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Trends in Suicide among Black Women in the US, 1999-2020

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Abstract

Objective: Recent increases in suicide deaths among Black women in the US warrant further investigation. Our objective was to clarify the epidemiology of suicide among Black girls and women, by estimating age-period-cohort effects on suicide rates among decedents coded as female aged 15-84 years.

Methods: The present study examined annual time-series data from the National Center for Health Statistics' Multiple Cause of Death 1999-2020 database. Suicide rates by age, period, and cohort were visualized using hexagonal maps, and estimated using modified Poisson regression to address identifiability.

Results: In total, our analysis included 9,271 suicide deaths. Results indicated the presence of all three effects: (i) a clear age effect, with higher rates at younger ages, regardless of cohort and time, (ii) a period effect, with rates generally increasing across time for most ages, and (iii) a cohort effect, with a clustering of increased suicide rates among the youngest cohorts. Across regions, rates were highest among the youngest age groups, concentrated in the West.

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Conclusion: Suicide is increasing rapidly among Black females – with particularly concerning trends among the youngest Black females born in the most recent birth cohorts. Findings suggest a need for increased mental health access and geographically targeted prevention efforts.

Introduction

Suicide is a leading cause of death in the United States (US) (1). Increases in suicide in the US over the last two decades have disproportionately affected Black young women (2, 3). Moreover, while the overall US suicide rate decreased between 2018 and 2020 (4), the suicide rate increased among Black female youth aged 15-24 years from 2.7 to 4.3 per 100,000 between 2013-2019 (5), and accumulating research indicates that younger compared to older generations of Black individuals are increasingly at risk of suicide (6).

Recent increases in suicide deaths among Black young women in the US warrant study of the drivers of risk unique to this population (6). Indeed, racial/ethnic discrimination has recently emerged as a possible driver of suicide risk among younger Black women (7). Assessing age, period, and cohort (APC) effects can provide additional key information about the concentration of suicide risk for specific birth cohorts, across recent time periods, and at specific ages, allowing for a more precise identification of populations in which interventions are particularly urgent. Further, little is known concerning geographical variations in recent suicide trends among Black women in the US. Interrogating geographical variations in suicide is also important for identifying risk factors and potential targeted interventions (8).

Clarifying the epidemiology of suicide among Black girls and women is an unmet public health challenge. Here, we address this gap by estimating age-period-cohort effects of suicide rates among Black women aged 15-84 years in the US between 1999-2020 and assessing trends by census region.

Methods

Data were drawn from the National Center for Health Statistics' Multiple Cause of Death 1999-2020 database (3) and included year of death, race, sex, age, and US census region. We extracted suicide deaths (ICD-10 codes X60-X84 and Y87.0) among individuals classified as Black or African American (inclusive of those classified as Hispanic or Latino/a/x/e and multiracial individuals) and female aged 15-84. We excluded decedents aged <15 and >84 as suicide death counts were too low for reliable analysis. In total, our analysis included 9,271 suicide deaths, ranging from 289 (1999) to 652 (2020). For each birth cohort, and census region, we estimated the rate of recorded suicide deaths per 100,000 Black females based on US Census Bureau population sizes. Age was organized into 10-year groups. Death counts under 20 were not reported.

Suicide rates by age, period, and cohort were visualized using hexagonal maps (9), and estimated using modified Poisson regression to address identifiability. Hexagonal maps overcome limitations of conventional presentations of age, period, and cohort rates and showcase data points for specific ages at specific years for specific cohorts (cohort-period-age), using equally spaced hexagonal grids to facilitate intuitive visual interpretation. All

age, period, cohort isolines were spaced at 2 years. We used methods proposed by Clayton and Schifflers (10, 11) to overcome overidentification problems due to linear dependance (as cohort = period-age) (12). Models were estimated using the "apc.fit" function from the R "Epi" package (13). The iterative model building process began with estimation of a categorical age predictor, followed by a "drift" parameter which constitutes the sum of the linear effects over time of period and cohort effects. Next, first and second derivatives of the drift term were estimated and regressed on period and cohort. First derivatives estimated the increase or decrease in relative suicide risk for each period and cohort. Model fit was assessed at each stage, including age + drift compared to age alone, then iteratively adding in cohort and period effects to ascertain whether model fit improved with additional parameters. Finally, model fit was assessed as each parameter was iteratively removed. We selected 2010 as the reference period as it was an inflection point for subsequent increases in suicide deaths; we chose 1960 as the reference cohort as it was the median across all observed cohorts.

All analyses were conducted using R software, version 4.2 (14).

Results

Suicide rates among Black females aged 15 to 84 increased from 2.1 per 100,000 in 1999 to 3.4 per 100,000 in 2020. Rate increases were concentrated among those aged 15-24, increasing from 1.9 to 4.9 per 100,000.

Figure 1 provides a visualization of APC effects in suicide among Black females aged 15 to 84 in the US from 1999 to 2020. Results indicate the presence of all three effects: (i) a clear age effect, with higher rates at younger ages and lower rates at older ages, regardless of cohort and time, (ii) a period effect, with rates generally increasing across time for most ages, but limited evidence of a period effect at older ages, and (iii) a cohort effect, with suicide rates highest among females born after 2002 and a clustering of increased suicide rates among the youngest cohorts.

Model-estimated APC effects of suicide rates are shown in SF1 with the left axis indicating age effects. Across time periods and birth cohorts, suicide rates rapidly increased during adolescence, continued to increase in middle adulthood, and then declined. The right axis shows the risk ratios comparing each cohort and period to the referents, 1960 and 2010 respectively. Decreases in suicide mortality among earlier birth cohorts (1915-1975) and periods (before 2010) predated monotonic increases among subsequent cohorts and periods. In summary, period effects demonstrated that suicide rates increased after 2010, and cohort effects indicated that suicide rates increased faster among the youngest cohorts. ST1 in the Supplement provides model fit results, demonstrating that the inclusion of age, period, and cohort parameters improved model fit.

Figure 2 shows suicide rates by age group and census region. Across regions, rates were highest among those 15-24 and 25-34 years. Although population sizes were lower, rates were highest in the West, peaking at 4.8 per 100,000 among individuals 25-34 years, and deaths were concentrated in the South (ST2 in the Supplement). For example, among

females 15-24, the absolute number of deaths in the South (907) was almost three times higher than the absolute number of deaths in the West (311). State divisions into census regions are shown in ST3 in the Supplement.

Discussion

The findings indicate strong APC effects with suicide increasing rapidly among Black females and particularly concerning trends among individuals born in the most recent birth cohorts. In addition, state and regional variation demonstrate that the highest suicide rates were concentrated in the West, with the most deaths occurring in the South (due to higher Black population counts in the South).

Our findings are in line with evidence that suicidal behaviors are increasing among minoritized youth (15). Importantly, interventions targeting certain stressors may be particularly salient for young Black females, with evidence indicating that cyberbullying and online racial attacks towards Black female youth are on the rise (16). Access to help during suicidal crises is a critical component of suicide prevention efforts (17); however, structural racism – the ways in which values are assigned, maintained or codified in law based on racialized group membership (18) – can reduce access to care of Black youth due to experiences of stigma and mistrust of support systems. For example, this may hinder use of police-led crisis intervention teams in the context of heightened awareness regarding police brutality towards Black individuals. Findings also highlight high rates among those aged 25-27 years, suggesting that this age may be a developmental period for Black women with particular need of additional support. Women in their late 20s may be entering early adulthood in full time work, thus introduced to workplace discrimination (19) or receiving maternal health stressors (20) via entering parenthood and enduring childbirth during which Black women have increased morbidity and mortality (21). Given these patterns, additional research on early adulthood stressors among Black women is warranted. Furthermore, intimate partner violence, neighborhood violence, and poverty also contribute to poor mental health outcomes and limited treatment access and are overrepresented risk factors among Black girls and women in some areas (22, 23). Factors such as feelings of worthlessness and diminished verbal affirmations from parents may also increase suicide risk among Black adolescent girls (24) and are important foci for further research. Reducing barriers in access to care via implementation of community-based, culturally competent care programs is an urgent public health need (25).

To our knowledge, this is the first study to examine the epidemiology of suicide among Black females in the US by geographical region. Limitations include potential administrative misclassification of suicide mortality (26). Furthermore, death certificates only include data on sex assigned at birth, and do not include information on prior suicide attempts, psychiatric disorder history, or mental health service use; more in-depth psychological and social autopsy studies of suicide deaths in the US with such information would add considerable value to research in this field. Future research should consider state level trends and analyses among various ethnicities and gender identities.

Conclusion

This study identifies increasing trends in suicide death among the youngest Black females born in recent years and underscores the need to increase mental health care access among Black girls and women and reduce other forms of structural racism. In addition, regional variation indicates a need for geographically targeted prevention efforts.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments:

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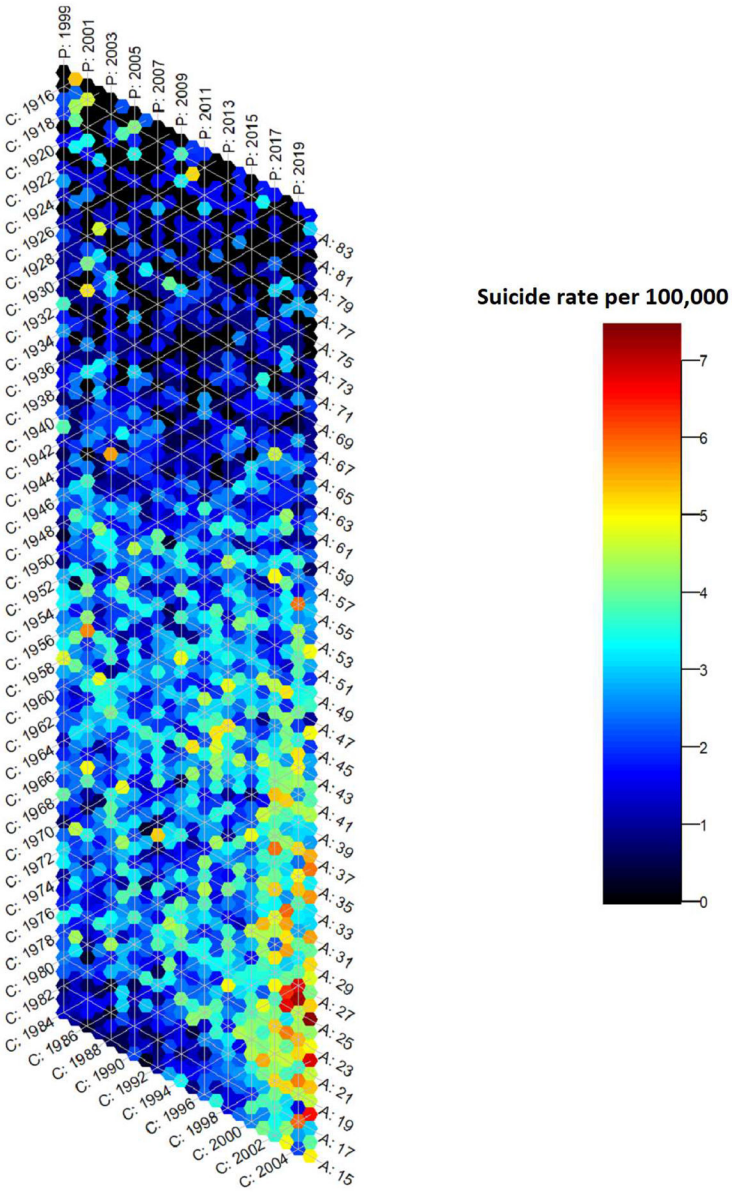

Figure 1. Hexagonal visualization of suicide rates per 100,000 among Black females by age, period, and cohort

*Note: A = Age, P = Period, C = Cohort. All isolines are spaced at 2 years. Suicide rates for each birth cohort are shown with a specific diagonal C isoline, with corresponding ages (A) and periods (P).

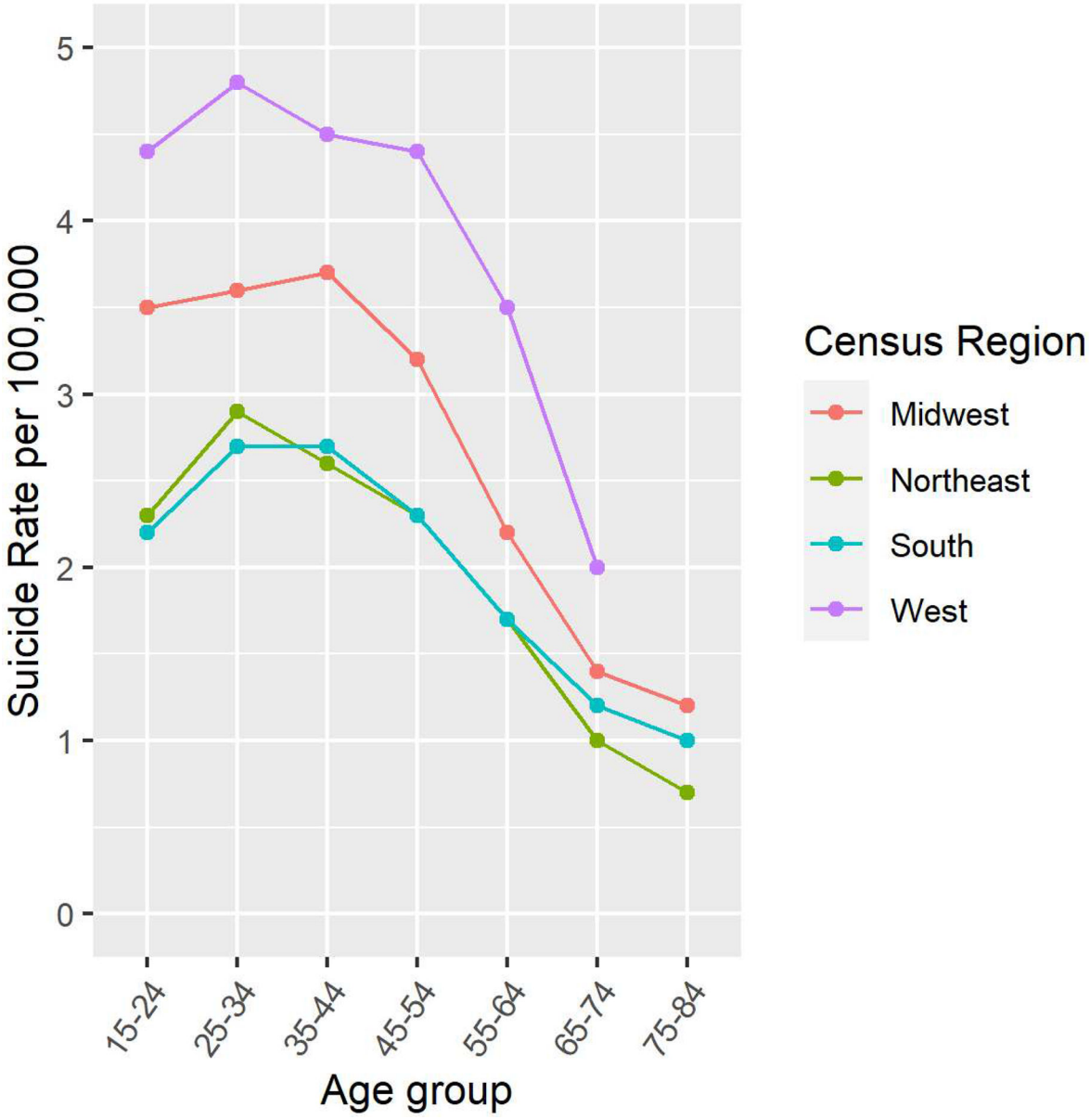

Figure 2. Suicide rates per 100,00 among Black females aged 15-84 years old in the US by census region, 1999-2020

*Note: Age is organized into 10-year groups. Highest age group is omitted for the West region due to low death count.