PREVENTING CHRONIC DISEASE
PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY
Volume 23, E71 NOVEMBER 2026

ORIGINAL RESEARCH

Regional Variation in Mental Health and Well-Being Among US Adolescents Aged 12 to 17 Years, 2019–2024

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Accessible Version: www.cdc.gov/pcd/issues/2026/26_0268.htm

Suggested citation for this article: Liu Z, Shi L, Liu B. Regional Variation in Mental Health and Well-Being Among US Adolescents Aged 12 to 17 Years, 2019–2024. Prev Chronic Dis 2026;23:260268. DOI: https://doi.org/10.5888/pcd23.260268.

PEER REVIEWED

Summary

What is already known on this topic?

Geographic variation in adolescent psychosocial health has mostly been documented nationally and for a single indicator at a time. No study has examined regional variation across multiple indicators spanning mental health, adverse childhood experiences (ACEs), functional difficulties, and health care access.

What is added by this report?

This study examined 21 psychosocial health indicators across 4 domains by US Census region, from 2019 to 2024. The Midwest had the highest prevalence of frequent anxiety symptoms, frequent depression symptoms, and 6 of the 7 ACEs. The Northeast had the lowest prevalence of all 7 ACEs.

What are the implications for public health practice?

Findings suggest a need to investigate the causes of these regional disparities to support region-specific, multidimensional health interventions.

Abstract

Introduction

Adolescent psychosocial health is a critical public health priority. We aimed to examine regional and temporal trends of adolescent psychosocial health across 4 domains: mental health, adverse childhood experiences (ACEs), functional difficulties, and health care access.

Methods

This cross-sectional analysis used data on 17,394 adolescents (aged 12–17 y) from the 2019–2024 National Health Interview Survey for whom parents or guardians reported 21 psychosocial health indicators. We compared the prevalence of each indicator across 4 US Census regions (Northeast, South, Midwest, and West) and examined the temporal trend for each domain, accounting for complex survey designs and multiple testing.

Results

Across 21 indicators, national prevalence ranged from 1.3% for unmet medical needs to 18.0% for frequent anxiety symptoms. Prevalence of frequent anxiety symptoms was 14.5% in 2019, 22.8% in 2022, and 18.2% in 2024; prevalence of frequent depression symptoms was 6.6% in 2019, 9.0% in 2022, and 6.0% in 2024. Regional differences were significant for 17 of 21 indicators: prevalence of frequent anxiety symptoms ranged from 16.4% in the South to 21.2% in the Midwest. Prevalence of frequent depression symptoms ranged from 6.3% in the South to 8.8% in the Midwest, witnessed neighborhood violence from 3.5% in the Northeast to 10.6% in the Midwest, and no health insurance from 1.8% in the Northeast to 7.5% in the South.

Conclusion

We found substantial regional disparities in adolescent psychosocial health indicators across all 4 domains, particularly for mental health and ACEs. These findings suggest a need to investigate the causes of such disparities to support region-specific multidimensional health interventions.

Introduction

Adolescent mental health has emerged as a public health priority in the US. Data from January 2019 through May 2021 show increases in emergency department visits for suspected suicide attempts among adolescents, particularly during the COVID-19 pandemic (1). Studies have documented sharp increases in the prevalence of adolescent mental health symptoms at the national level during and after the COVID-19 pandemic (2–4). National Survey of Children's Health data indicate that, between 2019 and 2023, the prevalence of diagnosed mental or behavioral health condi-

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tions among adolescents increased from 16.7% to 20.3% and anxiety diagnoses rose from 12.8% to 16.1% (5).

Poor mental health outcomes during adolescence are complex and multifactorial. Factors identified as playing a role in the development of such outcomes include a genetic predisposition, family dynamics, socioeconomic conditions, school environments, and community. Consequential health and economic effects of these poor outcomes extend across the lifespan (6). Poor mental health outcomes during adolescence can also result from adverse childhood experiences (ACEs), including exposure to violence, neglect, household dysfunction, and racial discrimination (7). Together, mental health symptoms and ACEs can manifest as functional difficulties such as problems with learning, memory, concentration, social relationships, and behavioral regulation, which highlights the need for comprehensive mental health services (8). Adequate health care access plays an important role in enabling early screening as well as ongoing and effective management and treatment of mental health symptoms and serves as a critical pathway to improve the other domains of adolescent psychosocial well-being.

No prior study has examined regional variation of multiple indicators of adolescent psychosocial health across the interrelated domains of mental health, ACEs, functional difficulties, and health care access. We examined the prevalence of 21 indicators of adolescent psychosocial health across 4 US Census regions — Northeast, Midwest, South, and West — using nationally representative samples from the National Health Interview Survey (NHIS) for survey years 2019 through 2024. We also assessed whether regional variation remained stable before and after the COVID-19 pandemic. We examined adolescents aged 12 to 17 years because adolescence is the transitional phase bridging childhood and adulthood and is a critical period of rapid physical, cognitive, and psychosocial growth, and the age when many mental health conditions first appear (9). We hypothesized that significant regional disparities exist across these psychosocial health indicators and that these disparities persist over time. Understanding regional geographic patterns may help support region-specific multidimensional health interventions and enable optimization of resource allocation.

Methods

Data source

We analyzed publicly available 2019–2024 NHIS data. NHIS is a nationally representative cross-sectional survey conducted annually by the National Center for Health Statistics that collects health and health care utilization information from the US noninstitutionalized civilian population. We restricted analyses to the NHIS child sample, which randomly selects 1 child per household. For selected children, a parent or guardian provides proxy-reported health information. Response rates for the child sample during the study period ranged from 45.0% to 59.0%; sample sizes decreased from 9,193 in 2019 to 5,790 in 2020. NHIS interviews are conducted in person by US Census Bureau interviewers, although because of the COVID-19 pandemic, telephone interviews were conducted during 2020 and 2021.

The NHIS is approved by the National Center for Health Statistics Research Ethics Review Board. This study used publicly available, deidentified data and was not classified as human subject research according to the Common Rule (10).

Study population

From all participants (N = 46,760) in the 2019–2024 NHIS child samples, we excluded 28,809 participants younger than 12 years or older than 17 years and 557 participants with missing essential survey design information (sampling weight, strata, primary sampling unit, region) or a responding adult who was not a parent, caretaker, or guardian of the child, resulting in 17,394 participants aged 12 to 17 years. For the 17,394 participants in the analytic sample, missing data for each psychosocial health indicator in its available years (ACE measures 2021–2023 only) and for sociodemographic variables (age, sex, race and ethnicity, parental education) was below 2.5% and handled as complete-case in weighted estimates. Yearly sample sizes were 3,479 (2019); 2,260 (2020); 3,112 (2021); 2,677 (2022); 2,795 (2023); and 3,071 (2024). We classified participants by region of residence and used the 4 US Census regions: Northeast, Midwest, South, and West.

Psychosocial health indicators

We examined 21 indicators of adolescent psychosocial health based on parent or guardian reports, organized into 4 domains: mental health, ACEs, functional difficulties, and physical health and health care access (hereafter, health care access).

Mental health indicators included use of therapy and use of mental health medication (yes/no) during the past 12 months, as well as frequent anxiety symptoms and frequent depression symptoms. Frequent symptoms were defined as the child appearing anxious, nervous, or worried or very depressed on a daily or weekly basis and not merely monthly, a few times a year, or never.

ACEs encompassed 7 indicators (yes/no): witnessed neighborhood violence, emotional abuse (having lived with a parent or adult who frequently swore at, insulted, or put them down), unmet basic needs, parental incarceration, household mental illness, household substance use, and racial discrimination. The ACEs questions were fielded only in 2021, 2022, and 2023.

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Functional difficulties in NHIS were assessed by using the Washington Group/UNICEF Child Functioning Module, covering 5 indicators: learning things, remembering things, concentrating on activities, making friends, and controlling behavior compared with children of the same age (11). Following the Washington Group guidelines, we defined functional difficulty (yes/no) as "a lot of difficulty" or "cannot do at all," in contrast to "no difficulty or some difficulty" (11).

Health care access was assessed with 5 indicators (yes/no): fair or poor health (compared with good, very good, or excellent health); no usual source of care; no health insurance; and unmet medical needs and delayed medical care due to cost in the past 12 months.

Other measures

We examined the following sociodemographic characteristics: adolescent age (12–13 y, 14–15 y, 16–17 y), sex (male, female), race and ethnicity (Hispanic, non-Hispanic Black, non-Hispanic White, non-Hispanic Other/Multiracial), family income relative to the federal poverty level (<100%, 100%–199%, 200%–399%, ≥400%), and highest parental education level (less than high school, high school graduate, college or higher). The Other/Multiracial category includes multiracial and other races not separately categorized. Family income relative to the federal poverty level was based on NHIS-imputed income data; we used the single imputed federal poverty level values provided in the public-use files (the first of 10 implicates).

Statistical analysis

We conducted survey-weighted analyses accounting for the NHIS complex sample design (weights, strata, primary sampling units) to produce nationally representative estimates. For each measure, we calculated weighted prevalence and 95% CIs nationally and for each region. Survey variance estimation requires multiple primary sampling units per stratum; 12 strata had a single sampled unit. To address this, we applied the adjust method, which combines single-unit strata with the most similar stratum (12). We compared regional differences using Rao–Scott χ^2 tests (13). To control for multiple testing across all comparisons, we adjusted raw *P* values by using the Benjamini–Hochberg false discovery rate procedure (14). Statistical tests were 2-sided; significance was evaluated by using Benjamini–Hochberg adjusted *P* values at $\alpha < .05$. We evaluated the reliability of all weighted prevalence estimates according to the National Center for Health Statistics Data Presentation Standards for Proportions (15), which set a minimum sample size and a maximum CI width for reporting an estimate. Estimates that did not meet these standards were suppressed. We computed Korn–Graubard 95% CIs (16) for all estimates and suppressed 15 yearly regional cells that did not meet the standards.

To check for seasonal differences in the prevalence of frequent anxiety and depression symptoms, we performed a quarter-stratified sensitivity analysis pooling years 2019 through 2024. Interview quarter was available in all years; interview month was not available for 2019, so we assessed seasonality using interview quarter. Interviews were evenly distributed across quarters in every region (23.7%–26.5% per quarter). We estimated survey-weighted prevalence of frequent anxiety and depression symptoms by quarter nationally and by region (all region-quarter cells $n \geq 604$) and tested differences across quarters at the national level and within each region with Rao–Scott χ^2 global tests.

We conducted all analyses using R version 4.3.0 (R Foundation) with the *survey* and *gtsummary* packages (17,18).

Results

Sample characteristics

This study included 17,394 participants, representing approximately 25.5 million adolescents nationally: 15.5% in the Northeast, 21.0% in the Midwest, 39.3% in the South, and 24.2% in the West. The weighted mean (SD) age was 14.6 (1.7) years, and 51.1% of the participants were male. Approximately 25.6% of the participants were Hispanic, 12.7% were non-Hispanic Black, 51.9% were non-Hispanic White, and 9.8% were Other/Multiracial.

The highest proportion of Hispanic participants was in the West (41.4%), the highest proportion of non-Hispanic Black participants was in the South (20.7%), and the highest proportion of non-Hispanic White participants was in the Midwest (70.7%). Approximately 14.5% of the participants were from families with income below the federal poverty level; the highest proportion of participants from families with income below the federal poverty level was in the South (18.2%). Nationally, 26.9% of participants had a parent whose highest education was less than high school. A greater proportion of participants in the West (29.4%) and South (29.2%) had a parent whose highest education was less than high school, while participants in the Northeast had the highest proportion of college-educated parents (65.4%). The majority (80.0%) of the participants resided with married or cohabiting parents, and the proportion of participants residing with married or cohabiting parents was lowest in the South (78.1%). At the national level, 30.1% of participants resided in urban areas. The West had the highest proportion of participants living in urban areas (44.6%), followed by the Northeast (28.0%), the South (26.7%), and the Midwest (21.6%).

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Regional and national patterns in adolescent psychosocial health

The national prevalence of psychosocial health indicators ranged from 1.3% for unmet medical needs to 18.0% for frequent anxiety symptoms (Figure 1).

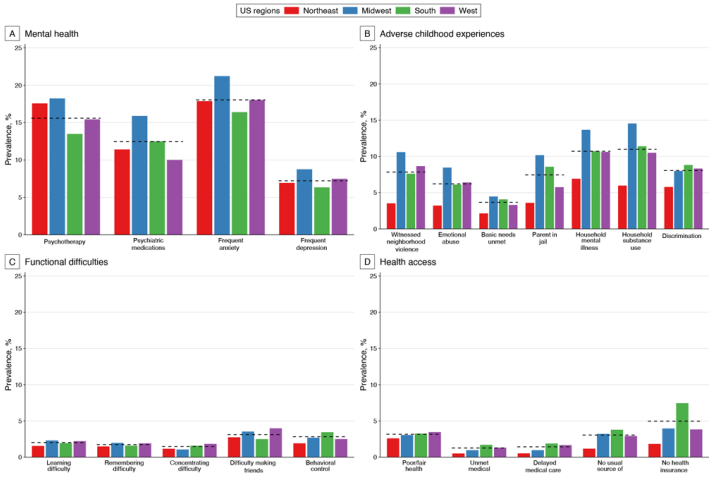


Figure 1. Pooled weighted prevalence of 21 psychosocial health indicators among US adolescents aged 12–17 years, by region, National Health Interview Survey, 2019–2024. Dashed lines show national prevalence. Significant regional differences (Rao–Scott χ^2 test, Benjamini–Hochberg–adjusted $P < .05$) were observed for psychotherapy, psychiatric medications, frequent anxiety, and frequent depression; for all adverse childhood experience indicators; for difficulty making friends and behavioral control difficulty; and for unmet medical needs, delayed medical care, no usual source of care, and no health insurance. Emotional abuse was defined as having lived with a parent or adult who frequently swore at, insulted, or put them down.

The regional prevalence across these indicators ranged from 0.5% for unmet medical needs in the Northeast to 21.2% for frequent anxiety symptoms in the Midwest. Significant regional differences (Rao–Scott χ^2 test, Benjamini–Hochberg–adjusted $P < .05$) were found for 17 of the 21 indicators (Figure 1). Prevalence of frequent anxiety symptoms ranged from 16.4% in the South to 21.2% in the Midwest, frequent depression symptoms from 6.3% in the South to 8.8% in the Midwest, and witnessed neighborhood violence from 3.5% in the Northeast to 10.6% in the Midwest. Prevalence of difficulty making friends ranged from 2.5% in the South to 4.0% in the West, and prevalence of difficulty controlling behavior ranged from 1.9% in the Northeast to 3.4% in the South. Prevalence of no health insurance ranged from 1.8% in the Northeast to 7.5% in the South.

Temporal trends in mental health

Nationally, the prevalence of frequent anxiety symptoms was 14.5% in 2019, 22.8% in 2022, and 18.2% in 2024; the prevalence of frequent depression symptoms was 6.6% in 2019, 9.0% in 2022, and 6.0% in 2024 (Figure 2). The prevalence of use of therapy/counseling was 12.3% in 2019 and 17.3% in 2024, and the prevalence of use of mental health medication was 10.8% in 2019 and 13.4% in 2024.

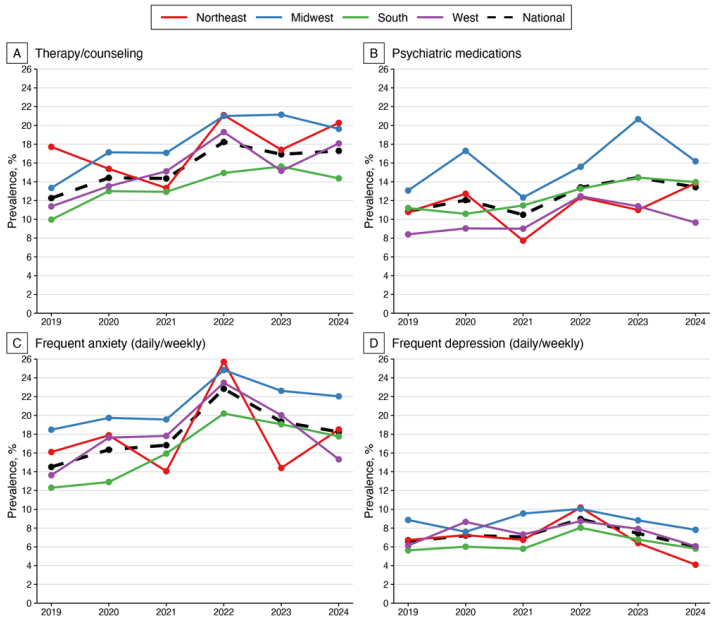


Figure 2. Annual weighted prevalence of mental health indicators among US adolescents aged 12–17 years, by region, National Health Interview Survey, 2019–2024. Dashed line shows national prevalence. 2020 Northeast data for frequent depression did not meet National Center for Health Statistics standards for proportions and should be interpreted with caution.

Regional patterns showed year-to-year variation in the prevalence of frequent anxiety and depression symptoms. In 2022, the prevalence of frequent anxiety symptoms was 25.7% in the Northeast, 24.8% in the Midwest, 20.2% in the South, and 23.5% in the West. In 2023, the prevalence of frequent anxiety symptoms was 14.4% in the Northeast, 22.6% in the Midwest, 19.1% in the South, and 20.0% in the West. In 2024, the prevalence of frequent anxiety symptoms was 18.5% in the Northeast, 22.0% in the Midwest, 17.8% in the South, and 15.3% in the West. In 2022, the prevalence of frequent depression symptoms was 10.2% in the Northeast, 10.0% in the Midwest, 8.0% in the South, and 8.7% in the West. In 2023, the prevalence of frequent depression symptoms was 6.4% in the Northeast, 8.8% in the Midwest, 6.8% in the South, and 7.9% in the West. In 2024, the prevalence of frequent depression symptoms was 4.1% in the Northeast, 7.8% in the Midwest, 5.8% in the South, and 6.1% in the West.

The national prevalence of frequent anxiety symptoms varied significantly across quarters ($P = .04$), mostly driven by modestly

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higher prevalence in the first quarter (19.6%) and fourth quarter (18.0%) than in the second quarter (17.3%) and third quarter (17.2%). Prevalence of frequent depression symptoms ranged from 6.9% in the third quarter to 7.6% in the second quarter. Within each region, the Northeast had the strongest quarterly variation: prevalence of frequent anxiety symptoms declined from 21.6% in the first quarter to 14.2% in the fourth quarter ($P = .03$), and prevalence of frequent depression symptoms fell from 8.0% in the first quarter to 3.6% in the fourth quarter ($P = .02$). Quarterly variation was not significant in the Midwest, South, or West for either outcome (all $P > .10$). The Midwest had the highest prevalence of frequent anxiety symptoms in all 4 quarters, consistent with the main analysis without quarterly comparisons.

Temporal trends in ACEs

National prevalence of ACEs indicated year-to-year variation from 2021 to 2023 (Figure 3). For witnessed neighborhood violence, national prevalence was 6.9% in 2021, 8.3% in 2022, and 8.4% in 2023; for parental incarceration, national prevalence was 6.4% in 2021, 8.4% in 2022, and 7.6% in 2023; for household mental illness, national prevalence was 10.1% in 2021, 12.1% in 2022, and 9.9% in 2023; and for household substance use, national prevalence was 9.8% in 2021, 12.8% in 2022, and 10.3% in 2023. For racial discrimination, national prevalence was 7.8% in 2021, 8.0% in 2022, and 8.4% in 2023.

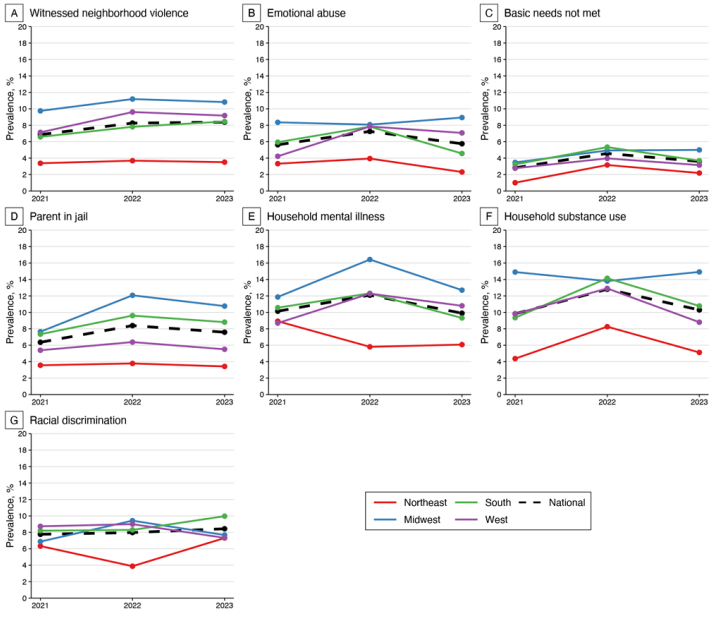


Figure 3. Annual weighted prevalence of adverse childhood experience indicators among US adolescents aged 12–17 years, by region, National Health Interview Survey, 2021–2023. Dashed line shows national prevalence. 2021 Northeast data for emotional abuse did not meet National Center for Health Statistics standards for proportions and should be interpreted with caution. Emotional abuse was defined as having lived with a parent or adult who frequently swore at, insulted, or put them down.

The Midwest had the highest prevalence across most years for most ACE indicators, including witnessed neighborhood violence (9.8% in 2021, 11.2% in 2022, and 10.8% in 2023), parental incarceration (7.6%, 12.1%, and 10.8%), and household mental illness (11.9%, 16.4%, and 12.7%) (Figure 3). The Northeast generally had the lowest prevalence of these indicators. From 2021 to 2023, yearly prevalence in the Northeast ranged from 3.4% to 3.7% for witnessed neighborhood violence, 3.4% to 3.8% for parental incarceration, and 4.4% to 8.3% for household substance use. Racial discrimination showed less consistent regional patterns; yearly prevalence ranged from 3.9% in the Northeast in 2022 to 10.0% in the South in 2023.

Temporal trends in functional difficulties

The prevalence of functional difficulties showed largely stable national trends from 2019 to 2024 (Figure 4). The prevalence of learning difficulties ranged from 1.5% in 2022 to 2.5% in 2020, the prevalence of remembering difficulties ranged from 1.5% in 2021 and 2019 to 2.0% in 2023 and 2024, and the prevalence of concentrating difficulties from 1.1% in 2019 to 1.9% in 2023 across the 6-year period. Difficulty making friends ranged from 2.7% in 2019 to 3.6% in 2020, and difficulty controlling behavior ranged from 2.2% in 2022 to 3.6% in 2024 during the same period.

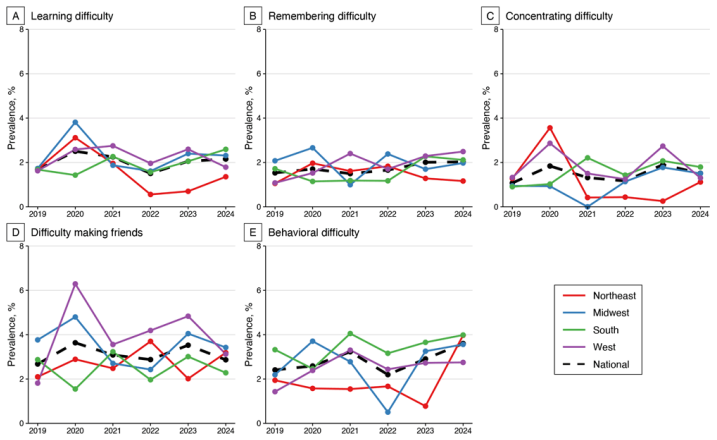


Figure 4. Annual weighted prevalence of functional difficulties among US adolescents aged 12–17 years, by region, National Health Interview Survey, 2019–2024. Dashed line shows national prevalence. Some yearly regional estimates did not meet National Center for Health Statistics reliability standards and should be interpreted with caution: 2020 Northeast data for difficulty learning, remembering, and concentrating; 2020 Midwest data for difficulty with behavioral control and making friends; and 2021 Midwest data for difficulty concentrating.

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Regional patterns revealed year-to-year fluctuations in prevalence across all 4 regions (Figure 4). In the Northeast, the prevalence of learning difficulties was 0.6% in 2022, 0.7% in 2023, and 1.4% in 2024, and the prevalence of concentrating difficulties was 0.4% in 2021, 0.4% in 2022, 0.3% in 2023, and 1.1% in 2024. The prevalence of behavioral control difficulties in the Northeast was 0.8% in 2023 and 4.0% in 2024. In the West, the prevalence of having difficulty making friends was 6.3% in 2020 and 3.1% in 2024. In the South, the prevalence of behavioral control difficulties ranged from 2.5% in 2020 to 4.1% in 2021.

Temporal trends in health care access

At the national level, the prevalence of unmet medical needs was 1.2% in 2019, 1.1% in 2022, and 1.7% in 2024, while the prevalence of delayed care due to cost was 1.7% in 2019, 1.1% in 2022, and 2.1% in 2024; both measures reached their lowest values between 2020 and 2022, likely reflecting pandemic-related health care disruptions (Figure 5). The prevalence of no health insurance was 5.7% in 2019, 4.3% in 2023, and 5.2% in 2024.

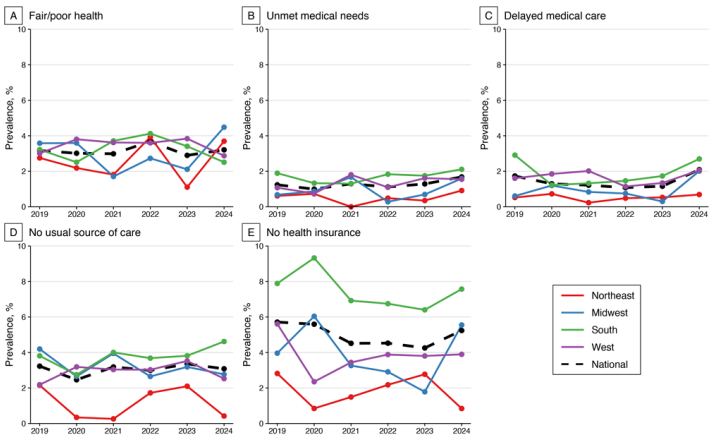


Figure 5. Annual weighted prevalence of physical health and health care access among US adolescents aged 12–17 years, by region, National Health Interview Survey, 2019–2024. Dashed line shows national prevalence. Some data did not meet National Center for Health Statistics standards for proportions and should be interpreted with caution: 2022 and 2024 Northeast data on fair/poor health; 2021 Northeast data on unmet medical needs; and Northeast 2019, 2022, 2023 and Midwest 2020 data on no health insurance.

Regional patterns in health care access also showed year-to-year fluctuation (Figure 5). Prevalence of no health insurance in the South ranged from 6.4% in 2023 to 9.3% in 2020, and prevalence of delayed care in the Midwest ranged from 0.3% in 2023 to 2.0% in 2024.

Discussion

Using a nationally representative sample of US adolescents aged 12 to 17 years, we examined national and regional prevalence of 21 indicators of psychosocial health across 4 domains — mental health, ACEs, functional difficulties, and health care access. We also compared the changes in the regional prevalences from 2019 through 2024. Our analysis revealed distinct geographic disparities that may have been masked by the national-only results.

We found that the Midwest had the highest prevalence of mental health and ACEs measures, while the South had the highest prevalence of lack of health care access and of behavioral control difficulties. In contrast, the Northeast generally had the lowest prevalence of ACEs and health care barriers. Participants from the West stood out for friendship difficulties. These regional differences may be partially explained by the sociodemographic patterns observed. For example, the Midwest had the highest proportion of participants living in rural areas (50.1%), where greater geographic isolation may increase the risk of social isolation and mental health problems. Compared with urban children, rural children are more likely to be exposed to ACEs such as parental incarceration, household mental illness, and household substance use (19), all of which we examined in this study. The South had the highest proportion of participants living below the federal poverty level (18.2%), which may contribute to greater barriers in health care access. These regional disparities remained stable from 2019 to 2024, indicating that regional disparities persisted despite major societal disruptions caused by the COVID-19 pandemic. The co-occurrence of elevated prevalence of mental health symptoms, learning difficulties, and ACEs in the Midwest suggests that Midwestern adolescents may face compounded challenges. These compounded challenges could have adverse consequences; these problems during adolescence could affect educational success, workforce readiness, and physical health outcomes in later life. The low prevalence of health care access in the South needs attention, because clinical intervention may help address behavioral and mental health needs before they manifest as chronic functional impairments.

The national prevalence of frequent anxiety symptoms varied by season, with relatively higher prevalence in the first quarter and fourth quarter. This finding is partly consistent with a prior report of higher rates of anxiety among adolescents in autumn, at the start of the school year (20). Our temporal analysis showed a 2022 peak in the prevalence of frequent anxiety and depression symptoms, likely related to conditions during the middle and later stages of the pandemic. The prevalence of frequent anxiety and depression symptoms during the earlier stage of the pandemic is consistent with prior reports of worsening adolescent mental health during the COVID-19 pandemic (2,21). A recent study re-

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ported a sustained increase in adolescent mental health problems through late 2022 (22); our analysis adds data from the subsequent 2 years. The year-to-year changes in the prevalence of frequent anxiety and depression symptoms in our study may reflect the short-term environmental and social changes during the pandemic, such as school closures or social isolation (23). With the pandemic ending in 2023, this prevalence may have stabilized; however, the most recent estimates remain above our study's 2019 estimate (eg, frequent anxiety symptoms: 18.2% in 2024 vs 14.5% in 2019), which warrants continued investigation. In our study, use of therapy was 12.3% in 2019 and 17.3% in 2024, and use of mental health medication was 10.8% in 2019 and 13.4% in 2024. This use may reflect a response to the higher prevalence of frequent anxiety and depression symptoms during the pandemic (2–4). The prevalence of functional difficulties and health care access was relatively unchanged. These distinct temporal patterns suggest that while the prevalence of frequent anxiety and depression symptoms fluctuated during the pandemic, the steady prevalence of functional difficulties and lack of health care access may reflect longer-term problems.

Strengths and limitations

This study has several strengths. Our findings of regional patterns in 21 adolescent psychosocial health indicators across 4 domains extend prior research of national prevalence of single or limited domains (24,25). The nationally representative sample and robust survey methodology provided reliable estimates of regional patterns. The examination of multiple domains offered a holistic view of adolescent psychosocial well-being. Furthermore, the yearly estimates show how these measures changed during and after the COVID-19 pandemic.

Our study has several limitations. First, the publicly available data allowed us to examine regional geographic differences only. If available, examination of these psychosocial measures at the state, county, and neighborhood level would provide more localized insights. Second, the 21 indicators were based on parental or guardian reports rather than adolescent self-reports and therefore likely reflect parental or guardian awareness of adolescents' experiences rather than true prevalence. This introduces proxy reporting bias, particularly for sensitive ACE-related experiences; in the NHIS–Teen study, which compared parents' or guardians' reports in the main NHIS interview with adolescents' self-reports in the companion NHIS–Teen survey of the same population, parent–teen agreement on ACEs was only fair to moderate, and parents were less likely than teens to report that an ACE had occurred (26). Accordingly, our ACE-related estimates should be interpreted cautiously, and future work using adolescent self-report is needed to validate these findings. Comparison with self-report surveys of adolescents, such as the Youth Risk Behavior Survey (YRBS), which collects data directly from high-school students, would further contextualize our parent-reported estimates. For context, in the nationally representative 2023 YRBS, 39.7% reported persistent feelings of sadness or hopelessness, and 28.5% reported poor mental health (27) — substantially higher than our parent-reported estimates (eg, frequent depression symptoms 6.0%–9.0% nationally from 2019–2024), underscoring that parental reports likely understate adolescents' subjective distress. Third, ACEs data were available only from 2021 onward, limiting our ability to assess prepandemic patterns in ACE data or longer-term trends. Fourth, the comparisons of the temporal trends across the 4 regions were descriptive. With a longer follow-up period and refined geographic level, in-depth statistical testing of the spatiotemporal distribution of the psychosocial health measures is recommended. Fifth, the quarter-stratified sensitivity analysis addressed interview timing but was limited to 2 symptom outcomes; the other indicators could not be examined by quarter because the corresponding quarterly estimates were not available for all years.

Conclusion

We found substantial regional variation in adolescent psychosocial health across US regions. The Midwest consistently had the highest prevalence of frequent mental health symptoms and ACEs, while the Northeast had the lowest prevalence of ACEs. National policies alone may not be sufficient without considering regional contexts and tailoring implementation strategies to regional conditions. In addition, the interconnected nature of these 4 domains suggests a critical need to investigate the underlying causes of such regional disparities in support of region-specific multidimensional health interventions and resource allocation.

Acknowledgments

We appreciate Scott Savaiano, PhD, The Bronx High School of Science, for discussion and insights. The authors declare no potential conflicts of interest with respect to the research, authorship, or publication of this article. The authors received no external financial support for the research, authorship, or publication of this article. No copyrighted material, surveys, instruments, or tools were used in the research described in this article. This study analyzed publicly available data from the 2019–2024 National Health Interview Survey (https://www.cdc.gov/nchs/nhis/index.htm). Additional tables and figures are available from the corresponding author on request.

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