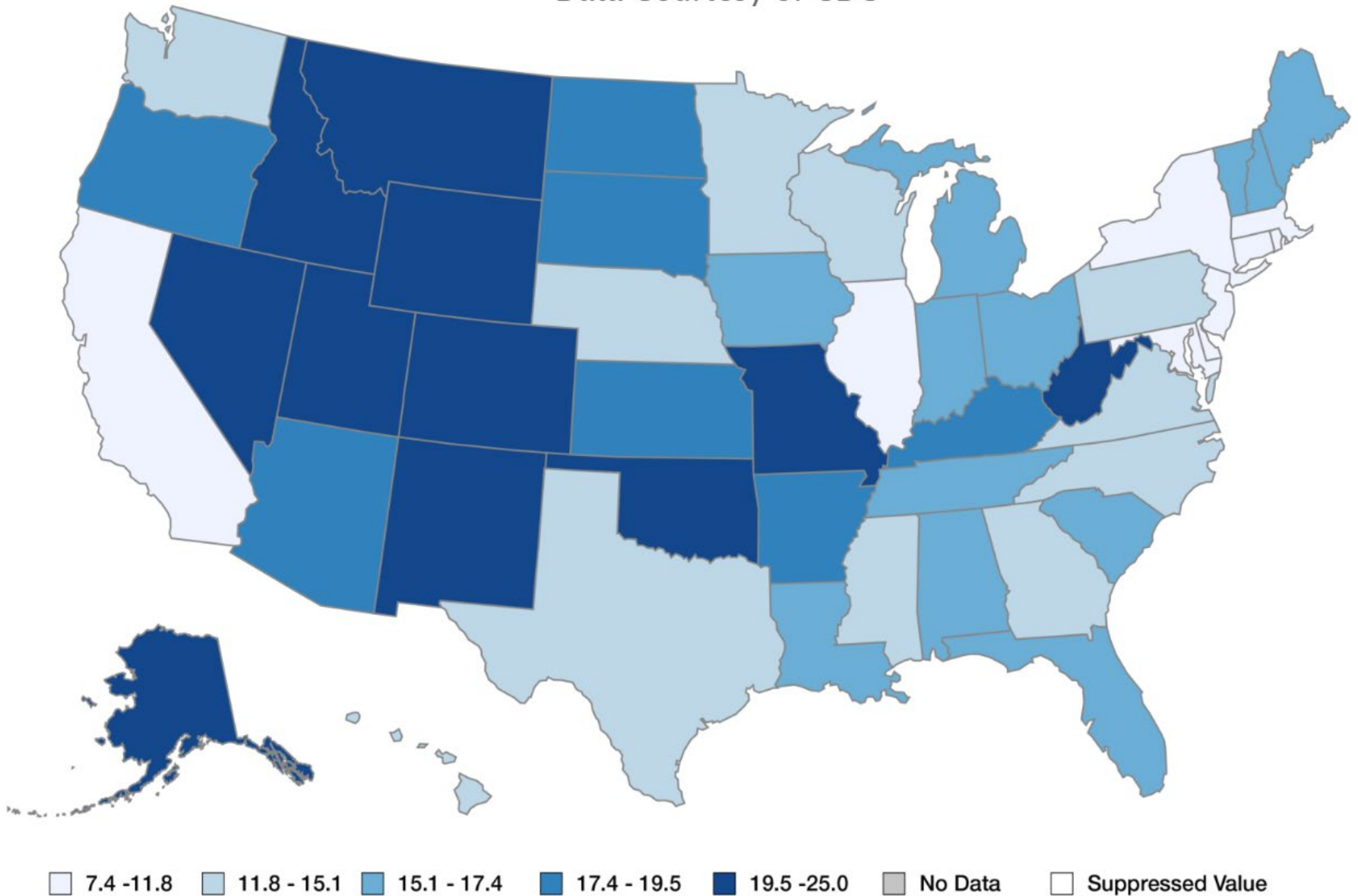
# Suicide Rates in US Youth Aged 10-19 Years, 2010 to 2019, by Ethnicity



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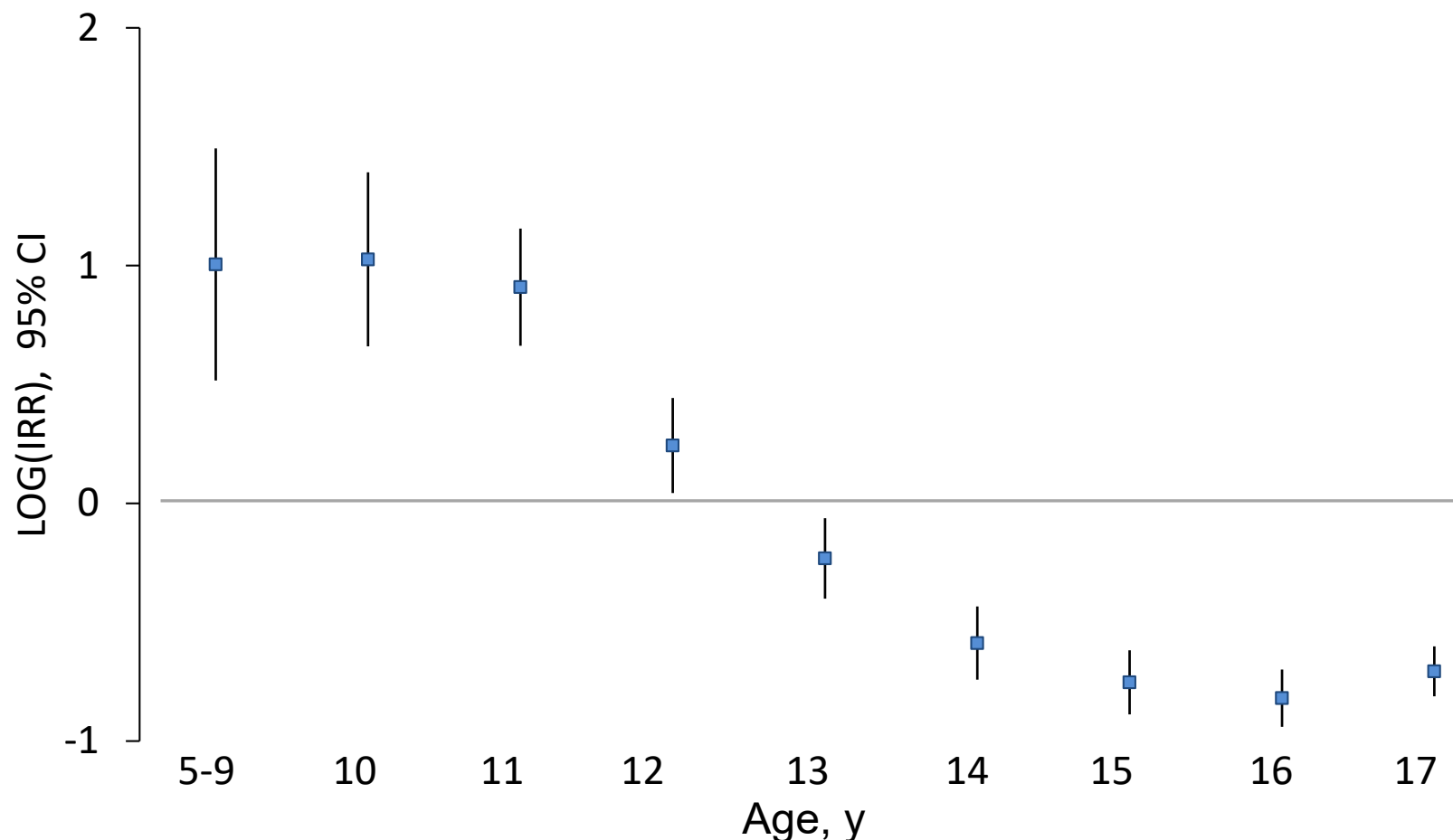
(by state; per 100,000; 2019)

Data Courtesy of CDC



# **Suicide in Black Youth**

# Comparison of Suicide Incidence Rates Between Black and White Youth in the U.S. From 2001 to 2015, by Age



Abbreviations: IRR, incidence rate ratio; LOG, natural logarithm. Blue squares indicate the estimated LOG of the age-specific IRR, vertical lines indicate 95% CI, and reference group is white youth. 95% CIs that do not include zero are considered statistically significant.



# Suicide as Leading Cause of Death, 5-11-Year-Olds, 1999-2018, by Race

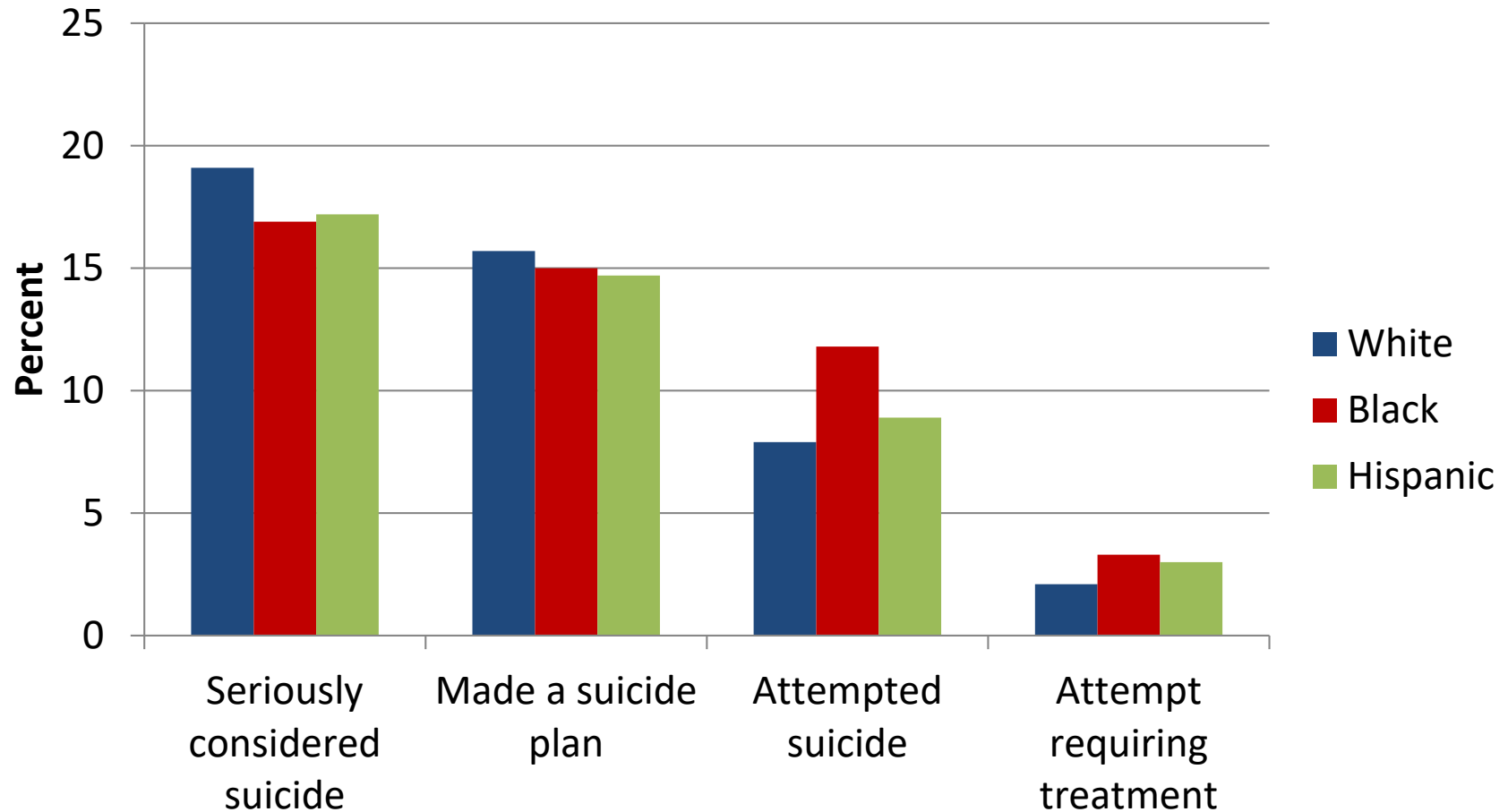
## Black Youth

	1999	2009	2018
1	Unintentional Injury	Unintentional Injury	Unintentional Injury
2	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms
3	Homicide	Congenital Anomalies	Congenital Anomalies
4	Congenital Anomalies	Homicide	Homicide
5	Heart disease	Respiratory Disease	Influenza & Pneumonia
6	Respiratory Disease	Heart Disease	Heart Disease
7	HIV	Influenza & Pneumonia	Suicide (N=25)
8	Anemias	Benign Neoplasms	Influenza & Pneumonia
9	Benign Neoplasms	Septicemia	Cerebrovascular
10	Septicemia	Cerebrovascular	Septicemia
11	Cerebrovascular	Suicide (N=12)	Anemias
12	Influenza & Pneumonia	Anemias	Benign Neoplasms
13	Diseases of Appendix	Diabetes	Perinatal Period
14	Meningitis	Nephritis	Diabetes
15	Nephritis	Perinatal Period	Pneumonitis
16	Suicide (N=4)	Diseases of Appendix	Acute Bronchitis

## White Youth

	1999	2009	2018
1	Unintentional Injury	Unintentional Injury	Unintentional Injury
2	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms
3	Congenital Anomalies	Congenital Anomalies	Congenital Anomalies
4	Homicide	Homicide	Homicide
5	Heart disease	Influenza & Pneumonia	Influenza & Pneumonia
6	Benign neoplasms	Heart Disease	Heart Disease
7	Influenza & Pneumonia	Benign Neoplasms	Suicide (N=47)
8	Septicemia	Cerebrovascular	Cerebrovascular
9	Respiratory Disease	Respiratory Disease	Septicemia
10	Cerebrovascular	Septicemia	Respiratory Disease
11	Perinatal period	Suicide (N=27)	Benign Neoplasms
12	Suicide (N=16)	Anemias	Perinatal Period
13	Nephritis	Diabetes	Diabetes
14	HIV	Perinatal Period	Meningitis
15	Meningitis	Meningitis	Anemias
16	Meningococcal Infection	Diseases of Appendix	Nephritis

# Percentage of U.S. High School Students Reporting Suicidal Thoughts and Behavior in the Past 12 Months, by Race/Ethnicity, 2019

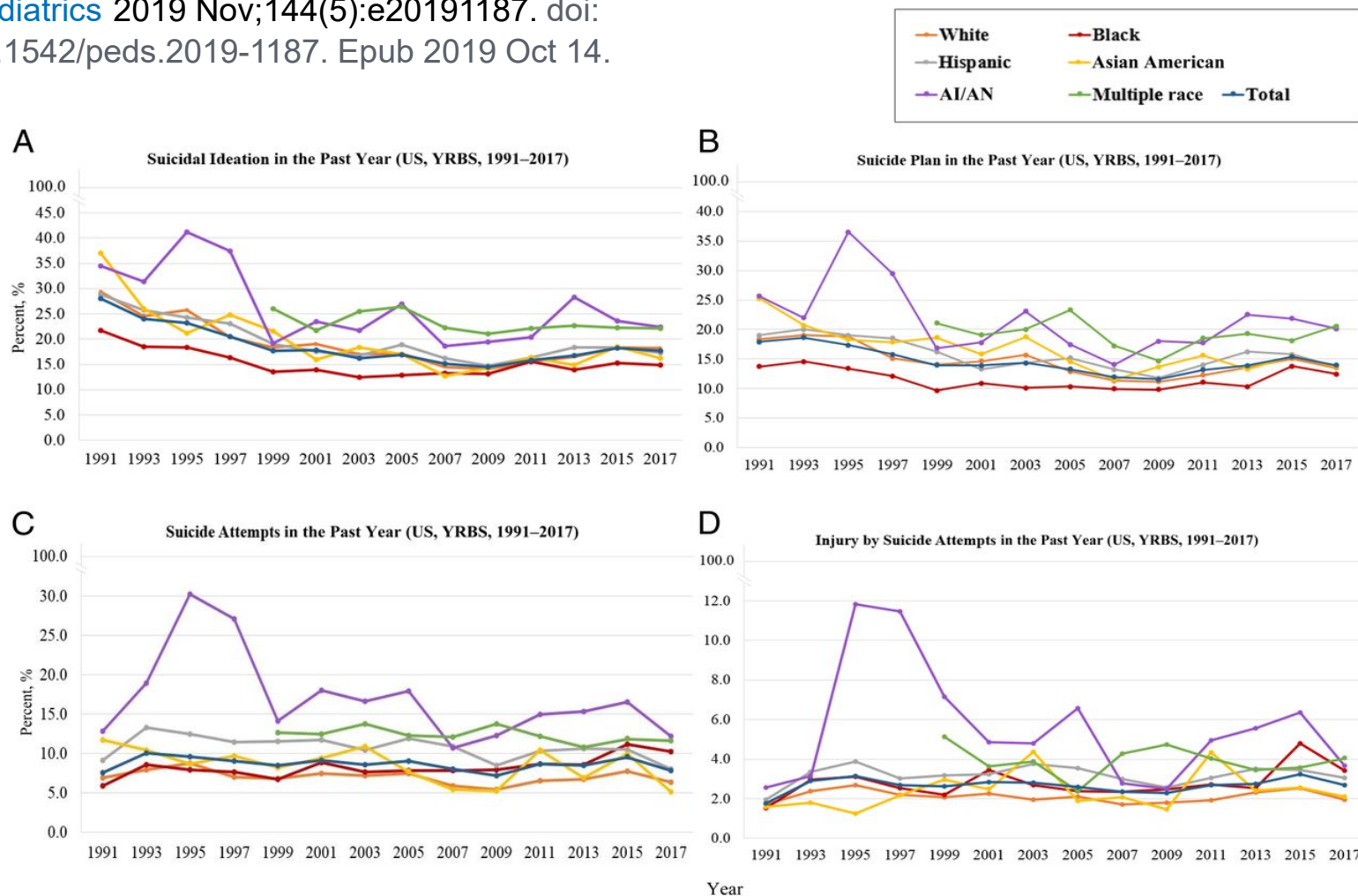


Source: Youth Risk Behavior Surveillance-US, 2019; USDHHS, CDC.

# Trends of Suicidal Behaviors Among High School Students in the United States: 1991-2017

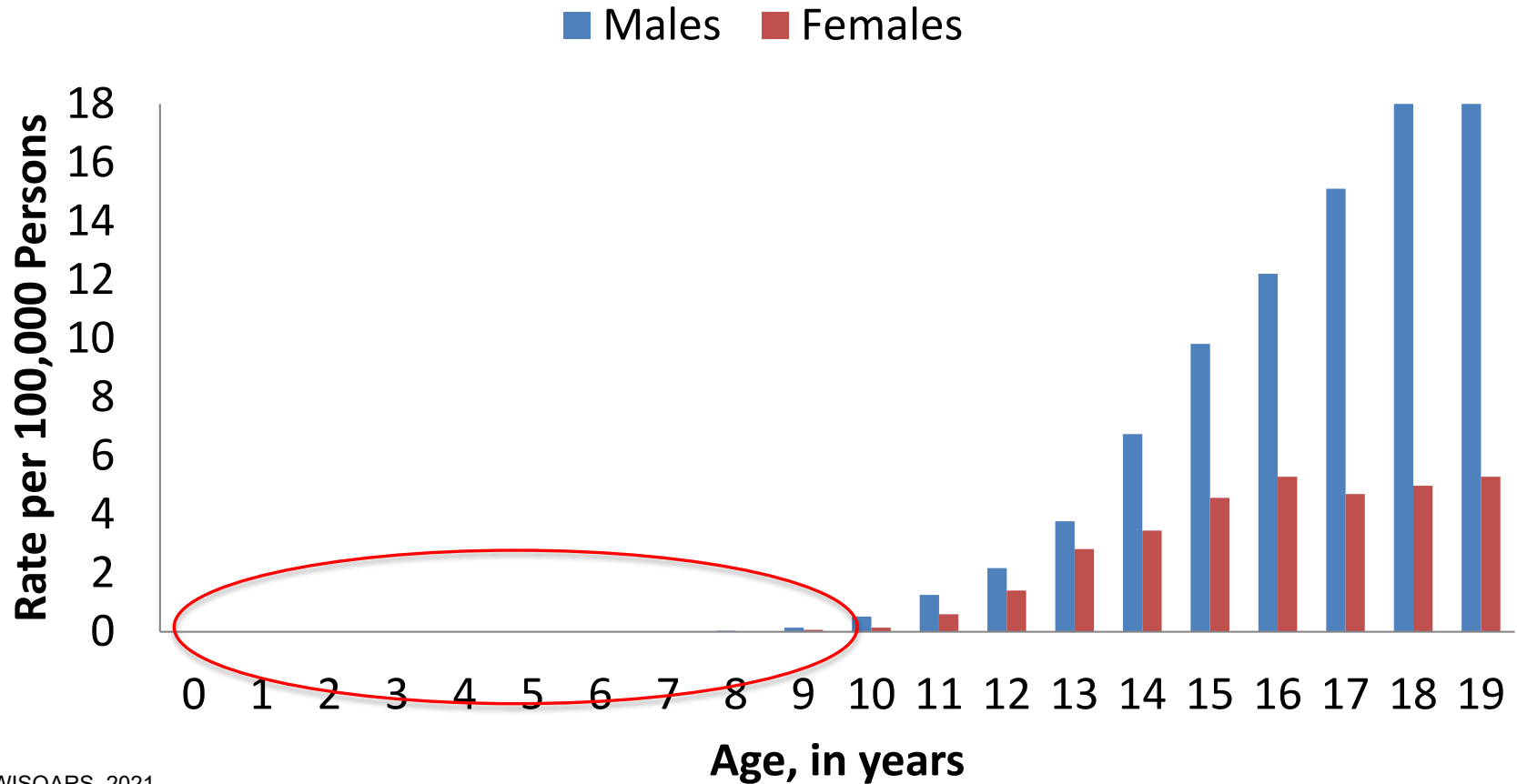
[Michael A Lindsey](#)<sup>1 2</sup>, [Arielle H Sheftall](#)<sup>3 4 5 6</sup>, [Yunyu Xiao](#)<sup>7 2</sup>, [Sean Joe](#)<sup>8</sup>

*Pediatrics* 2019 Nov;144(5):e20191187. doi:  
10.1542/peds.2019-1187. Epub 2019 Oct 14.



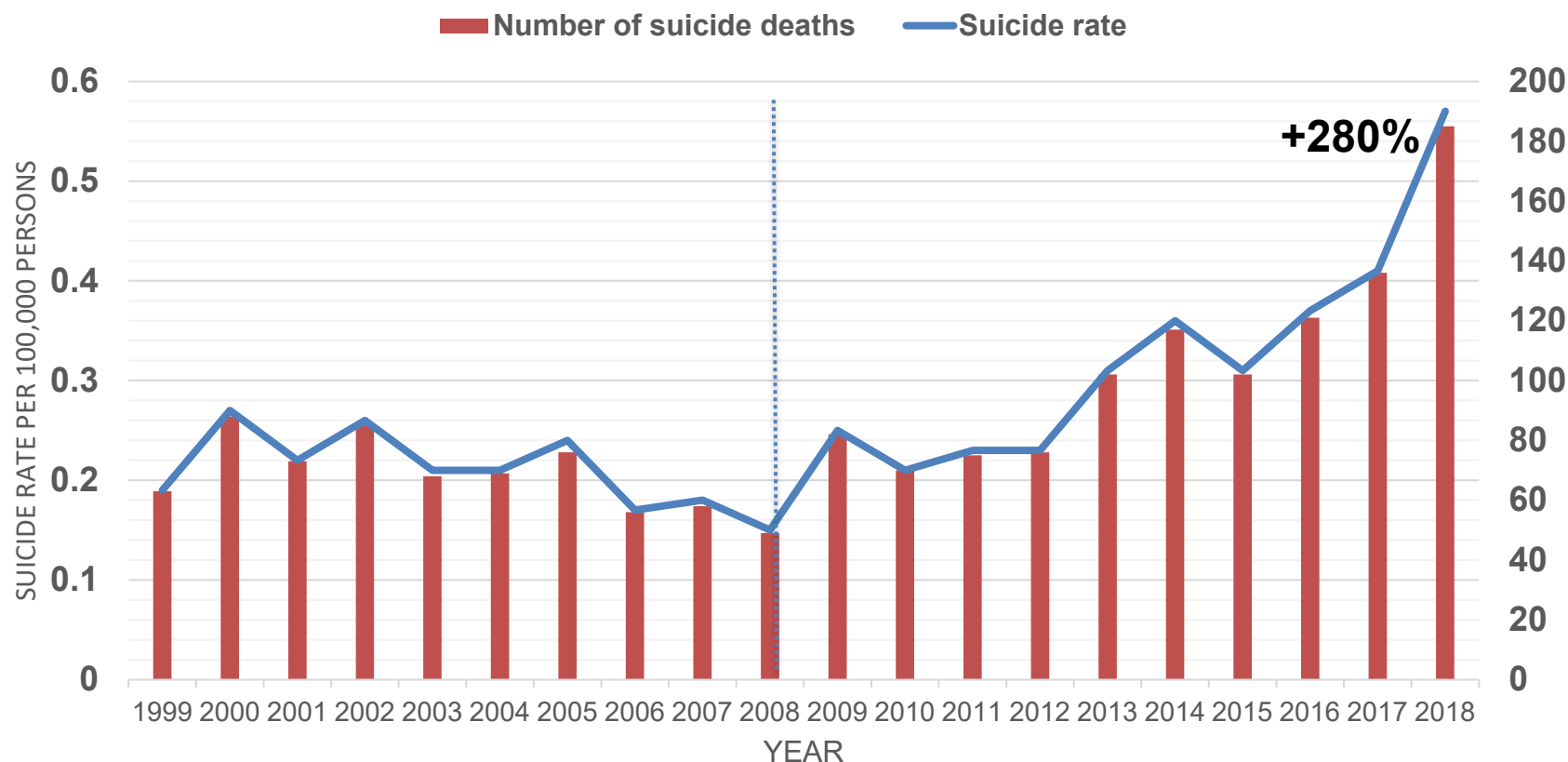
# **Suicide in Pre-Teens**

# Suicide Rates by Age and Sex in US Youths, 2015-2019



\*CDC WISQARS, 2021

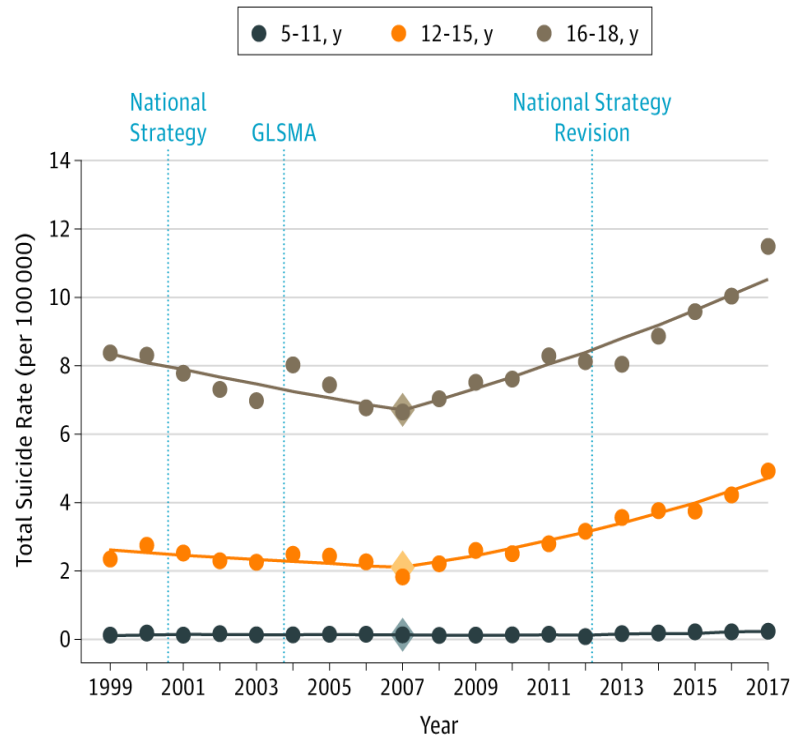
# Suicide Rates in US Youth Aged 5-12 Years, 1999 to 2018



Data from CDC WISQARS

# From: Trends in US Suicide Deaths, 1999 to 2017, in the Context of Suicide Prevention Legislation

JAMA Pediatr. 2020;174(5):499-500. doi:10.1001/jamapediatrics.2019.6066



Age, y	APC (95% CI)	P Value
<b>5-11</b>		
1999-2012	-1.27 (-3.5 to 1.1)	.26
2012-2017	14.69 (3.8 to 26.7)	.01
<b>12-15</b>		
1999-2007	-2.79 (-4.6 to -0.9)	.007
2007-2017	8.47 (7.0 to 9.9)	<.001
<b>16-18</b>		
1999-2007	-2.72 (-4.4 to -1.0)	.004
2007-2017	4.65 (3.4 to 6.0)	<.001

**APC=14.69**

## Figure Legend:

Suicide Rates of Children Ages 5 to 18 Years, Stratified by Age Group, United States, 1999-2017 Figures were prepared with data from the US Centers for Disease Control and Prevention. GLSMA indicates the Garrett Lee Smith Memorial Act.

# 10 Leading Causes of Death, US: Focus on Youth

## Ages 5 – 12 years

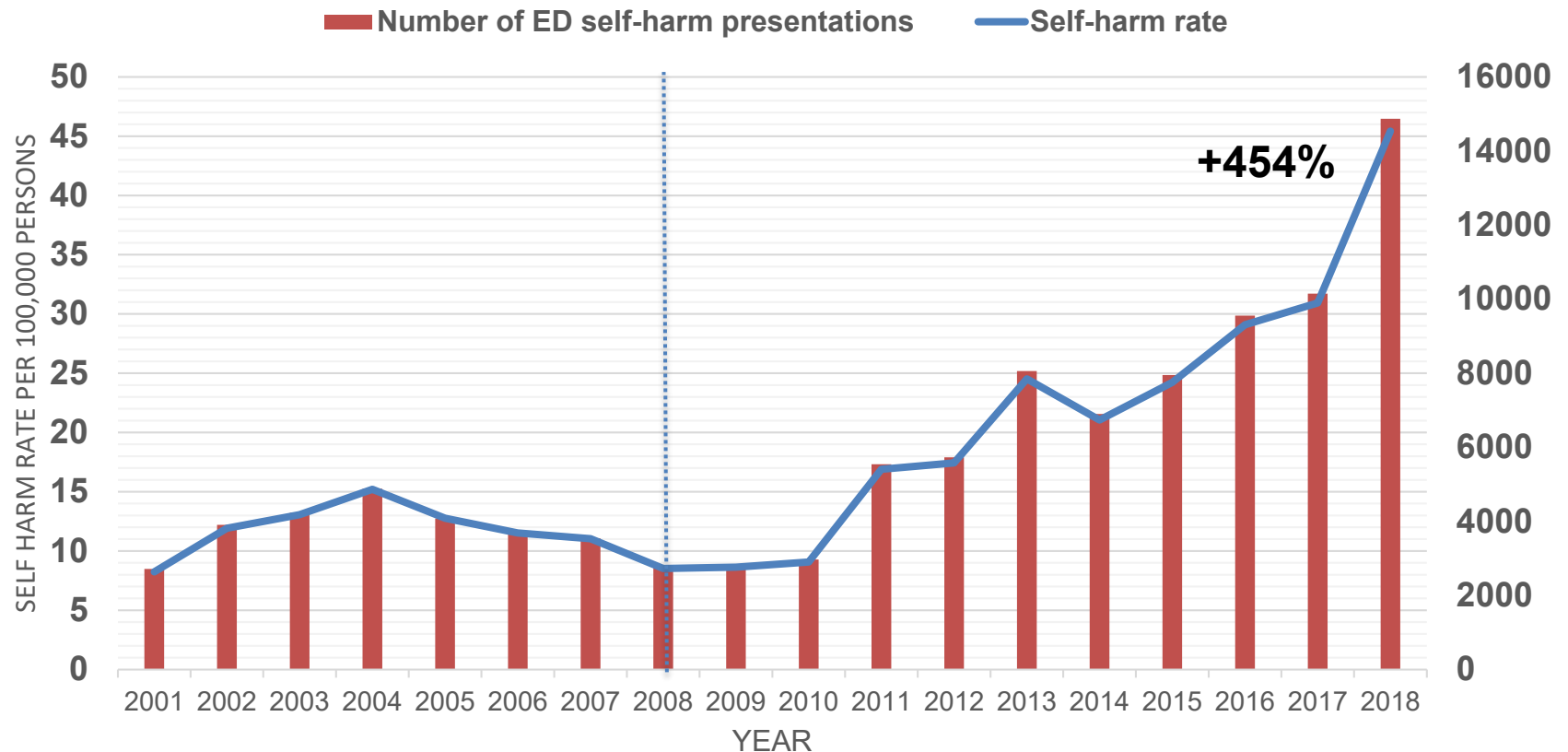
## 13- 17-Year-Olds

	2008	2013	2018
1	Unintentional Injury	Unintentional Injury	Unintentional Injury
2	Malignant Neoplasms	Malignant Neoplasms	Malignant Neoplasms
3	Congenital Anomalies	Congenital Anomalies	Congenital Anomalies
4	Homicide	Homicide	Homicide
5	Heart Disease	Chronic Low Respiratory Disease	<b>Suicide (185 deaths)</b>
6	Chronic Low Respiratory Disease	Heart Disease	Heart Disease
7	Benign Neoplasms	<b>Suicide (102 deaths)</b>	Chronic Low Respiratory Disease
8	Cerebrovascular	Influenza & Pneumonia	Influenza & Pneumonia
9	Influenza & Pneumonia	Cerebrovascular	Cerebrovascular
10	<b>Suicide (49 deaths)</b>	Benign Neoplasms	Septicemia

2018
Unintentional Injury
<b>Suicide (1649 deaths)</b>
Homicide
Malignant Neoplasms
Heart Disease
Congenital Anomalies
Chronic Low Respiratory Disease
Benign Neoplasms
Cerebrovascular
Influenza & Pneumonia



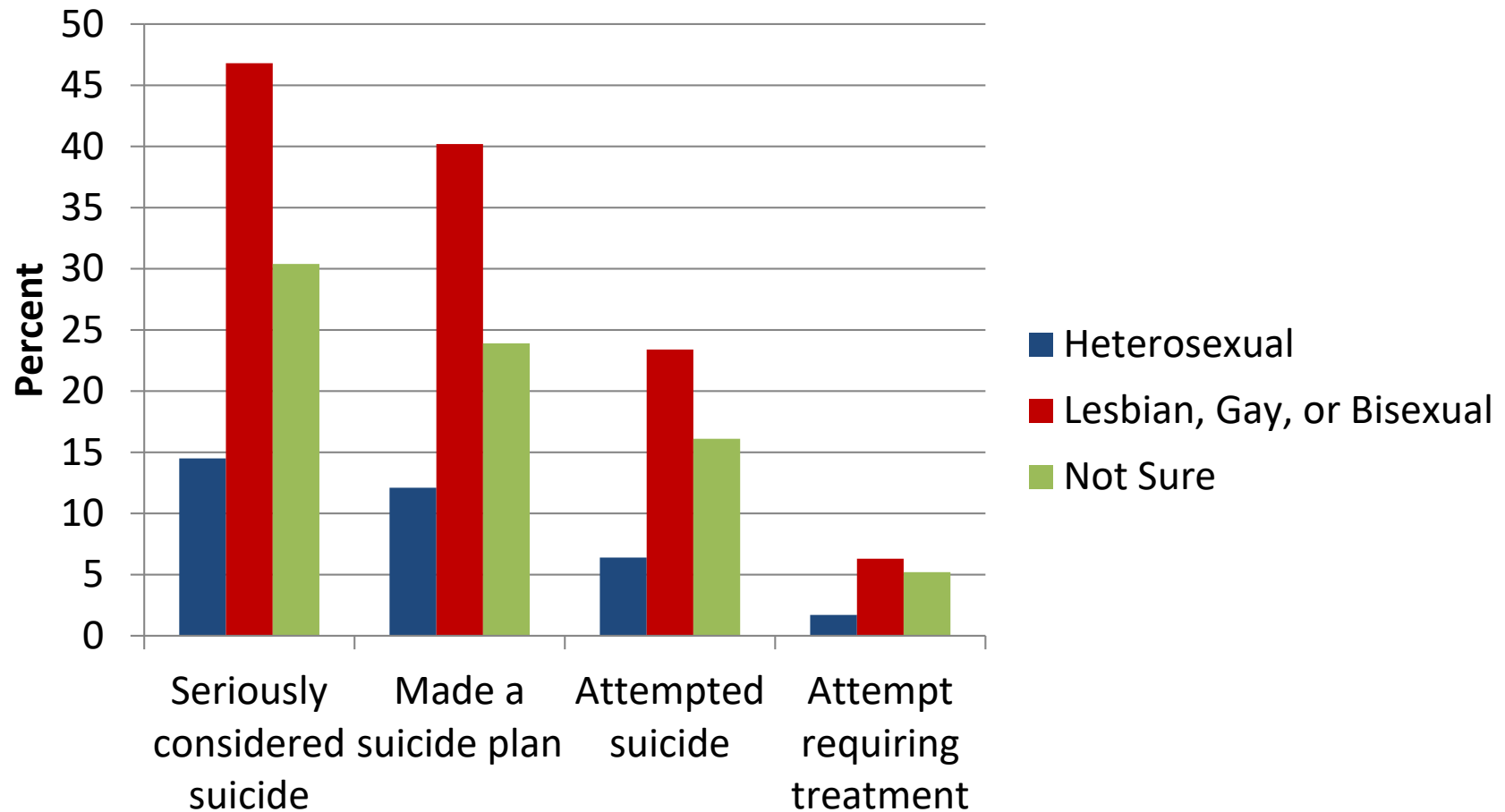
# Self-Harm Rates in US Youth Aged 5-12 Years, 2001 to 2018



Data from CDC WISQARS

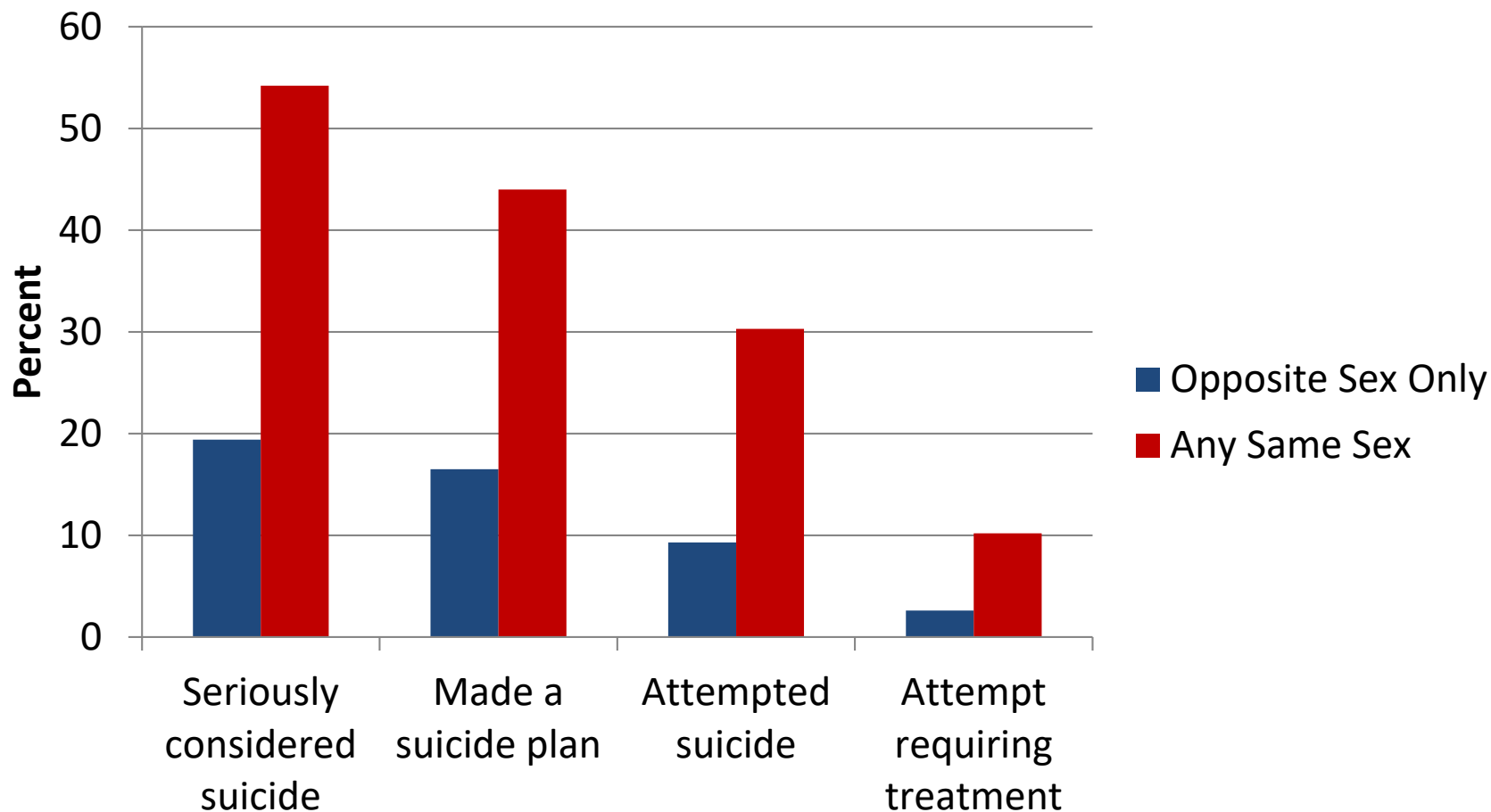
# **Sexual Identity and Suicidal Behavior**

# Percentage of U.S. High School Students Reporting Suicidal Thoughts and Behavior in the Past 12 Months, by Sexual Identity, 2019



Source: Youth Risk Behavior Surveillance-US, 2019; USDHHS, CDC.

# Percentage of U.S. High School Students Reporting Suicidal Thoughts and Behavior in the Past 12 Months, by Sex of Sexual Contacts, 2019



Source: Youth Risk Behavior Surveillance-US, 2019; USDHHS, CDC.



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# **COVID-19 and Suicidal Behavior**

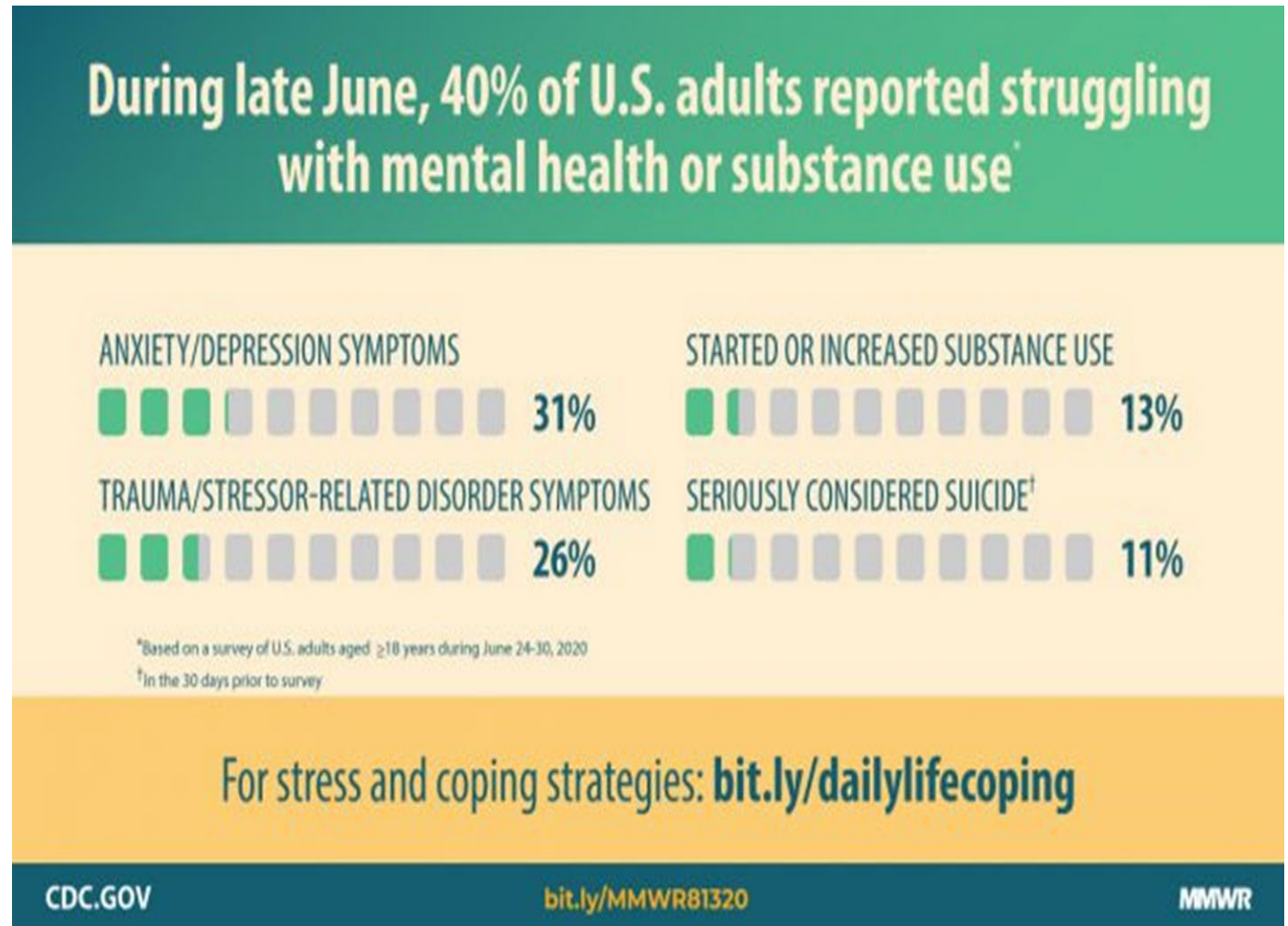
# Maryland Suicide Numbers 2020 vs 3 Years Previous

	2017	2018	2019	2020	% change	p
<b>Jan 1 – Mar 4 (Beginning of year to emergency declaration)</b>						
Total	95	92	84	95	5.2	0.98
Black	16	20	18	14	-22.2	0.70
White	75	65	61	70	6.6	0.78
<b>Mar 5 – May 7 (Emergency declaration to opening of public spaces)</b>						
Total	100	94	92	71	-25.5	.04
Black	8	14	12	22	94.1	.01
White	89	74	72	43	-45.1	<0.001
<b>May 8 – Jul 7 (Opening of public spaces to study end)</b>						
Total	94	119	73	70	-26.6	.04
Black	18	18	17	14	-20.8	.69
White	72	88	46	48	-30.1	.03

Bray MJC, Daneshvari NO, Radhakirshnan I, Cubbage J, Eagle M, Southall P, Nestadt PS. 2020. Racial Differences in Statewide Suicide Mortality Trends in Maryland During the Coronavirus Disease 2019 (COVID-19) Pandemic. JAMA Psychiatry. Published online Dec 16, 2020.

# MMWR: Suicidal Ideation under COVID-19

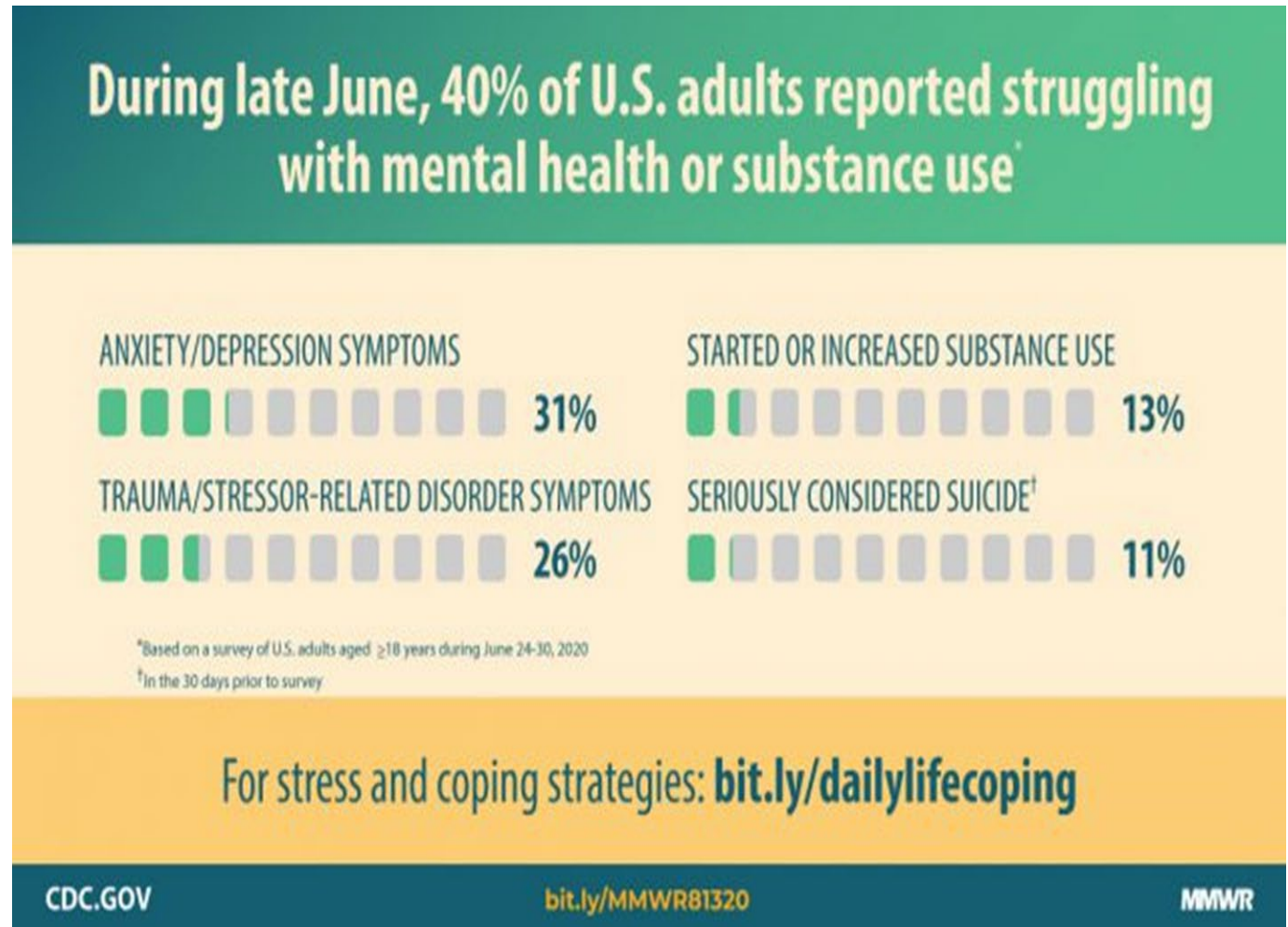
Younger adults, racial/ethnic minorities, essential workers, and unpaid adult caregivers reported having experienced disproportionately worse mental health outcomes, increased substance use, and elevated suicidal ideation.



Czeisler MÉ, Lane RI, Petrosky E, et al. Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic — United States, June 24–30, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1049–1057. DOI: [http://dx.doi.org/10.15585/mmwr.mm6932a1external\\_icon](http://dx.doi.org/10.15585/mmwr.mm6932a1external_icon).

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# **BLM, Racism and Suicidal Behavior**

## RESEARCH ARTICLE

# African American adolescent suicidal ideation and behavior: The role of racism and prevention

W. LaVome Robinson<sup>1</sup> | Christopher R. Whipple<sup>2</sup> | Leonard A. Jason<sup>1</sup> | Caleb E. Flack<sup>1</sup>

JOCPP, DOI: 10.1002/jcop.22543

### Abstract

. . . The Adapted-Coping with Stress Course (A-CWS), an adaptation of Gregory Clarke and colleagues' Coping with Stress Course, was developed to address the cultural nuances of African American adolescents. The A-CWS is a 15-session cognitive-behavioral, group-based preventive intervention that aims to enhance adaptive coping skills and reduce suicidal ideation, by incorporating strategies that counter stressors associated with systemic racism that burden African American adolescents. This study evaluated the feasibility and acceptability of the A-CWS intervention, using a sample of predominantly African American ninth-grade students. Results indicated that the adolescents were very favorable and receptive to the A-CWS intervention and that the intervention could be conducted feasibly. The A-CWS intervention serves as a model to advance culturally-grounded, evidence-based preventive intervention, for an underserved sector of adolescents.

## RESEARCH ARTICLE

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# The American Foundation for Suicide Prevention Launches Project 2025

# The National Action Alliance for Suicide Prevention Adopts the Same Timeline



**A Prioritized Research Agenda for Suicide Prevention:**  
**An Action Plan to Save Lives**  
Research Prioritization Task Force

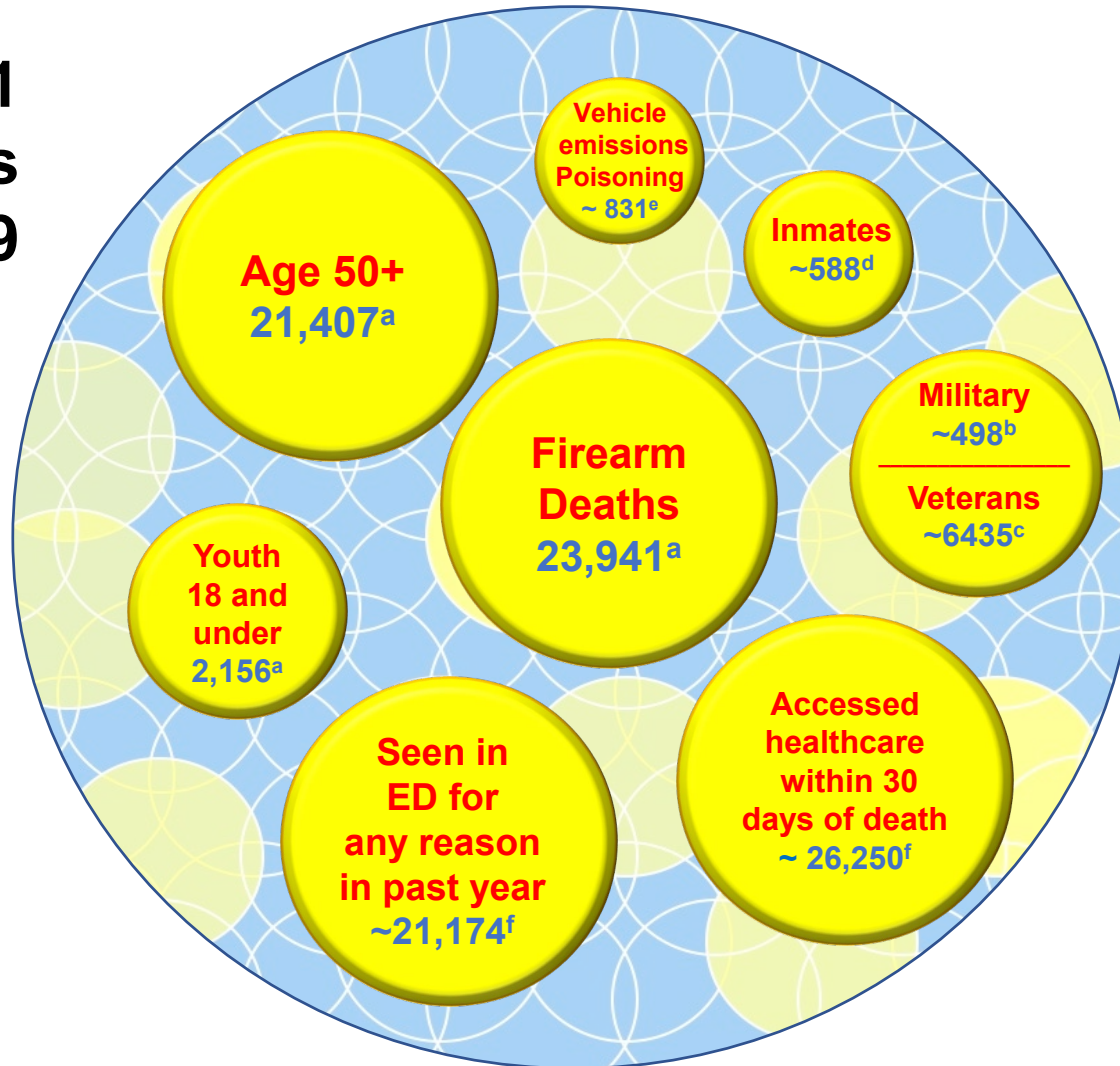
**Action Alliance**  
FOR SUICIDE PREVENTION

The Public-Private Partnership Advancing the National Strategy for Suicide Prevention

Source: <http://afsp.org/american-foundation-suicide-prevention-launches-project-2025/>;  
<http://actionallianceforsuicideprevention.org/about-us>

# Identifying Suicide Decedents in the US

**47,511  
Decedents  
in 2019**



Overlap in subgroups and **multiple opportunities** to detect individuals at risk

# Actionable Research for the 2025 Suicide Reduction Goal

Understand when and where individuals access health care



Identify individuals at risk



Provide effective interventions

Ahmedani, *Preventive Medicine*, 2019

Suicide decedents are accessing healthcare

~30%	Visit within 7 days of suicide
>50%	Visit within 30 days of suicide
>90%	Visit within 365 days of suicide

**EDs** may provide a unique opportunity to prevent suicide

~ 6%	Visit within 7 days of suicide
~20%	Visit with 60 days of suicide
~ 44%	Visit within 365 days of suicide

**Primary care** may provide a unique opportunity to prevent suicide

~ 10%	Visit within 7 days of suicide
~ 39%	Visit with 60 days of suicide
~ 79%	Visit within 365 days of suicide

# Questions?

## **The Center for Suicide Prevention and Research**

<http://www.nationwidechildrens.org/suicide-prevention>

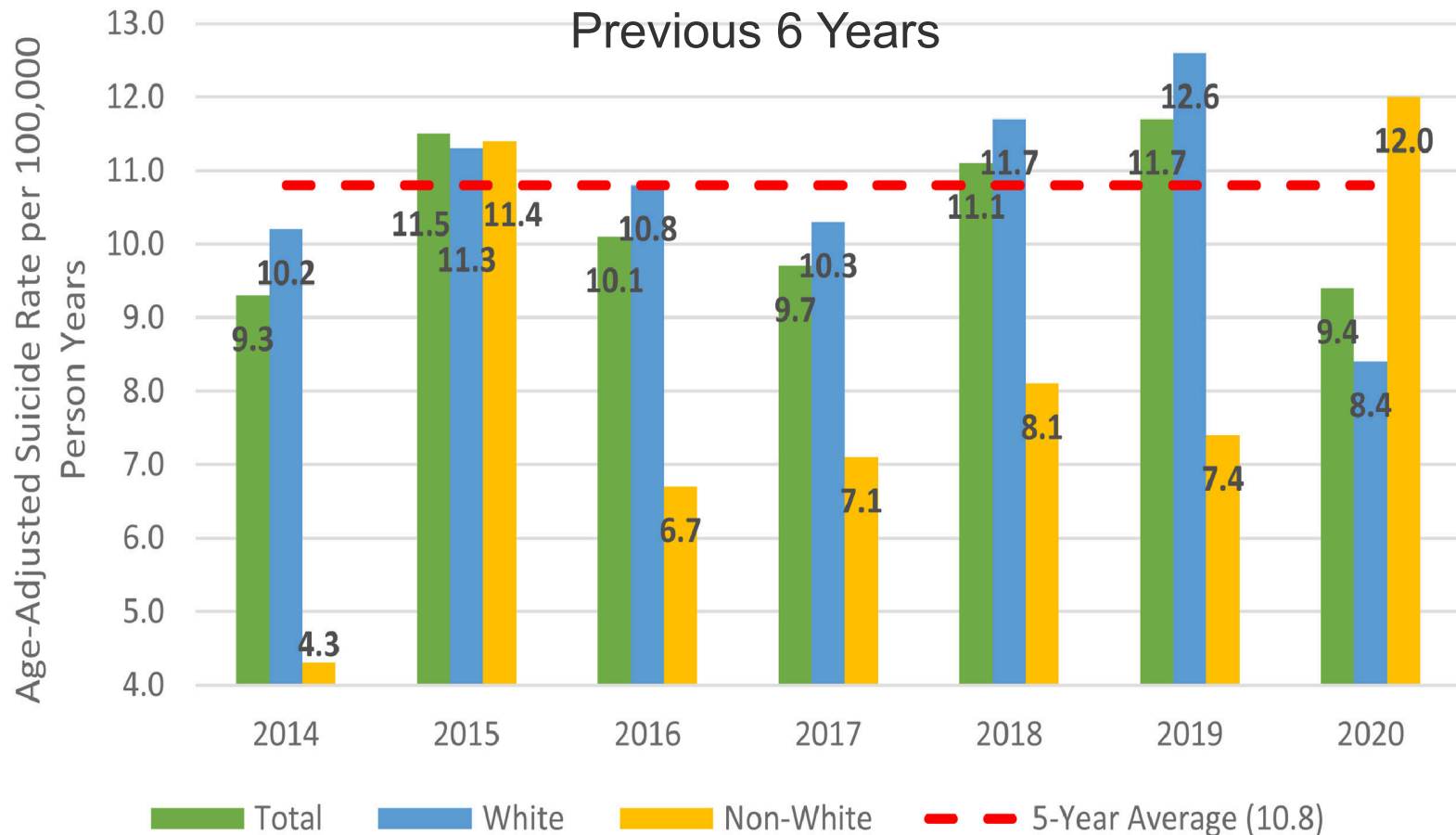
Phone: 614-355-0850

Email: [suicideprevention@nationwidechildrens.org](mailto:suicideprevention@nationwidechildrens.org)



# Connecticut Suicide Rates March to May 2020 vs Previous 6 Years

Age-Adjusted Suicide Rates by Race in Connecticut During COVID-19 Lockdown Period Compared with March 10<sup>th</sup> to May 20<sup>th</sup> in





# HHS 2020. *African American Youth Suicide: Report to Congress*

**Table A-3. Number of Suicides per Year for Children Aged 5 to 17, 1999 to 2018**

Cells with fewer than 20 cases are indicated with yellow shading.

Ages 5 to 9	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
All children	2	7	7	4	6	2	2	3	4	7	6	7	5	5	9	3	4	7	5	9
Black children	0	0	2	1	1	1	1	0	2	2	2	0	3	2	4	2	2	4	3	4
Ages 5 to 11	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
All children	31	45	34	42	30	32	37	26	33	24	34	34	33	30	38	49	46	53	59	84
Black children	4	5	10	8	9	9	12	9	15	9	12	12	8	16	11	15	15	19	16	25
Ages 5 to 12	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
All children	63	88	73	85	68	69	76	56	58	49	82	70	75	76	102	117	102	121	136	185
Black children	13	11	21	14	16	17	22	14	18	19	21	18	19	22	22	28	26	26	29	42

Source: National Vital Statistics System.

Data compiled by NIH/NICHHD

# ABCD Study: Rates of Suicide Ideation and Attempts Among Children Ages 9 & 10



Original Investigation | Psychiatry

## Prevalence and Family-Related Factors Associated With Suicidal Ideation, Suicide Attempts, and Self-injury in Children Aged 9 to 10 Years

Danielle C. DeVille, MA; Diana Whalen, PhD; Florence J. Breslin, MS; Amanda S. Morris, PhD; Sahib S. Khalsa, MD, PhD; Martin P. Paulus, MD; Deanna M. Barch, PhD

Table 2. Prevalence Estimates of Suicidal Ideation, Suicide Attempts, and Nonsuicidal Self-injury

Problem	Unweighted Count, No. (%) <sup>a</sup>	Weighted Population Estimate, No.	Prevalence Estimate, % (95% CI) <sup>b</sup>
Ideation			
Passive	763 (6.46)	526 098	6.44 (5.71-7.26)
Active			
Nonspecific	512 (4.32)	358 693	4.39 (3.85-5.00)
Specific	266 (2.25)	194 983	2.39 (2.13-2.68)
Suicide attempt	127 (1.08)	102 896	1.26 (1.01-1.57)
Nonsuicidal self-injury	1068 (9.04)	746 612	9.14 (8.13-10.3)

**YRBS  
2017**

17.2

13.6

7.4