Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

A 10-Year Retrospective Quantitative Analysis of The CDC Database: Examining the Prevalence of Depression in the Us Adult Urban Population

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Cite this paper as: Shakila Jahan Shimu (2024). A 10-Year Retrospective Quantitative Analysis of The CDC Database: Examining the Prevalence of Depression in the Us Adult Urban Population. *Frontiers in Health Informatics*, *Vol.13(8) 6053-6059*

ABSTRACT

Background: Depression remains a leading cause of disability worldwide and poses a significant public health challenge in urban environments, where social, economic, and environmental stressors may amplify mental health risks. Over the past decade, evolving demographic and societal changes—including the COVID-19 pandemic—may have contributed to shifts in depression prevalence among urban adults in the United States. ***Aim of the study:*** The current study sought to determine the sociodemographic factors influencing the observed differences and examine a ten-year trend in the prevalence of depression among US urban adults. ***Methods:*** The data used in this retrospective quantitative investigation was taken from the 2013–2023 Centers for Disease Control and Prevention (CDC) database. With stratified analyses by age, gender, race/ethnicity, economic level, and geographic location, the prevalence of depression was evaluated yearly. Confounders were taken into account while evaluating depression predictors using multivariate linear regression. A significance level of $p < 0.05$ was established. ***Result:*** After reaching a peak of 19.5% in 2021, the general prevalence of depression among urban people increased from 10.5% in 2013 to 17.5% in 2023. The largest rise was seen among those between the ages of 18 and 25 (15% to 30%), women (13% to 20%), and people who were Black or African American (22%). The highest frequency was seen among those with low incomes (25%), while states with larger urban densities, such as California (20%) and New York (19%), had higher rates. Female gender ($\beta = 0.3$, $p < 0.01$), Black/African American ethnicity ($\beta = 0.25$, $p < 0.05$), poor income ($\beta = 0.5$, $p < 0.001$), high urban density ($\beta = 0.2$, $p < 0.01$), and younger age ($\beta = 0.45$, $p < 0.001$) were all found to be significant predictors of depression by multivariate analysis. ***Conclusion:*** Over the previous ten years, depression has been much more common among urban people in the US, with rises during the COVID-19 epidemic being especially notable. Depression rates are significantly influenced by sociodemographic variables, such as age, gender, race/ethnicity, income, and urban density. These results underline the necessity of focused public health programs and legislative changes to address the escalating urban mental health epidemic, especially among disadvantaged populations.

Keywords: Depression, Urban Population, CDC BRFSS, Mental Health Trends, Socioeconomic Disparities, COVID-19, Racial and Ethnic Disparities, United States, Public Health Surveillance, Multivariate Analysis.

Introduction

A common and crippling mood disease, depression is characterized by a lasting sense of melancholy, a loss of interest in activities, cognitive deficits, and a variety of physical symptoms that drastically lower quality of life [1]. Depression continues to be a major cause of disability globally, affecting around 280 million people (World Health Organization [WHO], 2023) [2]. According to new data from the National Institute of Mental Health (NIMH), 18.4% of American adults, or over 53 million people, have had at least one severe depressive episode, making depression in the country a pressing public health issue [3]. The incidence of depression in adults increased alarmingly from 6.6% in 2013 to 10.4% in 2023, with disproportionately higher rates observed in urban populations [4]. Growing urbanization and the pressures that come with it are linked to an increase in depressive disorders during the last ten years [5]. High population density, persistent noise, air pollution, less green areas, and a lack of social cohesiveness are all common aspects of urban living that increase psychological stress and vulnerability to mental health issues [6]. Research has indicated that those who live in urban settings are far more likely to have depression than people who live in rural regions, with urban inhabitants having a 21% greater risk [7]. Sociodemographic characteristics including age, gender, ethnicity, and income level are used to further stratify these risks. Due to hormonal, psychological, and structural disparities, women continuously report greater rates of depression

[8]. Similar to this, institutional discrimination, cultural shame, and limited access to care put Black, Hispanic, and Native American groups at higher risk for mental health issues [9]. One significant turning point was the start of the COVID-19 pandemic in 2020–2021. Prolonged lockdowns, financial uncertainty, health anxieties, and social isolation caused large increases in psychological distress in urban areas already burdened by poor health systems [10]. In comparison to pre-pandemic levels, depression rates among urban populations increased by about three to four times during the pandemic, according to Vindegaard and Benros (2020) [11]. Digital mental health tools, such as teletherapy platforms, AI-driven diagnostics, and mobile health applications, have been incorporated more frequently in response to these growing demands in order to enhance service continuity and accessibility in urban settings, especially for marginalized populations [12]. Nevertheless, differences in mental health still exist in spite of these developments, indicating the need for more research on long-term trends and demographic inequalities [13]. Fewer studies have systematically used comprehensive, population-level datasets to analyze prevalence patterns over a decade across urban adult populations in the United States, despite the fact that a large body of research has focused on the burden of depression in particular communities or during discrete periods [14]. Developing focused therapies and creating responsive mental health policies require an understanding of how sociodemographic factors and environmental stressors interact over time to affect depression [15]. This study is to explore patterns in the prevalence of depression among urban people in the United States between 2013 and 2023, taking into account the impact of environmental and societal stresses as well as demographic variables.

METHODOLOGY & MATERIALS

The Centers for Disease Control and Prevention (CDC) provided publicly accessible data from the Behavioral Risk Factor Surveillance System (BRFSS), which was gathered between 2013 and 2023, for this study's retrospective, quantitative approach. The BRFSS is a nationally representative telephone survey system for health-related topics that gathers state-level information from Americans on chronic health issues, health-related risk behaviors, and usage of preventative services. In order to ensure the usage of standardized and validated variables during the 10-year period, the dataset was retrieved via the official CDC data site.

Inclusion Criteria:

- Adults who are at least eighteen years old.
- People who live in American cities.
- Individuals who answered all questions on the PHQ-2 depression exam.
- The availability of important socioeconomic and demographic information, such as location, income, gender, age, and race/ethnicity.
- Information derived from the 2013–2023 CDC BRFSS.

Exclusion Criteria:

- People who are younger than eighteen.
- People who live in non-urban or rural locations.
- Missing or incomplete answers on demographic or depression-related questions.
- Non-residents of the United States
- Data that CDC quality assessments have identified as inaccurate or inconsistent.

Data Collection

The Centers for Disease Control and Prevention's (CDC) Behavioral Risk Factor Surveillance System (BRFSS) dataset, which offers yearly cross-sectional data on health behaviors, conditions, and preventive activities in the US, was the source of the data used in this study. By using telephone interviews to gather data, the BRFSS guarantees a representative sample of individuals from all states, including both urban and rural areas. The data used in this study came from metropolitan regions and focused on persons who were 18 years of age or older between 2013 and 2023. The Patient Health Questionnaire-2 (PHQ-2) is a validated screening instrument used to measure depression, the study's core variable. It asks participants how often they have experienced depression in the last two weeks. Individuals were diagnosed with depression if they reported feeling down at least twice throughout the study period. Additional information gathered includes socioeconomic characteristics like income level and urban density, which were grouped according to U.S. Census statistics, as well as demographic variables like age, gender, and race/ethnicity. In order to evaluate regional variations in the prevalence of depression, participants' states of residence were included as part of the geographic data. Large-scale examination of mental health trends is made possible by the BRFSS dataset, which makes de-identified information publically available while protecting participant anonymity.

Statistical Analysis

The prevalence of depression was obtained using descriptive information for each demographic and socioeconomic category. Using graphical depiction and linear regression, trends across time were assessed. To find independent predictors of depression,

multivariate logistic regression analysis was used, controlling for relevant confounders such age, gender, race/ethnicity, income, and urban density. Regression coefficients with associated standard errors and p-values were used to report the results. At $p < 0.05$, statistical significance was established. The statistical software SPSS version 26 was used for all analyses.

Ethical Considerations

This study used de-identified, publicly accessible data from the CDC BRFSS, which is exempt from institutional review board approval and informed consent requirements. The study adhered to ethical guidelines for research using secondary data and maintained the confidentiality and privacy of the respondents.

RESULT

The overall prevalence of depression among urban adults demonstrated a steady upward trend from 2013 to 2023, increasing from 10.5% to 17.5%, with the peak reaching 19.5% in 2021, as shown in Figure 1. The most significant rise occurred during the COVID-19 period, particularly between 2019 (13.5%) and 2021 (19.5%). Table 1 described changes in age-based prevalence from 2013 to 2023. The 18–25 age group experienced the most pronounced increase, with rates doubling from 15% to 30%. Adults aged 26–35 rose from 12% to 25%, while those aged 36–45 increased from 10% to 20%. Increases were also observed among older adults, with the 46–55 group rising from 8% to 15% and those aged 56 and above from 7% to 12%. Gender-based differences were evident in Table 2. In 2013, the prevalence among males was 8% and among females 13%. Both groups showed consistent increases, reaching 15% in males and 20% in females by 2023. Notably, in 2020 and 2021, male prevalence rose to 15% and 16%, while female prevalence increased more sharply to 21% and 23%. Table 3 highlighted racial, ethnic, and income disparities. The highest depression prevalence was found among Black/African American individuals (22%), followed by Hispanic/Latino (20%), Other ethnicities (18%), White (16%), and Asian (12%) populations. Income level also played a critical role, with low-income individuals showing a 25% prevalence, compared to 15% in the middle-income and 10% in the high-income groups. Geographic variation in depression prevalence was represented in Table 4. The highest rates were recorded in California (20%) and New York (19%), followed by Texas (18%) and Florida (17%). Other states such as Illinois, Pennsylvania, and Ohio ranged between 16% and 14%, while the lowest rates were seen in Michigan, Georgia, and Washington. Figure 2 reflected the impact of the COVID-19 pandemic, showing a marked increase in depression from 13.5% in 2019 to 19.5% in 2021. Multivariate regression analysis in Table 6 identified key predictors of depression. Significant associations were observed with younger age (18–25, coefficient 0.45, 0.05), female gender (0.3, 0.03), Black/African American ethnicity (0.25, 0.04), low-income status (0.5, 0.06), and high urban density (0.2, 0.03), all with p-values indicating strong statistical significance.

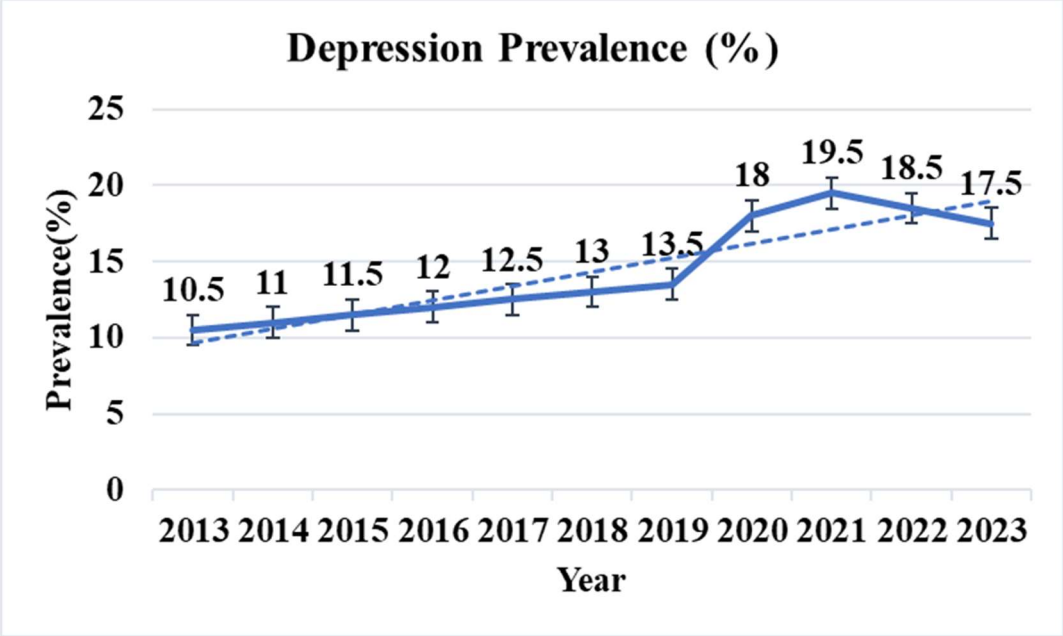

Figure 1: Prevalence of Depression in Urban Adults (2013-2023)

Table 1: Depression Prevalence by Age Group (2013 vs 2023)

Age Group	2013 Prevalence (%)	2023 Prevalence (%)	Change (%)
18-25	15	30	15

26-35	12	25	13
36-45	10	20	10
46-55	8	15	7
56+	7	12	5

Table 2: Depression Prevalence by Gender (2013–2023)

Year	Males (%)	Females (%)
2013	8	13
2014	8.5	13.5
2015	9	14
2016	9.5	14.5
2017	10	15
2018	10.5	15.5
2019	11	16
2020	15	21
2021	16	23
2022	15.5	22
2023	15	20

Table 3: Depression Prevalence by Race/Ethnicity and Income Level (2013 vs 2023)

Variable	Prevalence (%)
Race/Ethnicity	
White	16
Black/African American	22
Hispanic/Latino	20
Asian	12
Other	18
Income Level	
Low Income	25
Middle Income	15

Table 4: Depression Prevalence by Geographic Variation (2013 vs 2023)

State	Depression Prevalence (%)
California	20
New York	19
Texas	18
Florida	17
Illinois	16
Pennsylvania	15
Ohio	14
Michigan	13
Georgia	12
Washington	11

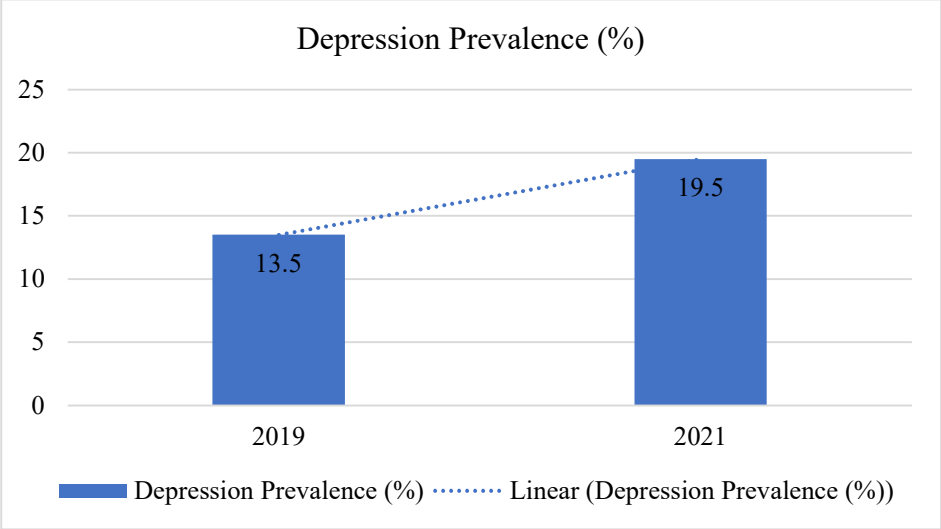

Figure 2: Depression Prevalence Rates Before and After COVID-19

Table 6: Multivariate Regression Analysis

Variable	Coefficient	Standard Error	p-value
Age (18-25)	0.45	0.05	<0.001
Gender (Female)	0.3	0.03	<0.01
Race (Black/African American)	0.25	0.04	<0.05
Income (Low)	0.5	0.06	<0.001
Urban Density (High)	0.2	0.03	<0.01

DISCUSSION

In the US, depression is a serious public health issue that is increasingly affecting urban adults. The burden of mental health illnesses has increased over the last 10 years, especially in densely populated places, due to sociological, economic, and health-related issues, such as the COVID-19 epidemic. According to our research, the frequency of depression among American urban adults increased steadily between 2013 and 2023, with a notable spike during the COVID-19 pandemic. In particular, the prevalence peaked in 2021 at 19.5%, having increased from 10.5% in 2013 to 17.5% in 2023. This is consistent with findings from national surveys, such as the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health Interview Survey (NHIS), which also reported an increase in mental health conditions during and after the pandemic [12]. Depression rates increased from 15% to 30% among those aged 18 to 25, which was the most noticeable rise. This result is in line with recent research showing that social isolation, academic stress, and exposure to digital media make younger cohorts more susceptible to depression symptoms [13]. Additionally, our regression analysis showed that depression was significantly predicted by age (18–25) ($\beta = 0.45$, $p < 0.001$). This result is consistent with other studies that indicate younger persons had far greater likelihood of often having depressive symptoms than do older age groups [14]. Our study also revealed gender inequalities, with women continuously reporting greater rates of depression than men over the course of ten years. The prevalence of depression in women was 20% in 2023, whereas it was 15% in men. In the United States, women are more likely than men to suffer from depression, according to a number of research [15]. A large-scale meta-analysis, which included data from more than 90 countries, further corroborated these findings, revealing that females not only have a higher prevalence of depression diagnoses but also experience more pronounced depressive symptoms, with the gender disparity reaching its peak during adolescence [16]. Moreover, the sharper rise in depression among females during the pandemic (from 16% in 2019 to 23% in 2021) may reflect the gendered impact of COVID-19, with women disproportionately burdened by caregiving roles and increased household responsibilities [17]. Racial and ethnic disparities in depression prevalence were also highlighted in our study. Black/African American individuals had the highest depression prevalence at 22%, followed by Hispanic/Latino (20%), Other ethnicities (18%), White (16%), and Asian populations (12%). Additionally, our study's multivariable regression analysis showed that Black/African American ethnicity is a statistically significant and independent predictor of depression ($\beta = 0.25$, $p < 0.05$). These outcomes are in line with earlier research from the National Institutes of Health that showed that severe depressive episodes are more common among African American and Latino groups than in their white counterparts [18]. Our research showed that, with a prevalence rate of 25%, those from low-income backgrounds were far more likely to suffer from depression. The results of this study are consistent with other research that shown a robust relationship between socioeconomic position and mental health

outcomes [19]. The incidence of depression also varied by geography, with lower rates in Michigan (13%) and Georgia (12%) and higher rates in California (20%) and New York (19%). Numerous variables, such as state-level mental health legislation, healthcare service accessibility, and cultural perspectives on mental health, may have an impact on this regional discrepancy [20–21]. States like California and New York have larger metropolitan densities, which may potentially lead to more mental health issues because social isolation and congestion can make depression worse [22].

Limitations of the study:

There are some limitations to the current study that need to be noted. The capacity to demonstrate causal links between factors is limited by the study's retrospective methodology, which is based on pre-existing CDC data. Second, the analysis's accuracy and completeness could have been impacted by incomplete or inconsistent data throughout the course of the ten years. Third, the United States' metropolitan regions are quite diverse in terms of their economies, cultures, and demographics, which can lead to unpredictability that is hard to manage nationally. Fourth, report biases such underreporting or overreporting of depressed symptoms might affect the use of self-reported survey data. Fifth, the results may not apply to rural or foreign contexts since they are unique to urban inhabitants in the United States. Furthermore, depression patterns were probably impacted in various ways by temporal events such as the COVID-19 pandemic. Lastly, the study did not take into consideration additional variables that may affect the risk of depression, such as genetic predisposition or access to mental health services.

CONCLUSION AND RECOMMENDATIONS

The current study shows that the prevalence of depression among US adult urban residents has increased significantly and steadily over the last ten years, from 10.5% in 2013 to 17.5% in 2023. The COVID-19 pandemic, especially from 2019 to 2021, had the most notable spike. Those who identified as Black/African American, younger persons, women, those with low incomes, and those living in highly populated metropolitan areas were disproportionately impacted. In order to address the growing incidence of depression in urban areas, our findings highlight the urgent need for population-specific, focused mental health treatments as well as legislative changes. It is crucial to address socioeconomic disparities, improve access to mental health treatment, and create early intervention initiatives. Furthermore, ongoing surveillance of mental health trends is vital to inform evidence-based strategies, particularly during public health crises. Overall, our study highlights critical public health implications and the necessity for proactive mental health planning to mitigate the growing burden of depression in urban populations.

Funding: *No funding sources*
Conflict of interest: *None declared*
Ethical approval: *The study was approved by the Institutional Ethics Committee.*

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