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Changing Trends in Suicide Mortality and Firearm Involvement Among Black Young Adults, 1999–2019

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Abstract

The suicide rate among adolescents and young adults in the United States increased 57% between 2007 and 2018, from 6.8 to 10.7 deaths per 100 000 individuals. Recent research characterized as alarming the increases in overall suicide rates among young Black and other racial/ethnic minority populations. To assess the temporal trends in overall suicide and firearm suicide mortality rates among non-Hispanic Black young adults, we conducted a sex-specific Joinpoint regression analysis to identify changing trends in these rates between 1999 and 2019. Data were obtained from the Centers for Disease Control and Prevention's Web-based Injury Statistics Query and Reporting System. Results showed an 84.5% increase in the firearm suicide rate among young Black men and a 76.9% increase among young Black women between 2013 and 2019. Additional research is needed to investigate potential population-level exposures during or before 2013 that may have influenced suicide and firearm suicide risk.

Keywords

Suicide; firearm; gender; temporal trends; Black young adults

INTRODUCTION

The suicide rate among adolescents and young adults in the United States increased 57% between 2007 and 2018, from 6.8 to 10.7 deaths per 100 000 individuals (Curtin, 2020). Recent research characterized as alarming the increases in overall suicide rates among

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AUTHOR NOTES

MSK conceptualized and designed the study, contributed to the analysis, and drafted the initial manuscript. RSB and AMW contributed to the design and performed the analysis. All the authors discussed the results, contributed to the writing, and approved the final manuscript as submitted.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

young Black and other racial/ethnic minority populations (Ramchand, Gordon, & Pearson, 2021). This work and government reports (e.g., the Surgeon General's recent Public Health Advisory on youth mental health [2021] and the Congressional Black Caucus' Emergency Report on Black Youth Suicide [2021]) have resulted in extensive media coverage of fatal or near-fatal suicide attempts in young people of color (Caron, 2021).

The young adulthood years (ages 18 to 25) represent a crucial period in the lifespan, characterized by an increase in excess mortality partially attributed to suicide (Remund, Camarda, & Riffe, 2018), the second leading cause of death for this age group in the United States (CDC, 2005) and the fourth leading cause globally among 15–29 year olds (World Health Organization, 2021). Young adults may be influenced by distinctive social, psychological, and biological factors contributing to an increased vulnerability to adverse mental health outcomes (Arnett & Mitra, 2020; Schwartz & Petrova, 2019).

Firearms are the most common and lethal method of suicide across groups in the United States (Wintemute, 2015); suicide accounts for approximately 60% of all firearm deaths, compared to 27% of firearm deaths globally (Naghavi et al., 2018). In the American context, gun violence contributes to enduring Black-White mortality disparities, and rates of firearm suicide across the lifespan are highest during young adulthood for Blacks, especially among men (CDC, 2005; Wintemute, 2016). Thus, understanding the role of firearms in increasing trends of suicide is critical. Preventing firearm suicides also requires evidence-based policy and public health strategies (Mann & Michel, 2016). To inform such prevention efforts specifically among Black individuals, we assessed temporal trends in overall suicide and firearm suicide mortality rates among non-Hispanic Black young adults.

METHODS

Using mortality data from the Centers for Disease Control and Prevention's Web-based Injury Statistics Query and Reporting System (WISQARS) from 1999 through 2019, we identified numbers of adults aged 18 to 25 years who died of suicide (any method: ICD-10 codes X60-X84, Y87.0, or U03) and, specifically, firearm-related suicide (ICD-10 codes X72-X74) in the United States. Sex-specific age-adjusted mortality rates per 100 000 population for non-Hispanic Blacks were analyzed using Joinpoint software 4.9.0.0 (NCI, 2021) to test temporal trends in suicide and firearm suicide rates. Joinpoint regression is a data-driven technique that tests whether a graphically-apparent change in a trend line is statistically significant. The technique fits the simplest model that the data allow; for the present analysis, a maximum of 3 possible joinpoints were specified, as is standard for joinpoint analyses involving 17–21 data points (NCI, 2021). Statistical significance was defined using a 2-sided $P < .05$. We report annual percentage change (APC) estimates and 95% CIs based on identified joinpoint years.

RESULTS

Among Black young adults in the United States between 1999 and 2019, there were 8,945 suicides among men, of which 5,424 (60.2%) were firearm suicides. Among women, 1,580 suicides occurred, with 507 (31.6%) using firearms. The crude overall suicide and firearm

suicide rates per 100,000 were 16.26 and 9.78 for men and 2.88 and 0.91 for women. Overall and firearm suicide mortality trends changed significantly after 2013 except for overall suicides among women (Figure 1).

Among men, the overall suicide rate per 100,000 decreased from 18.8 in 1999 to 14.1 in 2013 (APC, −1.6%; 95% CI, −2.4% to −0.8%), followed by an increase to 22.5 in 2019 (APC, 8.1%; 95% CI, 5.4% to 11%) (Table 1).

Among women, the overall suicide mortality rate increased linearly over the study period (APC, 4.4%; 95% CI, 3.2% to 5.6%). Trends in suicides involving firearms were similar to those for overall suicide among men. Firearm suicide rates per 100 000 decreased from 13.4 (men) and 1.3 (women) in 1999 to the nadir of 7.0 (men) and 0.7 (women) in 2013, then increased to 12.9 (men) and 1.2 (women) in 2019. Among men, the APCs showed significant change for both time periods 1999 to 2013 (APC, −3.5%; 95% CI, −4.5% to −2.6%) and 2013 to 2019 (APC: 9.8%; 95% CI, 6.2% to 13.5%). For women, only the increase from 2013 to 2019 was significant (APC: 11.8%; 95% CI, 0.9% to 24%). Notably, this translated to an 84.5% increase in the firearm suicide rate among men and a 76.9% increase among women between 2013 and 2019.

DISCUSSION

This temporal analysis of suicide and suicide involving firearms among Black young adults showed declining rates from 1999 to 2013 and a sharp reversal of those downward trends for both sexes after 2013. The mechanisms/causes of this concerning trend are not clear. Evidence shows that firearm sales increased beginning after 2012 (FBI, 2021). Other work suggests that disproportional exposure to gun violence and socioeconomic disadvantage among Black youth may be associated with increased vulnerability to adverse mental health outcomes, suicide, and suicide involving firearms (Kubrin & Wadsworth, 2009). Survey data (Romanelli et al., 2021) indicate that Black youth are more likely than other racial/ethnic minority youths to attempt suicide without typical suicide precursors (such as suicidal ideation), suggesting that suicide attempts in this group may be more impulsive. This context highlights how the intersection of age, gender, and race influences suicide trends.

Equally important, research has highlighted the rising rate of suicide attempts among Black adolescents (Ivey-Stephenson et al., 2019), which may be a harbinger of rising suicide and firearm suicide mortality rates among Black young adults in the near future. Although previous work has focused on suicide risk among young adults, few studies have explicitly focused on the Black population (Ramchand, Gordon, & Pearson, 2021; Mann & Michel, 2016; Kubrin & Wadsworth, 2009). Additional research is needed to investigate potential population-level environmental exposures during or before 2013 that may have influenced suicide and firearm suicide risk in this population, particularly among young Black men. Population-wide policy interventions, especially those that address exposure to firearms, could significantly mitigate the rising trend in suicide rates (Kaplan & Mueller-Williams, 2019; Ishimo et al., 2021). One salient example is Australia’s experiences after the 1996 National Firearms Agreement, which significantly decreased the population’s access to firearms, but spurred a debate regarding the subsequent impact on firearm suicide rates

(Linden & Yarnold, 2018; Leigh & Neill, 2010). Future research should consider how structural factors may lead to suicide and the appropriate analytic methods needed to draw rigorous inferences from these complex relationships. Specific areas of interest include how the intersection of the recent proliferation of firearms (FBI, 2021) and rising racial and economic inequities affect suicide risk among Black young adults.

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DATA AVAILABILITY STATEMENT

Data are available in a publicly, open access repository.

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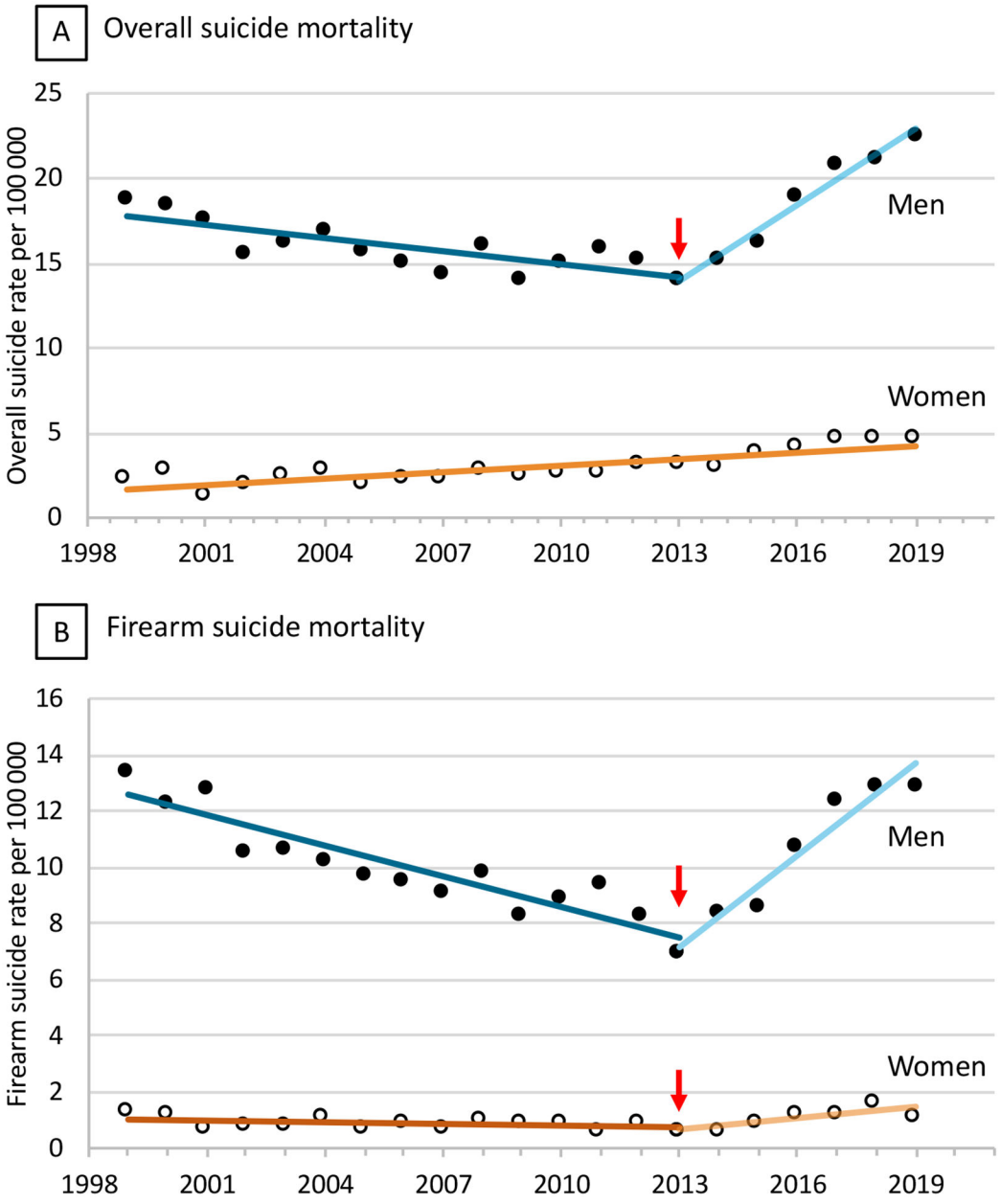

Figure 1.

Trends in Suicide Mortality Among Non-Hispanic Black Young Adults, 1999–2019

Joinpoints identified by red arrows indicate a significant change in trend. For each line with a joinpoint year, darker shades represent the period 1999 to 2013 and lighter shades represent the period 2013 to 2019.

Table 1.

Annual Percentage Change in Suicide Mortality Rates Among Subgroups of Non-Hispanic Black Young Adults, 1999–2019

	Annual percentage change 1999 to 2013 (95% CI)	*P* value	Annual percentage change 2013 to 2019 (95% CI)	*P* value
Overall suicide				
Men	−1.6 (−2.4 to −0.8)	.001	8.1 (5.4–11)	<.001
Women[a]	--	--	--	--
Firearm suicide				
Men	−3.5 (−4.5 to −2.6)	<.001	9.8 (6.2–13.5)	<.001
Women	−2.2 (−5.1 to 0.8)	>.05	11.8 (0.9–24)	<.05

[a]The overall suicide rate increased linearly from 1999 to 2019 for women with an annual average percentage change of 4.4% (95% CI, 3.2% - 5.6%; $P < .001$).