

ORIGINAL ARTICLE

Intersectionality in pandemic youth suicide attempt trends

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Abstract

Introduction: The COVID-19 pandemic has resulted in increased distress at a societal level, with youth and young people bearing a disproportionate burden. A series of recent Morbidity and Mortality Weekly Reports has highlighted emergency department (ED) visit rates for suicide attempts among youth ages 12–25 during the COVID-19 pandemic. This study expands those analyses by adding race and ethnicity to the examination of suspected suicide attempts among youth.

Methods: This study uses National Syndromic Surveillance Program (NSSP) data for Wisconsin from hospitals that consistently reported ED visits between the study period of January 1, 2019 and September 30, 2021. Suspected suicide attempt visits were identified using the CDC-developed suicide attempt query.

Results: During the study period, there were 8915 ED visits for suicide attempts by children and youth ages 12–25 in Wisconsin's NSSP system. We confirm gendered patterns of ED visit rates for suspected suicide attempts among youth that were first noted in studies using a non-representative national dataset. Large and significant 2019 vs. 2021 increases were noted for Black females ages 12–17 (79% increase) and White non-Hispanic females ages 12–17 (58%), but no significant change for Hispanic females ages 12–17. Black females ages 18–25 had high and relatively stable rates throughout this period.

KEYWORDS

COVID-19 pandemic, disparities, youth suicide

INTRODUCTION

Youth suicide continues to be a major, preventable public health issue. Suicide is the second leading cause of death for individuals ages 10–24 (National Center for Injury Prevention and Control, 2019) and in 2019, suicide in the United States resulted in over 940,000 years of potential life lost before age 65 (Centers for Disease Control and Prevention, 2014). Importantly, death from suicide represents the tip of the iceberg in terms of overall suicidal behavior. It is estimated that there are 8–25

attempted suicides for each suicide death, and this ratio is higher among youth (Bostwick, Pabbati, Geske, & Mckean, 2016). Many more individuals still have suicidal thoughts. Individuals as young as elementary school-aged have been shown to experience suicidal ideation. One study demonstrated that the lifetime prevalence rates for suicidal ideation in elementary school youth were approximately 14% (Lawrence et al., 2021).

The COVID-19 pandemic has resulted in increased distress at a societal level, with youth and young people bearing a disproportionate burden (Making Caring Common

& Harvard Graduate School of Education, 2021). Isolation from peers that resulted from school and recreational closures during the pandemic was associated with increases in distress among youth. A recent study demonstrated that COVID-19 isolation led to a negative impact on young people's lives in terms of physical and mental health (Elbogen, Lanier, Blakey, Wagner, & Tsai, 2021). Another study found that 38% of youth in the study sample met the criteria for moderate or severe psychological distress during the COVID-19 pandemic (Rauschenberg et al., 2021). In October 2021, the American Academy of Pediatrics, the American Academy of Child and Adolescent Psychiatry and the Children's Hospital Association declared a national emergency in child and adolescent mental health (American Academy of Child and Adolescent Psychiatry, 2021), followed in December 2021 by the Surgeon General's advisory on youth mental health. A series of recent Morbidity and Mortality Weekly Reports (MMWR) has highlighted emergency department (ED) visit rates for suicide attempts among youth ages 12–25 during the COVID-19 pandemic (Adjemian et al., 2021; Yard et al., 2021). Those MMWR authors found that, while overall ED visits for suspected suicide attempts declined in 2020 as compared with 2019, ED visits for suicide attempts among adolescent girls (ages 12–17) increased markedly starting in mid-2020 (Adjemian et al., 2021; Yard et al., 2021).

Missing from this nascent literature is an exploration of race and ethnicity and how it intersects with age and gender-based patterns of risk for suicide attempts in the context of the COVID-19 pandemic. In other areas of health, the pandemic has consistently demonstrated the persistence and deepening of racial disparities. Historically, suicide-related outcomes have been one area of health that breaks from most other patterns of racial health disparities, with American Indians having the highest rates of suicide-related outcomes, followed by Whites and with Black rates being the lowest overall. However, prior to the pandemic, scholars and political leaders began to raise the alarm on Black youth suicide as a smaller yet quickly emerging concern, and at least one study has demonstrated that youth suicide attempts are most prevalent among Black, non-Hispanic youth (Ivey-Stephenson et al., 2020). Moreover, many traditional explanations for racial/ethnic differences in suicide-related outcomes hinge on the strength or weakness of community and culture as a protective factor, and this was uniquely disrupted by months of pandemic-induced physical distancing. All of this makes it important to examine racial patterns in youth suicide-related outcomes as a step toward determining the risk for subgroups of young people.

This study addresses this gap in knowledge by adding race and ethnicity to the examination of suspected suicide

attempts among youth. Our driving research questions are (1) Does Wisconsin data demonstrate the same, nationally observed pattern of large increases in suspected suicide attempts among females ages 12–17? (2) Is that national pattern of elevated risk for females ages 12–17 essentially a White pattern, or is it also seen in other groups? (3) More specifically, what recent patterns emerge among traditionally lower-risk females ages 12–17 whose racial or ethnic groups (specifically Black and Hispanic youth) have been disproportionately impacted by the pandemic and its associated social upheaval?

DATASET FOR ANALYSIS

This study uses National Syndromic Surveillance Program (NSSP) data for Wisconsin from hospitals that consistently reported ED visits between the study period of January 1, 2019 and September 30, 2021. At the end of the study period, 95% of Wisconsin's EDs reported data into the NSSP system. Suspected suicide attempt visits were identified using the CDC-developed suicide attempt query, which is the same approach deployed by CDC epidemiologists in the MMWRs referenced earlier (Adjemian et al., 2021; Yard et al., 2021). Results were further limited to Wisconsin hospitals and Wisconsin residents between the ages of 12 and 25. The age range was selected to align with the reporting groups utilized by Yard et al. and Adjemian et al.

Within these parameters, two datasets were selected. First, most of our analysis uses a narrow subset of visits that is optimized for trend analysis. The selection of this dataset follows the process utilized by Adjemian et al. and Yard et al. and is limited to EDs that are reported consistently throughout the reporting period, as defined by a coefficient of variation of less than 30. This trend-restricted Dataset 1 is the source of our main findings. Second, because the subpopulations are narrow, we supplement this primary dataset with an exploration of a larger dataset (Dataset 2: Not Trend-Restricted) in which trend-based ED reporting constraints have been relaxed. For that dataset, all reporting EDs were included, regardless of the consistency of their reporting practices. Table 1 compares these datasets in terms of the number of EDs included, the number of patient counties covered (out of 72 counties in Wisconsin), and the number of resulting youth suicide visits.

During the study period, there were 8915 ED visits for suicide attempts by children and youth ages 12–25 in Wisconsin's NSSP system. Of these, 4787 (54%) ED visits were recorded by facilities that reported consistently and could therefore be used to observe trends not attributable to changes in the number of reporting facilities (Dataset

TABLE 1 Comparison of trend and non-trend datasets used for analysis

| Dataset | EDs reporting | Counties represented | Youth suicide attempt visits |
|------------------------------------|---------------|----------------------|------------------------------|
| Dataset 1: trend-restricted subset | 53 | 65 | 4787 |
| Dataset 2: not trend-restricted | 127 | 71 | 8915 |

TABLE 2 Race and gender composition of trend-based dataset (dataset 1)

| Race/ethnicity | Female | Male |
|--|--------|------|
| American Indian or Alaska Native and non-Hispanic | 69 | 23 |
| Asian and non-Hispanic | 62 | 21 |
| Black or African American and non-Hispanic | 336 | 208 |
| Hispanic or Latino | 346 | 154 |
| Multiracial/Other and non-Hispanic | 53 | 28 |
| Native Hawaiian or Other Pacific Islander and non-Hispanic | 7 | NA |
| Unknown | 418 | 211 |
| White and non-Hispanic | 2054 | 797 |

1). ED visits from facilities that met the inclusion criteria occurred across 53 separate facilities and included young people from 65 of Wisconsin's 72 counties (90%).

Race and ethnicity were missing in 13% of observations in Dataset 1 and 7.5% of observations in Dataset 2. Even when the race is reported, the relatively rare nature of suspected suicide attempt visits, plus Wisconsin's demographics (over 70% of Wisconsin youth ages 12–25 are White non-Hispanic [WNH]), make it difficult to meaningfully examine trends by gender and age for all racial groups. For instance, as can be seen in [Table 2](#) below, Dataset 1 contains fewer than 250 visits for any group of males other than WNH. These numbers quickly diminish when analyzing the data over time and by additional distinctions, such as age group (Bohnert et al., 2013).

To account for the small counts, we focus on the three largest racial and ethnic groups only (Black or African American non-Hispanic, Hispanic or Latino, and WNH). Methodological considerations for dealing with small N are discussed below in Section 3.

METHODS

We first examine the female ages 12–17 demographic relative to the other three groups analyzed by Yard et al. to determine whether Wisconsin reflects their findings. Next, we introduce a binary WNH vs. “Other” category to determine whether the gender and age patterns observed nationally are driven by WNH Wisconsin youth or are more

broadly descriptive of other youth in the aggregate. Third, we aggregate observations across Q1–Q3 to examine 2019 vs. 2021, which allows for analyses for WNH, Black, and Hispanic youth. We conclude by comparing partial (Q1–Q3) 2021 rates across groups using the less constrained Dataset 2, which increases the number of reporting EDs and observations.

Quarterly trends from January 1, 2019 to Q3 2021 were analyzed using two-sided Poisson tests with 95% confidence intervals were used to determine significance. To account for seasonality, trends were compared for the same quarters across years, rather than for adjacent time periods. Quarters 1, 2, and 3 in 2019 were used as the pre-COVID reference periods, which were then compared with the same quarters in 2021. Q4 was excluded from this comparison because observations were not yet available for 2021. As noted by Adjemian et. al, during the initial phases of the pandemic in the United States, visits to emergency rooms decreased dramatically as patients tried to avoid hospitals as possible sites of COVID transmission. Thus, data from 2020, particularly Q1 and Q2, are more difficult to interpret. For that reason, comparisons are more generally made in this study between 2019 and 2021, although 2020 data appears throughout.

Visit rates and rate ratios are calculated as age-adjusted, race-specific visit rates per 100,000 residents. NSSP data are de-identified. Thus, the rates provided here should be understood as group-specific incidence rates where the same individual may be counted more than once if they have more than one ED visit during the study period. Rate denominators were based on 2019 and 2020 Wisconsin annual population estimates (U.S. Census Bureau, 2019 and 2020). Given that 2021 estimates are not yet available, we averaged estimates from 2019 and 2020 for use throughout the study period. Data were disaggregated along with age bands, sex, and alternately race/ethnicity or a binary racial/ethnic variable separating WNH from all other identified (non-missing) racial and ethnic groups. Observations with missing race and ethnicity data were excluded.

State-level population estimates used for rate denominators are not a perfect match for the hospital catchment areas covered by the ESSENCE data used here. However, as described in the Data section, the ED data covers most of the state, including major population centers. It is also comparable to Wisconsin's racial breakdown for these groups (see [Table 3](#) below).

RESULTS: WISCONSIN DATA REFLECTS NATIONAL TRENDS

As with national data (Yard et al., 2021), in Wisconsin youth suicide attempts rose in 2019 and into 2020. When COVID was declared a pandemic in March 2020, ED visits overall plummeted, as would-be patients avoided possible COVID-19 exposure in hospitals. Youth ED visits for suicide attempts then returned more quickly than other types of visits (as measured in percent of all ED visits) until eventually reaching and then surpassing 2019 levels by late 2020. [Figure 1](#) below shows this overall trend for Wisconsin.

As Adjemian et al. and Yard et al. have noted, trends in attempts were not uniform among youth. Rather, there were significant differences by age and sex, with notable 2019 vs. 2021 increases emerging only for females ages 12–17. [Figure 2](#) displays Wisconsin's breakdown by gender and age group.

[Figure 2](#) shows that ED visits for suspected suicide attempts among Wisconsin females ages 12–17 demonstrated the expected pattern of relatively high visit rates that increased above 2019 levels. This pattern is not replicated by any of the other age and gender groups. Rather, similar to national data, there are a slight increase for females ages 18–25 and modest decreases for both males ages 12–17 and males ages 18–25. At the beginning of the study period, there were 3.2 times as many visits for females ages 12–17 as males ages 12–17, a divergence which peaked at 4.5 by Q2 of 2021. This compares with Yard

et al.'s peak rate ratio of 3.44 for 2019–2021 comparisons for February and March.

[Table 4](#) shows the percentage change over time for females ages 12–17 and males ages 12–17. The analysis compares changes between quarters across years, for example, the change between Q1 2020 and the same time period in 2019. The reference year for all percentages is 2019, to show differences from the pre-COVID period.

WI females ages 12–17 showed significant year-to-year increases ranging from 29.7% to 47.6%. During the same period, Wisconsin males showed a very different pattern. Before the pandemic, Wisconsin's males in this age group also saw increases over their 2019 numbers (29.4%). However, after that point, the number of visits decreased sharply and remained below 2019 figures for the remainder of the study period.

Trends in youth attempts by age, gender, and binary race variable

Next, we use a dummy race variable of WNH vs. other to examine whether the patterns noted above are driven by WNH youth. The results indicated that patterns were not driven by WNH youth. Overall, the mean quarterly visit rates during this time are actually higher for the “Other” group (41.8 [38.5, 45.1]) of youth than for WNH (33.2 [30.1, 36.2]), but those differences are driven by the 18–25-year-old age groups (both males and females). As seen in [Figure 3](#), the 12–17-year-olds in both the WNH

TABLE 3 Racial/ethnic composition of Wisconsin population vs. datasets

| Race/ethnicity | Population | Dataset 1 (trends) | Dataset 2 (no trends) |
|---|------------|--------------------|-----------------------|
| Ages 12–17 | | | |
| American Indian or Alaska Native | 1% | 2% | 3% |
| Asian | 3% | 2% | 2% |
| Black or African American | 8% | 11% | 8% |
| Native Hawaiian or other Pacific Islander | 0% | 0% | 0% |
| Other race | 4% | 1% | 2% |
| White | 72% | 76% | 66% |
| Hispanic | 12% | 8% | 9% |
| Ages 18–25 | | | |
| American Indian or Alaska Native | 1% | 1% | 2% |
| Asian | 4% | 2% | 2% |
| Black or African American | 8% | 20% | 15% |
| Native Hawaiian or other Pacific Islander | 0% | 0% | 0% |
| Other race | 3% | 1% | 3% |
| White | 72% | 67% | 63% |
| Hispanic | 9% | 9% | 8% |

Note: All groups are non-Hispanic unless otherwise noted.

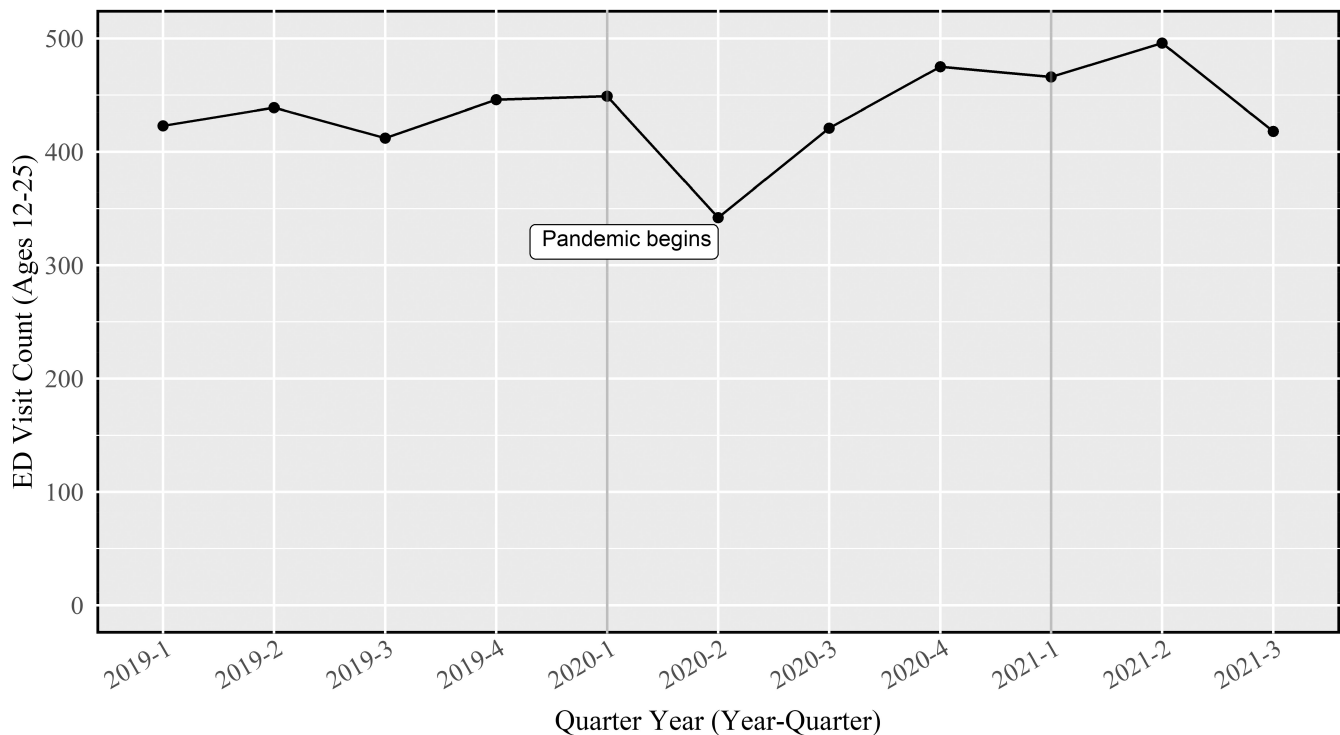


FIGURE 1 Wisconsin ED visits for suspected youth suicide attempts. Based on the trend-restricted dataset from emergency departments (ED's) that consistently reported data from January 1, 2019 to September 30, 2021. ED visit count is the number of unique ED visits for suspected suicide attempts for all youth ages 12–25. Visit counts are aggregated and reported by quarter years (year-quarter). Vertical lines separate calendar years. The beginning of the COVID-19 pandemic in mid-March 2020 (end of 2020-1) and subsequent lockdown (2020-1-2) corresponded with a notable dip in an otherwise upward trend

and “Other” groups display similar trends during this time, across gender.

Binary race differences converge over time for males but not for females. [Table 5](#) below shows the magnitude of the change over time for each of the 12–17-year-old age groups.

[Table 5](#) demonstrates that both WNH and Other teen females show significant increases in ED visits for suspected suicide attempts in multiple quarters. The increase is larger for White females ages 12–17 than for the “Other” category, with White females’ increases ranging from 41.6% to 71.6%, while all other females ages 12–17 combined had increases of 40%–50%.

Data for males ages 12–17 show more fluctuation. Visits for White males ages 12–17 for Q1 2020 were nearly double their 2019 baseline, before dropping off precipitously in Q2 and Q3, then more than doubling from 2019 levels at the end of 2020 and fluctuating without any significant change into 2021. All other males ages 12–17 similarly experienced changes ranging from halving to almost doubling during this time.

[Table 6](#) shows that the expected trends for older youth (ages 18–25), hold for both WNH and Other youth. Across gender and binary race variables, this age group experienced either no significant changes or decreases in suicide

attempt rates during this period. Males experienced significant decreases in suicide attempt rates from 2019. WNH males experienced decreases (though not all significant) in almost every quarter, the largest being a 46.2% decrease from Q3 2019 to Q3 2020. Similarly, males of color (“Other Males”) ages 18–25 saw visits drop off by 42.9% from Q3 2019 to Q3 2021.

Comparison of 2019 vs. 2021 Partial-Year rates by race, gender and age

Given the small number of available data points for each race/ethnicity subgroup, we move from quarterly trend analysis to instead comparing in-process 2021 data to the same period from 2019, that is, Q1 through Q3 ([Table 7](#)).

Looking at the female ages 12–17 demographic, all three race/ethnicity groups have higher 2021 visit rates than the other youth subgroups (291.0 for Black females, 230.5 for Hispanic, and 275.2 for Whites). Black females ages 12–17 had the largest increase (79%); their visit rate during this time increased from 162 to 291 per 100,000. Though they did not have the highest rates in 2019, by 2021 their rates had surpassed those of other groups with higher 2019 rates, including young Black women (18–25) and WNH

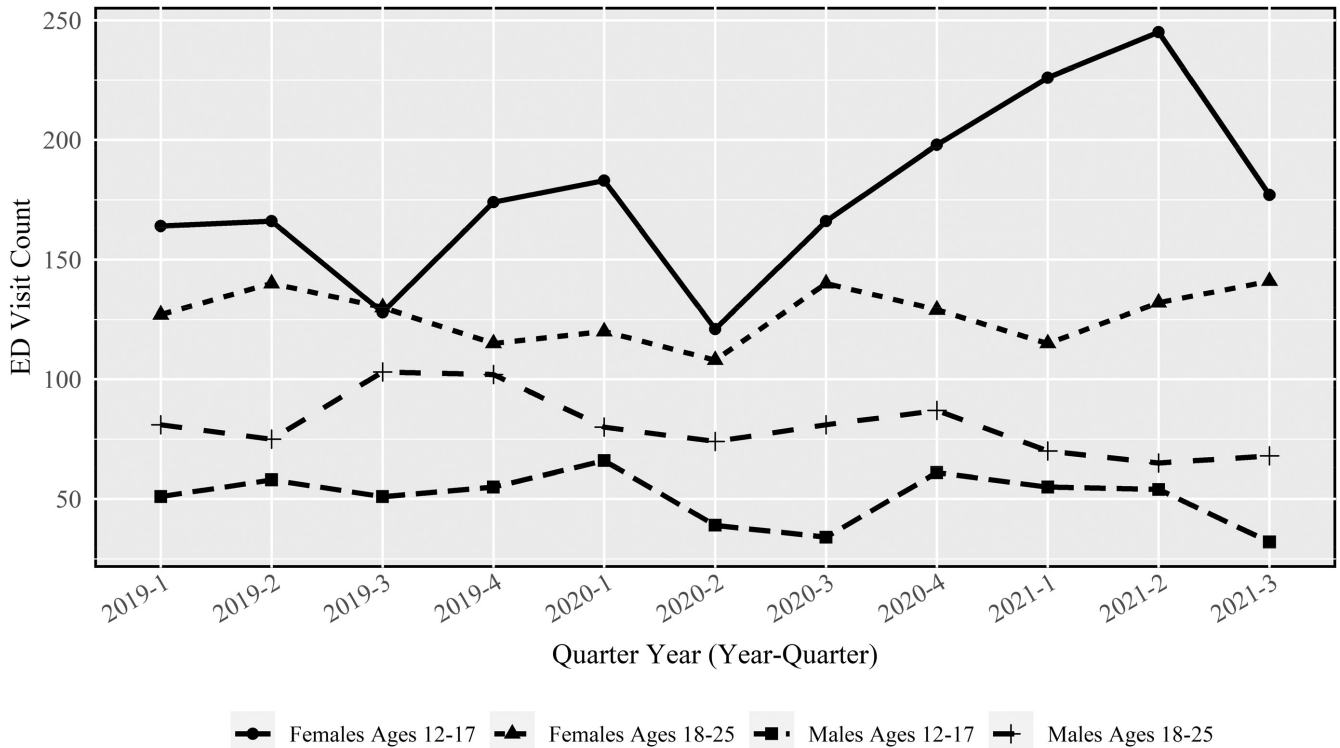


FIGURE 2 Trend-restricted ED visit counts by age and gender. Suspected suicide attempt visit counts are displayed for females ages 12–17, females ages 18–25, males ages 12–17 and males ages 18–25. Females ages 12–17 had the highest number of visits and most clearly both the upward trend and the initial pandemic dip in 2020-2. Females ages 18–25 had the next highest number of visits, followed by males ages 18–25. Males ages 12–17 had the lowest number of visits

| Q | Visits by year (n) | | | % change 2019–2020 | | % change 2019–2021 | |
|----------------|--------------------|------|------|--------------------|---------|--------------------|----------|
| | 2019 | 2020 | 2021 | % | p-Value | % | p-Value |
| Females | | | | | | | |
| 1 | 164 | 183 | 226 | 11.6 | 0.138 | 37.8 | 0.000*** |
| 2 | 166 | 121 | 245 | –27.1 | 0*** | 47.6 | 0.000*** |
| 3 | 128 | 166 | 177 | 29.7 | 0.001** | 38.3 | 0.000*** |
| 4 | 174 | 198 | 0 | 13.8 | 0.075 | NA | |
| Males | | | | | | | |
| 1 | 51 | 66 | 55 | 29.4 | 0.042* | 7.8 | 0.575 |
| 2 | 58 | 39 | 54 | –32.8 | 0.01* | –6.9 | 0.646 |
| 3 | 51 | 34 | 32 | –33.3 | 0.014* | –37.3 | 0.006** |
| 4 | 55 | 61 | 0 | 10.9 | 0.418 | NA | |

TABLE 4 Quarterly changes for ages 12–17 by gender

Note: Q represents quarter. Significance Levels: * < 0.05, ** < 0.01, *** < 0.001.

and Hispanic females ages 12–17, although differences were not statistically significant. WNH females ages 12–17 experienced the second-largest increase (58%), with rates increasing from 174 to 276 per 100,000. Hispanic females ages 12–17 experienced no significant increase during this time and had 2021 rates below those of Black and WNH females ages 12–17. Across racial groups, males ages 12–17 and females ages 18–25 had no significant changes, while males ages 18–25 demonstrated significant decreases.

EXAMINATION OF 2021 RATE RATIOS WITHIN RACIAL GROUPS

Finally, we draw from the non-trend restricted dataset (Dataset 2) to examine females ages 12–17 rate ratios compared with males ages 12–17 and females ages 18–25 for each racial group. Nearly twice as large as Dataset 1, this dataset provides more observations per subgroup, yet is less than ideal for trend analyses, due to the allowance for

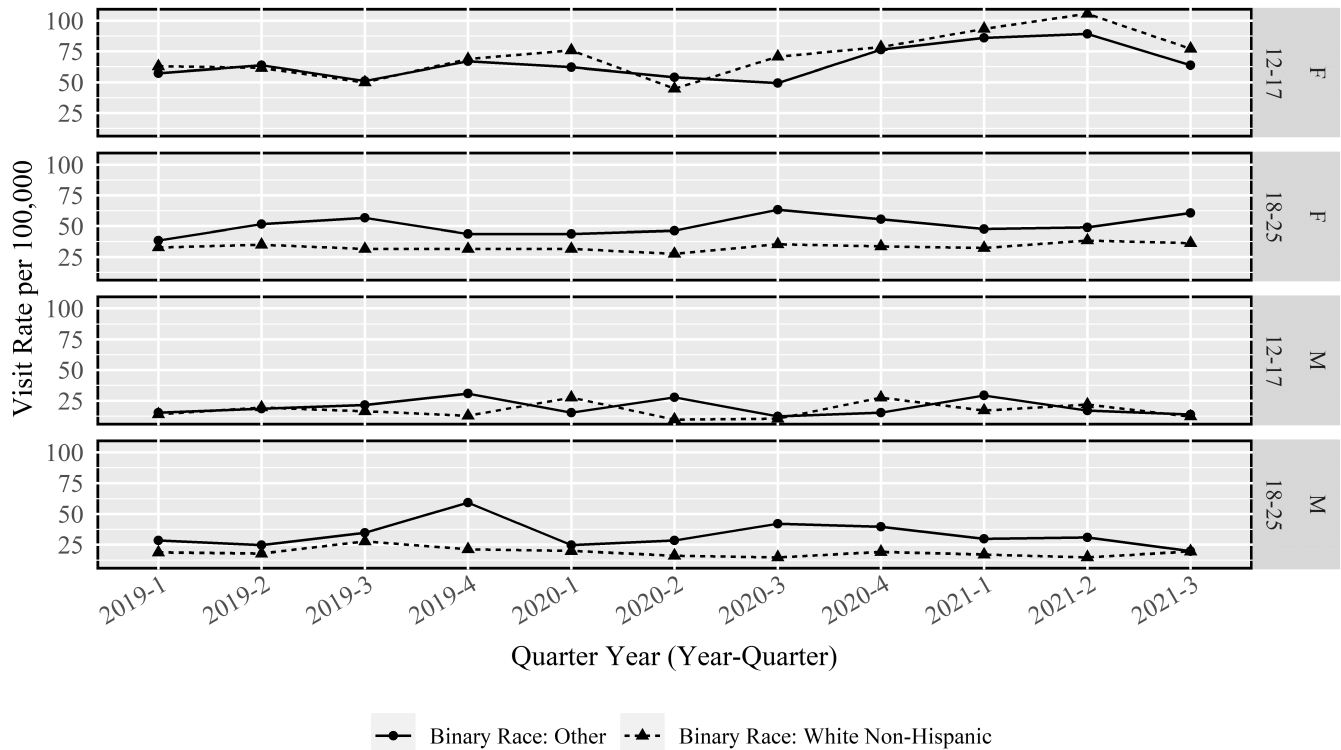


FIGURE 3 ED visit rates by gender, age, and binary race variable. The dotted lines in each facet represent the suicide attempt visit rates per 100,000 white non-Hispanic youth in the respective gender and age group, while the solid lines represent the rates for youth from all other races/ethnicities in that gender and age group. Among 18–25-year-olds, rates tended to be higher for the youth of color (“Binary Race: Other”). Race-based patterns were less consistent for the younger age group, although for females ages 12–17 (“F 12–17”), white non-Hispanics had higher visit rates through most of 2020 and 2021

variability in reporting throughout the study period (e.g., the number of reporting ED’s varied from 100 in 2019 to 123 in 2020 before decreasing slightly to 119) in 2021. We account for this by restricting our analysis to 2021 data rather than examining trends. However, [Table 8](#) demonstrates that, despite changes to the number of ED’s reporting each year, the extent of geographic (“Counties”) and demographic coverage (“Black [%]”) in this dataset remained largely unchanged from 2019 through 2021.

[Table 9](#) displays visit rate ratio comparisons by race/ethnicity. Females ages 12–17 are compared to a reference group based on either age (males ages 12–17) or gender (females ages 18–25). Males ages 18–25 were excluded as a comparison group, as previous analyses have already established that that subgroup experienced declining rates.

[Table 9](#) shows the considerable gender differences between youth ages 12–17 across racial groups, with female visit rates ranging from 3.2 to 5 times those of same-age males. For all racial groups, females ages 12–17 also had higher 2021 rates than their ages 18–25 counterparts, although in this case, differences were a more modest 1.1–2.6 times greater for the younger females.

In this expanded dataset, the female ages 12–17 demographic has higher visit rates within, but not always across, racial categories. For instance, while Black females ages 18–25 have lower visit rates than Black females ages 12–17, their rate is higher than Hispanic females ages 12–17.

DISCUSSION

This study has several findings that contribute to our understanding of suicide-related outcomes for youth during the COVID-19 pandemic. First, our state-level results mirror national findings of an initial drop-off of ED visits in the immediate wake of the pandemic, followed by large and significant increases among females ages 12–17 (Adjemian et al., 2021; Yard et al., 2021). Second, despite the fact that Wisconsin has a high percentage of WNH residents and the expectation of higher suicidality among WNHs, these increases are not merely driven by WNH youth. Rather, they are found in both WNH and “Other” youth. Third, our findings demonstrate significant 2019 vs. 2021 increases for Black females ages 12–17

TABLE 5 Quarterly changes for ages 12–17 by gender and binary race grouping

| Q | Visits by year (n) | | | % change 2019–2020 | | % change 2019–2021 | |
|--|--------------------|------|------|--------------------|----------|--------------------|----------|
| | 2019 | 2020 | 2021 | % | p-Value | % | p-Value |
| White Non-Hispanic Females, Ages 12–17 | | | | | | | |
| 1 | 97 | 117 | 144 | 20.6 | 0.047* | 48.5 | 0.000*** |
| 2 | 95 | 69 | 163 | –27.4 | 0.006** | 71.6 | 0.000*** |
| 3 | 77 | 109 | 119 | 41.6 | 0.001*** | 54.5 | 0.000*** |
| 4 | 106 | 121 | 0 | 14.2 | 0.145 | NA | |
| Other Females, Ages 12–17 | | | | | | | |
| 1 | 36 | 39 | 54 | 8.3 | 0.616 | 50.0 | 0.004** |
| 2 | 40 | 34 | 56 | –15.0 | 0.384 | 40.0 | 0.017* |
| 3 | 32 | 31 | 40 | –3.1 | 1 | 25.0 | 0.157 |
| 4 | 42 | 48 | 0 | 14.3 | 0.354 | NA | |
| White Non-Hispanic Males, Ages 12–17 | | | | | | | |
| 1 | 23 | 45 | 28 | 95.7 | 0.000*** | 21.7 | 0.295 |
| 2 | 32 | 16 | 36 | –50.0 | 0.003** | 12.5 | 0.478 |
| 3 | 27 | 17 | 20 | –37.0 | 0.054 | –25.9 | 0.21 |
| 4 | 21 | 45 | 0 | 114.3 | 0.000*** | NA | |
| Other Males, Ages 12–17 | | | | | | | |
| 1 | 10 | 10 | 19 | 0.0 | 1 | 90.0 | 0.01** |
| 2 | 12 | 18 | 11 | 50.0 | 0.109 | –8.3 | 1 |
| 3 | 14 | 8 | 9 | –42.9 | 0.139 | –35.7 | 0.227 |
| 4 | 20 | 10 | 0 | –50.0 | 0.024* | NA | |

Note: Q represents quarter. Significance Levels: * < 0.05, ** < 0.01, *** < 0.001.

(79% increase) and WNH females ages 12–17 (58%), but no significant change for Hispanic females ages 12–17. Fourth, regardless of age and gender, Wisconsin's data surprisingly show consistently (but not always significantly) higher ED visit rates for suspected suicide attempts among Black youth vs. WNH youth throughout the study period. Our 2021 analysis using non-trend restricted data shows young Black women's visit rates were higher than any other group except Black females ages 12–17.

These findings bolster recent national (Centers for Disease Control and Prevention, 2020) and Wisconsin-specific Youth Risk Behavior Survey results indicating higher prevalence rates for suicide attempts among Black students, as compared to WNH and Hispanic students (Wisconsin Office of Children's Mental Health, 2021). Here we see an alignment between youth's (pre-pandemic) self-reports of suicide attempts and the subsequent racial patterns of suicide attempt ED visits. As such, the findings from this study strongly support recent calls (Bridge et al., 2018; Riley, O'Reilly, & Adams, 2021; Sheftall & Miller, 2021) for greater attention to suicide risk among Black youth (Congressional Black Caucus, 2019; Mushunje & Graves, 2021).

This study is limited to ED visits for suspected suicide attempts in one state. ED visit rates are one measure of group suicide risk. A complete picture of youth suicide risk during this time requires also looking at suicide mortality data, as well as additional attempt-related factors such as injury severity and prior attempt history.

Wisconsin attempt data are limited by the relatively small number of observations from specific subgroups. This precludes analysis of some racial groups that are known to be at high risk for suicidality, specifically, American Indian youth. Future studies that can draw upon more observations will help to determine whether Wisconsin's patterns hold over time and in other locations.

CONCLUSION

The COVID-19 pandemic led to unprecedented and unpredictable changes, and with these changes came significant distress at the individual and community levels. Youth and young people were not immune to this increased distress. This study examined the intersection of race, gender, and age in the context of pandemic-era youth suicidality and adds to our understanding of how

TABLE 6 Quarterly changes for ages 18–25 by gender and binary race grouping

| Q | Visits by year (n) | | | % change 2019–2020 | | % change 2019–2021 | |
|--|--------------------|------|------|--------------------|----------|--------------------|---------|
| | 2019 | 2020 | 2021 | % | p-Value | % | p-Value |
| White non-hispanic females, ages 18–25 | | | | | | | |
| 1 | 75 | 72 | 74 | −4.0 | 0.773 | −1.3 | 1 |
| 2 | 80 | 63 | 88 | −21.2 | 0.057 | 10.0 | 0.371 |
| 3 | 72 | 81 | 83 | 12.5 | 0.288 | 15.3 | 0.194 |
| 4 | 72 | 77 | 0 | 6.9 | 0.555 | NA | |
| Other Females, Ages 18–25 | | | | | | | |
| 1 | 29 | 33 | 36 | 13.8 | 0.456 | 24.1 | 0.193 |
| 2 | 39 | 35 | 37 | −10.3 | 0.575 | −5.1 | 0.81 |
| 3 | 43 | 48 | 46 | 11.6 | 0.445 | 7.0 | 0.647 |
| 4 | 33 | 42 | 0 | 27.3 | 0.117 | NA | |
| White Non-Hispanic Males, Ages 18–25 | | | | | | | |
| 1 | 44 | 47 | 40 | 6.8 | 0.65 | −9.1 | 0.598 |
| 2 | 42 | 38 | 35 | −9.5 | 0.589 | −16.7 | 0.315 |
| 3 | 65 | 35 | 46 | −46.2 | 0.000*** | −29.2 | 0.018* |
| 4 | 50 | 45 | 0 | −10.0 | 0.525 | NA | |
| Other Males, Ages 18–25 | | | | | | | |
| 1 | 23 | 20 | 24 | −13.0 | 0.602 | 4.3 | 0.834 |
| 2 | 20 | 23 | 25 | 15.0 | 0.5 | 25.0 | 0.262 |
| 3 | 28 | 34 | 16 | 21.4 | 0.255 | −42.9 | 0.023* |
| 4 | 48 | 32 | 0 | −33.3 | 0.021* | NA | |

Note: Q represents quarter. Significance Levels: * < 0.05, ** < 0.01, *** < 0.001.

TABLE 7 Comparison of 2019 vs. 2021 visit rates for Q1–Q3, by subgroup

| Category | Visits by year (n) | | Rate (per 100,000) | | Change 2019–2021 | |
|------------------------------|--------------------|------|--------------------|-------|------------------|----------|
| | 2019 | 2021 | 2019 | 2021 | Rate ratio | p-Value |
| Black females, ages 12–17 | 29 | 52 | 162.3 | 291.0 | 1.79 | 0.000*** |
| Hispanic females, ages 12–17 | 54 | 60 | 207.4 | 230.5 | 1.11 | 0.413 |
| White females, ages 12–17 | 269 | 426 | 174.4 | 276.2 | 1.58 | 0.000*** |
| Black females, ages 18–25 | 51 | 47 | 221.4 | 204.0 | 0.92 | 0.624 |
| Hispanic females, ages 18–25 | 41 | 45 | 143.4 | 157.4 | 1.10 | 0.531 |
| White females, ages 18–25 | 227 | 245 | 99.1 | 106.9 | 1.08 | 0.232 |
| Black males, ages 12–17 | 11 | 16 | 57.7 | 83.9 | 1.45 | 0.130 |
| Hispanic males, ages 12–17 | 17 | 17 | 62.6 | 62.6 | 1.00 | 1.000 |
| White males, ages 12–17 | 82 | 84 | 50.4 | 51.6 | 1.02 | 0.825 |
| Black males, ages 18–25 | 48 | 33 | 186.2 | 128.0 | 0.69 | 0.030* |
| Hispanic males, ages 18–25 | 12 | 24 | 40.4 | 80.8 | 2.00 | 0.002** |
| White males, ages 18–25 | 151 | 121 | 64.1 | 51.4 | 0.80 | 0.013* |

Note: Rates are cumulative incidence per 100,000 for the first three quarters of each year. Rate ratio is for 2021 vs. 2019. Significance Levels: * < 0.05, ** < 0.01, *** < 0.001.

increased distress in light of the pandemic resulted in changes in suicide attempts for youth and young adults. This study further confirmed the high suicide attempt rates among females ages 12–17 and determined that this

was a demographic at high risk across races and ethnicities. Importantly, in the context of a pandemic that has dramatically exacerbated existing racial health disparities, this study draws attention to the need to re-examine the

TABLE 8 Dataset 2 coverage by year

| Year | EDs (n) | Counties (n) | Visits (n) | Black (%) |
|-------------------|---------|--------------|------------|-----------|
| 2019 | 100 | 69 | 2882 | 11.6 |
| 2020 | 123 | 68 | 3315 | 11.9 |
| 2021 ^a | 119 | 68 | 2717 | 11.2 |

^a2021 data through Q3 only.

TABLE 9 Partial 2021 (Q1–Q3) visit rate ratio comparisons using relaxed ED inclusion criteria (Dataset 2)

| Race | 2021 visit rates (per 100,000) | | | Rate ratios: Females 12–17 to reference group | |
|--------------------|--------------------------------|---------------|-------------|---|------------------|
| | Females 12–17 | Females 18–25 | Males 12–17 | To males 12–17 | To females 18–25 |
| Black non-hispanic | 526.0 | 473.1 | 104.8 | 5.02 | 1.11 |
| Hispanic | 388.0 | 227.3 | 121.4 | 3.20 | 1.71 |
| White non-hispanic | 560.7 | 214.3 | 113.6 | 4.94 | 2.62 |

presumption of lower suicide risk for Hispanic and, especially, Black youth.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

Data are available upon reasonable request.

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