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Intersectional trends in child and adolescent suicide-related emergency department encounters in Florida (2016–2021)

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Abstract

Objectives: Emergency department (ED) visits resulting from suicidal thoughts and behaviors have increased at alarming rates among youth in the United States in recent years. Understanding trends among specific racial, ethnic, gender, and/or age subgroups can provide the foundation for tailored solutions for those with the greatest need for support.

Methods: Using data from the Florida State Emergency Department Database from 2016 to 2021, we calculated annual rates of ED suicide-related diagnoses per 1000 young people aged 8–21 years. We explored annual trends by age and intersectional race/ethnicity and sex subgroups. Additionally, we examined subgroup-specific stratified percent changes from 2016 to 2019 and 2016 to 2021.

Results: Among 8–12-year olds, the highest rates of suicide-related ED encounters occurred among Black males and females and this trend was steady over time. Among 13–21-year-old patients, Black and White females displayed the highest rates of suicide-related ED encounters across 2016–2021, and all subgroups experienced a slight decline in 2020 and 2021. Rates generally increased between 2016 and 2019, with the largest percent increase (10.6%) occurring among Black females aged 18–21 years, whereas there was a trend of decreased rates among most subgroups between 2019 and 2021.

Conclusions: Across all years and age groups, Black females showed consistently higher rates of suicide-related ED encounters than almost any other subgroup, supporting previous research that Black adolescent females may be disproportionately suffering from the mental health crisis faced by young people. Furthermore, preteen Black males need additional mental health support, as do adolescent and young adult White females.

KEYWORDS
adolescent, disparities, equity, mental health, prevention, screening, suicide

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1 | INTRODUCTION

1.1 | Background

Suicide deaths and emergency department (ED) visits resulting from suicidal thoughts and behaviors have been increasing at disturbing rates among adolescents and young adults in the United States in recent years, and increases have been most pronounced among some racially minoritized and younger age groups.[1–2] Despite decades of research and national agendas, rates have continued to climb. One potential reason is that too often, we focus on average rates, when in fact, the increases we see overall are being driven by specific subgroups with the greatest needs. Thus, it is critical to take an intersectional perspective to further break down who are the groups that face the most substantial risk. This knowledge will provide the foundation for supports and solutions tailored to groups of young people with the greatest need for suicide prevention programming.

The Bottom Line

Understanding the characteristics of suicidal patients is important for providing individualized and optimal care. This study examined trends in children and adolescents presenting to the emergency department with suicidal thoughts and/or behaviors. For younger children aged 8–12 years, rates of suicidality for black males and females have risen steadily since 2016. Among older teens, black and white females exhibited the highest rates of suicidality. This information identifies higher risk populations for targeted interventions.

1.2 | Importance

This study aims to incorporate an intersectional perspective in suicide-related research, recognizing the distinct forms of discrimination faced by individuals who belong to multiple marginalized groups.[3,4] Within racially and ethnically minoritized groups in the United States, young people experience subgroup-specific stressors and sociocultural constructs, which can contribute to the emergence of mental health problems.[4,5] Historical and political events, particularly in the past decade, and related to the COVID-19 pandemic, including racial violence, increase in mass shootings, and charged political environments, have been associated with increased stress and reduced mental health for all young people.[6,7–8] Among Black youth, worsening mental health has been associated with stress and racism-related anxiety, all within in the context of police-involved deaths of unarmed Black individuals, as well as the disproportionate impact of the COVID-19 pandemic on the health and wellbeing of the Black community in the United States.[3,9–10] Similarly, indigenous youth have experienced some of the highest increases in worsening mental health, including suicide, largely related to the ripple effects of the COVID-19 pandemic, systematic and chronic underfunding of services, and the lasting and ongoing effects of historical trauma.[11] Among Hispanic and Latino/a/x youth, increases in anxiety, depression, and suicidal thoughts and behaviors have been associated with trauma and stress related to migration and acculturation, as well as racism and the impact of COVID-19.[6,12,13] Some Hispanic/Latino/a/x youth also experienced heightened externalizing and internalizing symptoms during the pandemic, a phenomenon attributed to elevated childcare responsibilities and perceived financial instability.[14] Previous studies have found pronounced negative mental health indicators among LGBTQIA+ young people, especially those belonging to minoritized races or ethnicities.[4] Some previous work has found that females across all races and ethnicities have experienced greater negative internalizing stress as a result of the pandemic than male peers,[15–16] and it is yet to be seen how stress related to changes in state-level reproductive rights may be impact the mental health of female youth.

In this work, we seek to identify specific recent trends in suicide-related ED visits among young people by age, sex, race, and/or ethnic subgroup using data from the state of Florida. We chose to focus on trends in Florida for several reasons. Florida is a somewhat diverse state, home to 51.5% White, 26.5% Hispanic/Latinx, and 14.5% Black residents.[17] Florida has traditionally been known politically as a "swing state" but voted for Republican candidates in 2016 and 2020. There is a long history of structural and cultural racism in Florida, which has led to lasting disparities in housing, employment, education, and health.[18,19] Anti-migration policies have created corresponding disparities within some parts of the Hispanic community, which has worsened since 2016.[20,21] In the years following the Presidential election in 2016, existing racial tension in the United States was magnified by a divided political environment, and compounded by events such as police-involved violence against Black citizens.[5,10] Finally, Florida has been among the states using legislation to restrict reproductive rights in recent years, and while most legislation has gone into effect since the years included in this work, the looming possibility of these changes could well have been a source of increased stress for female residents from 2016 to 2021.[22]

1.3 | Goals

We aim to begin to tease apart the complex web of intersectional identity to understand the extent to which unique stressors of the past several years may be disproportionately impacting some subgroups of youth more than others in this state. By understanding which groups are in the greatest need of mental health care and suicide prevention services, we hope to inform tailored suicide prevention efforts that specifically aim to address these growing concerns in the populations most in need.

2 | METHODS

2.1 | Design and setting

We conducted a retrospective cohort study of ED visit data derived from the Healthcare Cost and Utilization Project (HCUP) Florida State Emergency Department Database (SEDD) from 2016 to 2021. The Florida SEDD is a complete registry of annual discharges from all Florida EDs that do not result in an admission and includes diagnoses and procedures, patient demographics (e.g., age, race, ethnicity, and sex), insurance information, and total charges. Detailed information on the SEDD is available on the HCUP website. This study was determined to be exempt from full Institutional Review Board review by the Johns Hopkins University School of Medicine IRB.

2.2 | Measures/outcomes

Age was grouped into three categories: 8–12 years, 13–17 years, and 18–21 years. Race and ethnicity were classified according to the groupings within the SEDD, which included: "White," "Black," "Hispanic," "Asian or Pacific Islander," "Native American," and "Other." Patients with a listed race of "Other" were excluded from this analysis because it was not possible to attain census denominator data for this group. Due to the very small number of patients in the American Indian/Alaskan Native (AI/AN) subgroup (called "Native American" in the SEDD) and the Asian American and Pacific Islander (AAPI) subgroup (called "Asian or Pacific Islander" in the SEDD), this analysis focused only on White, Black, and Hispanic patients. We use the term "Hispanic" to describe the Hispanic/Latino/a/x patients in the analysis because this is the term used within the SEDD. The SEDD reports sex classified only as "male" or "female"; thus, those groupings were used in this analysis and the term "sex" was used, although it bears noting that we do not have information about biological sex or gender identity. Intersectional subgroups were generated by combining sex and race/ethnicity group (i.e., Black female, Black male, Hispanic female, Hispanic male, White female, and White male).

ICD-10 diagnosis codes were used to classify patients with suicide-related diagnoses (Table S1). For the outcome of suicide-related ED visits, we used a broad classification that encompassed all potential suicide-related discharge diagnoses, including suicidal thoughts and/or behaviors, suicide attempt, and/or intentional self-harm with suicidal intent, to ensure that no suicide risk-related encounter would be missed due to misspecification (see Table S1).[1,23] It should be noted that the SEDD only includes ED encounters that do not result in an admission, so the results of this work are only generalizable to that subgroup of patients. The number of suicide-related ED encounters was calculated for each age, race/ethnicity, and sex subgroup, and this was used as the numerator in for the ED suicide-related diagnosis rates. Corresponding denominators for each group and year were collected from the US Census Bureau resources and rates were calculated separately for each age, race/ethnicity, and sex subgroup.[17] Given the structure of the SEDD, it is possible that the same patient could have multiple ED encounters in 1 year, so we used the "Visit-link" measure within the SEDD to ensure that any patient with a suicide-related ED encounter was only counted once per year in the numerator.

2.3 | Data analysis

Annual incidence rates of ED suicide-related diagnoses were calculated by race/ethnicity, sex, and age subgroup per 1000 persons and plotted separately to compare annual trends. Additionally, we calculated the subgroup-specific stratified percent change in rates from 2016 to 2019 and 2020 to 2021. The change between 2016 and 2019 was chosen to understand trends leading up to the COVID-19 pandemic. The time period of 2019–2021 was separated because suicide-related data from 2020 and 2021 have been fraught with data quality problems; it is widely believed that suicide-related ED encounters during this time period may be underestimated because both COVID-19-overwhelmed hospitals and patients were not seeking treatment for reasons related to COVID-19.[24] All analyses were conducted using Stata software (version 18.0).[25]

3 | RESULTS

The study population comprising the numerator in the analysis is detailed in Table 1. A total of $n = 95{,}667$ patients had a suicide-related ED encounter between 2016 and 2021. The age distribution included 19.1% of patients between 8 and 12 years old, 35.6% between 13 and 17 years old, and 45.2% between 18 and 21 years old. Females comprised 61.2% of the patient cohort, 47.4% of patients identified as White, 25.5% identified as Black, 23.2% identified as Hispanic, 0.8% identified as AAPI, 0.1% identified as AI/AN, and 2.9% identified as another unlisted race ("other"). In terms of insurance type, 28.7% of patients listed a primary payor as private health insurance, 53.4% listed public health insurance, and 18.0% had no insurance or listed "other" (Table 1).

Among the 8–12-year-old subgroup, the highest rates of suicide-related ED encounters over time occurred among Black males and females (Figure 1). These trends for these subgroups remained steady, largely between 4 and 5 per 1000 from 2016 to 2019, then dropped to at or below 3 per 1000 in 2020 and 2021. Hispanic and White males and females followed a similar trend but started with rates between 2.5 and 3 per 1000 and then dropping slightly in 2020 and 2021. Among the 13–17-year-old subgroup, Black females and White females display the highest rates of suicide-related ED encounters, largely between 7 and 9 per 1000, with a dip in rates in 2020 (Figure 2). Hispanic females, Black males, White males, and Hispanic males display a similar pattern, but slightly lower rates, with Hispanic females ranging between 4 and 5 per 1000 and Hispanic males between 2 and 3 per 1000. The 18–21-year-old subgroup displays a very similar pattern, but the rates among Black females and White females are even higher, tracking between 11 and 14 per 1000 prior to 2020 and dipping slightly below 10 per 1000 in 2020 (Figure 3). White males, Hispanic females,

TABLE 1 Characteristics of patients with suicide-related diagnosis Florida State Emergency Department Database (2016–2021), aged 8–21 years.

	n = 95,667
Age (years)	
8–12	18,285 (19.1%)
13–17	34,104 (35.6%)
18–21	43,278 (45.2%)
Race/ethnicity	
White	45,001 (47.4%)
Black	24,264 (25.5%)
Hispanic	22,075 (23.2%)
Asian American/Pacific Islander	800 (0.8%)
American Indian/Alaskan Native	105 (0.1%)
Other	2766 (2.9%)
Sex	
Male	37,110 (38.8%)
Female	58,557 (61.2%)
Insurance	
Private insurance	27,427 (28.7%)
Public insurance	51,067 (53.4%)
None/other	17,173 (18.0%)
Number of suicide-related encounters per year	
1	89,352 (93.4%)
2	5082 (5.3%)
3	1233 (1.3%)
Year	
2016	16,510 (17.3%)
2017	17,259 (18.0%)
2018	17,030 (17.8%)
2019	16,674 (17.4%)
2020	12,871 (13.5%)
2021	15,323 (16.0%)

and Black males display similar rates, ranging between 5 and 7 per 1000 and Hispanic males have the lowest rates, ranging between 3 and 4 per 1000.

The percent change in suicide-related ED encounters over time is detailed in Table 2. Between 2016 and 2019, the largest percent increase (10.6%) occurred among Black females aged 18–21 years (from 11.91 to 13.17 per 1000). The second largest percent increase (7.3%) was seen among White males aged 13–17 years (from 3.38 to 3.62 per 1000). Between 2019 and 2021, the majority of the rates among subgroups decreased, although White females aged 13–17 years saw a percent increase of 11.1% (from 6.74 to 7.49 per 1000) and Black females aged 13–17 years saw a percent increase of 2.7% (from 7.86 to 8.07 per 1000).

4 | LIMITATIONS

It should be noted that there are many limitations inherent in using clinical ED data for this sort of research. There is most certainly misclassification of suicide-related versus non-suicide-related encounters, as the ICD-10 billing coding is generally at the discretion of physicians, and by its very nature, suicidal intent can be very difficult to assess. This misclassification may be correlated with race, as previous work has found that young Black patients are more likely to be classified as having an aggressive behavioral disorder than suicidal thoughts or behaviors, which is certainly a limitation.[26,27] Another important limitation is that the SEDD only includes ED encounters that do not result in admission; it is our hope that future research in this area will incorporate both SEDD and the HCUP State Inpatient Dataset in order to see whether the same trends are seen in this more acute subgroup of patients.

We chose to focus on the percent change in rates between 2016 and 2019 in order to explore trends in suicide-related ED encounters prior to COVID-19. One limitation is that we were unable to quantify trends prior to 2016; however, in September 2015, the SEDD switched from using ICD-9 coding conventions to ICD-10 coding, and the latter included new codes for suicidal behavior and major changes to self-harm codes related to intent, which makes diagnoses based on ICD-9 and ICD-10 codes difficult to compare.[28] Admittedly, the relatively steady rates of suicide-related ED visits seen in Florida during the study period across age groups, sexes, and races does beg the question of what subgroup trends may have been in place prior to 2016, and we hope that future research will address this knowledge gap. This finding is also discordant with national studies have found sharp increases in suicide-related ED encounters among young people both prior to 2016[29] and also between 2016 and 2020.[1]

It should be noted that the declines in Florida rates seen in 2020 and 2021 may not represent actual declines in rates, but may be due to COVID-19-related bias, such as misclassification of suicide-related ED encounters or patients or caregivers choosing not to seek care due to the pandemic. During the COVID-19 pandemic, hospitals in Florida faced extended periods of EDs operating at or over capacity and there were weeks at a time when emergency patients were turned away.[24] The fact that death rates by suicide for patients in these age groups remained steady or increased during the pandemic would support this argument.[6]

Additionally, the clinical data used in this work do not contain nuanced demographic data. Due to limited gender information, we are unable to speak to minoritized groups such as the LGBTQIA+ community, but this is certainly an area for future research. Limited race data mean that we are unable to speak to the heterogeneous subgroups that make up the patients classified as broadly "Hispanic," "Black," or "White." Due to the relatively small numbers of patients identifying as AAPI or AI/AN, we were unable to conduct a granular analysis of suicide-related ED visits in these subgroups, but this is an extremely important question to be explored using data with more racially diverse datasets. Finally, while the HCUP makes every effort to collect

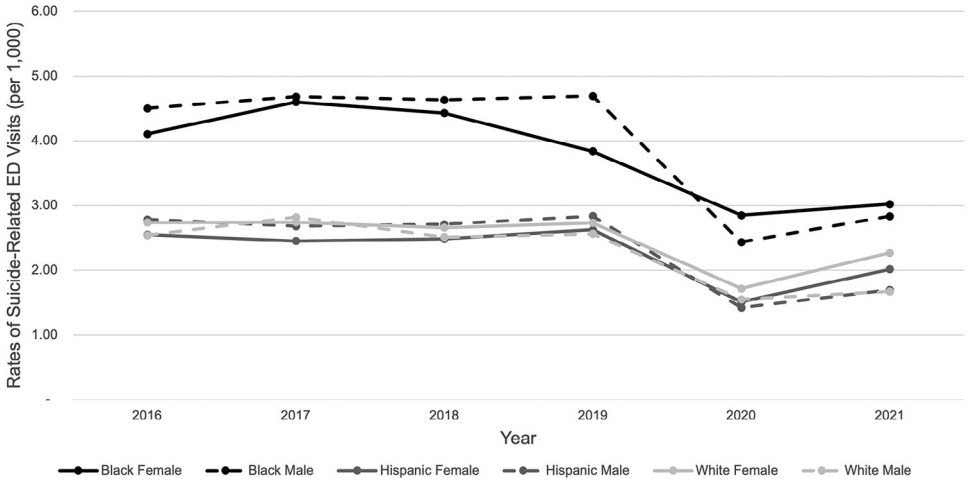

FIGURE 1 Rates of suicide-related emergency department (ED) visits per 1000 population in Florida, aged 8–12 years (2016–2021).

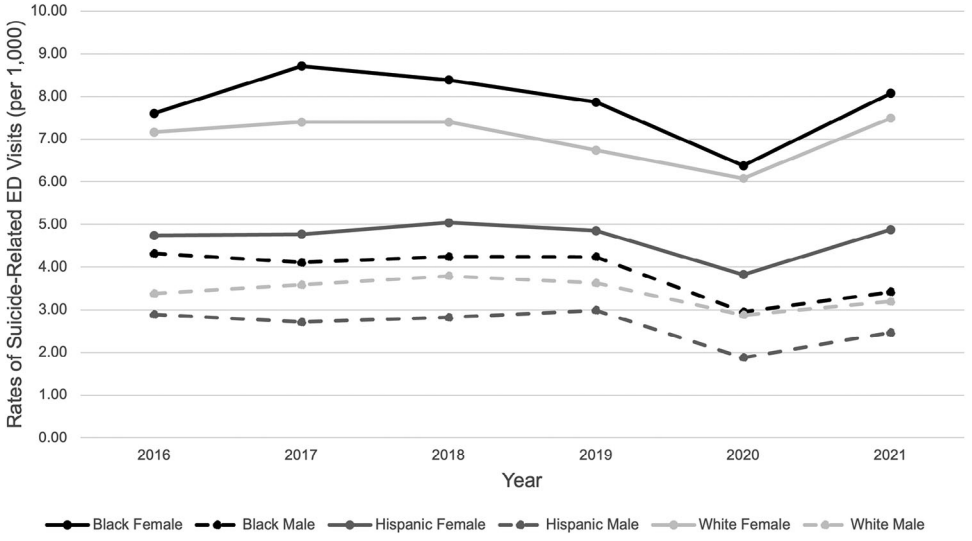

FIGURE 2 Rates of suicide-related emergency department (ED) visits per 1000 population in Florida, aged 13–17 years (2016–2021).

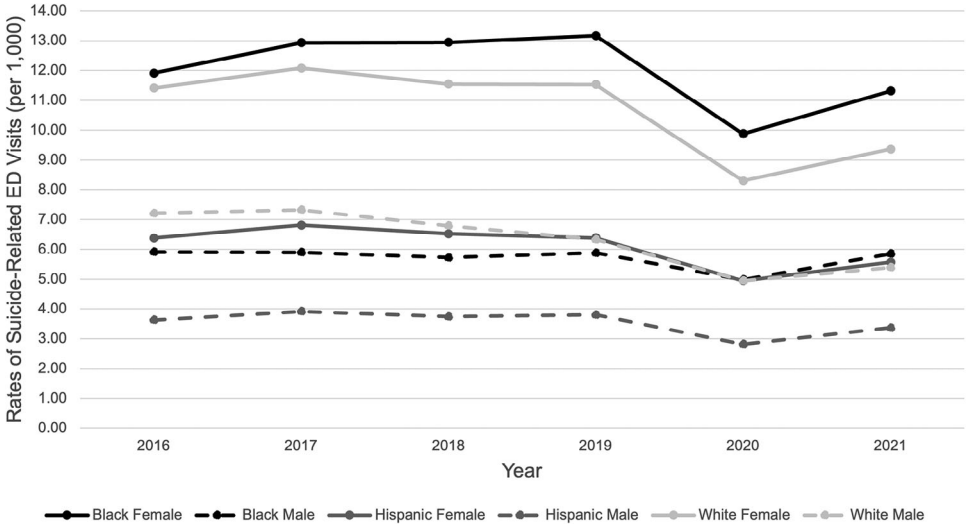

FIGURE 3 Rates of suicide-related emergency department (ED) visits per 1000 population in Florida, aged 18–21 years (2016–2021).

TABLE 2 Percent change in suicide-related emergency department encounter rates by subgroup, 2016–2019 and 2019–2021.

			Rate per 1000			Percent change	
Age group	Race	Sex	2016	2019	2021	2016–2019	2019–2021
8–12 years	White	Male	2.54	2.56	1.67	**0.9%**	–34.8%
		Female	2.74	2.73	2.27	–0.2%	–17.0%
	Black	Male	4.50	4.69	2.84	**4.3%**	–39.6%
		Female	4.11	3.84	3.02	–6.6%	–21.2%
	Hispanic	Male	2.78	2.84	1.70	**1.9%**	–40.3%
		Female	2.55	2.63	2.01	**3.0%**	–23.3%
13–17 years	White	Male	3.38	3.62	3.19	**7.3%**	–11.9%
		Female	7.16	6.74	7.49	–5.9%	**11.1%**
	Black	Male	4.32	4.24	3.42	–1.8%	–19.4%
		Female	7.60	7.86	8.07	**3.4%**	**2.7%**
	Hispanic	Male	2.89	2.99	2.46	**3.5%**	–17.5%
		Female	4.74	4.85	4.88	**2.4%**	**0.5%**
18–21 years	White	Male	7.21	6.33	5.39	–12.3%	–14.8%
		Female	11.41	11.53	9.36	**1.1%**	–18.8%
	Black	Male	5.92	5.88	5.85	–0.5%	–0.5%
		Female	11.91	13.17	11.31	**10.6%**	–14.1%
	Hispanic	Male	3.63	3.80	3.37	**4.8%**	–11.4%
		Female	6.38	6.38	5.57	0.0%	–12.7%

Note: Bold values indicate increased rate.

complete information from all ED locations in a given state, it is possible that there is incomplete reporting of ED visits, which may be a source of bias.

5 | DISCUSSION

It is notable that across all years and all three age groups, the subgroup of Black females showed consistently higher rates of suicide-related ED encounters than almost any other subgroup, supporting previous research that the Black adolescent females may be disproportionately suffering from the mental health crisis facing young people.[15,16,30–31] Among the 8–12-year-old subgroup Black male rates trended almost exactly as high as black females, and this is an important finding, as it is discordant with previous work using data from a mid-Atlantic urban pediatric ED, which found that Black preadolescent patients were less likely than peers of other races to have a suicide-related ED encounter.[26] By using an intersectional lens, we are able to unmask some dynamics that are missed when only race/ethnicity or only sex is used to classify young people; for example, the finding that 13–21-year-old Black females have the highest rates of suicide-related ED encounters across all years would most likely be masked if Black males and females were grouped together.

In this analysis, we used the Florida SEDD in combination with US census data to calculate annual population-based rates of ED encounters by age groups, race/ethnicity, and sex. Previous research focused on quantifying suicide-related ED encounters has largely utilized clinical databases including only ED encounter data; thus, the denominator for rates of ED visits has often been all *other* ED visits.[1,32] This produces a rate that is explained as an annual proportion of suicide-related ED visits. We would argue that this calculation of a rate could introduce bias, as the denominator in this case is dependent on all other ED visits, which may be impacted by numerous external race-, sex-, or age-specific confounding factors.

Overall, we hope that this work illuminates the need to disaggregate suicide rates to better understand what is driving the continued national rise despite decades of work. However, ultimately, understanding the intersectional epidemiology is only part of the solution. It is vital that sufficient funds and attention are devoted to implementing evidence-based suicide prevention programs such that children do not present to the ED with suicide-related concerns in the first place. Money should be spent on upstream prevention focused on promoting family health and positive parenting and increasing the ability of school systems to deliver prevention programming using federal grants or state-level initiatives. More direct interventions could include promoting use of the 988 hotline, ensuring the availability of local crisis response teams and broadly reducing access to lethal means. Prevention programs must be in places where racially and ethnically minoritized young people have access, such as multi-generational programs, public schools, and/or community centers. To reduce suicidality in minorized communities, multi-level interventions should broadly aim to dismantle and address the deep roots of structural racism that impact young people on a personal, interpersonal, institutional, and cultural level.[27]

AUTHOR CONTRIBUTIONS

Laura M. Prichett conceived the study. Laura M. Prichett and Claudia Paszek designed the analysis and formatted and performed the initial analysis of the data. Laura M. Prichett, Claudia Paszek, and Emily E. Haroz completed the data analysis and drafted the manuscript. All the authors contributed substantially to its revision. Laura M. Prichett takes responsibility for the paper as a whole.

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CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data used in this analysis can be obtained from the Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (https://hcup-us.ahrq.gov/tech_assist/centdist.jsp). The authors do not have the authority or permission to share the data used in this work.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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