

# COVID-19 and Mental Health: Longitudinal Data Analysis (2020-2024)

## I. Introduction

The COVID-19 pandemic has a lasting impact, not only on physical health and economic stability, but also mental health across the United States. To monitor these changes, the U.S. Census Bureau launched the Household Pulse Survey, which collected data on symptoms indicating depression or anxiety from April 2020 through September 2024. This dataset provides an opportunity to track how mental health outcomes fluctuated across time, demographics, and geography. This project analyzes patterns of depression and anxiety symptoms using a combination of Python and Tableau. This project shows how survey data can be transformed into accessible, interactive dashboards that highlight key patterns and track trends over time.

## II. Data Preparation

To begin the analysis, I imported the survey dataset containing over 16,000 records on symptoms indicating depression or anxiety. I cleaned and organized the data and standardized the date format. From there, I separated the data into three main groups: one focusing on depression symptoms, one on anxiety symptoms and one that combined both. After dropping the incomplete entries, each dataset contained about 5,000 entries. Finally, I prepared the cleaned datasets and exported them for visualization in Tableau.

## III. Tableau Visualizations and Analysis

### 1) National Trend of Depressive Symptoms (2020-2024)

- a) The national trend analysis revealed that depressive symptoms peaked near 43% during mid-2020 and again in 2021. These peaks coincided with major events such as the initial vaccine rollout and the Delta variant surge. Rates declined following the end of lockdowns, eventually stabilizing around 20%.

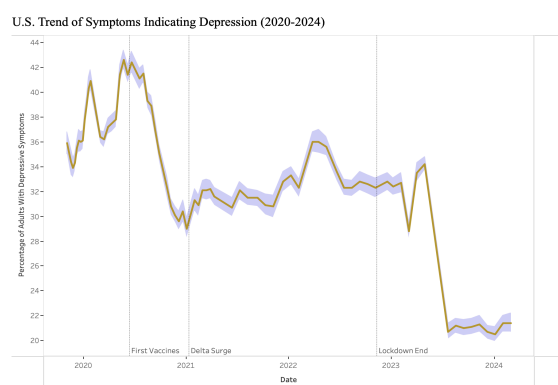


Figure 1.

## 2) Trends Amongst Various Demographics

- a) When comparing results across demographic groups, clear disparities emerged. Young adults between the ages of 18 and 29 consistently reported the highest prevalence of depressive symptoms compared to older age groups. By contrast, individuals who identified as Asian only and non-Hispanic generally reported lower rates than other racial and ethnic groups. Gender differences were also evident, with women reporting higher prevalence than men across nearly all phases of the survey.
- b) [https://public.tableau.com/views/DepressionIndicatorsforVariousDemographics/InteractiveDemographicDashboard?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/DepressionIndicatorsforVariousDemographics/InteractiveDemographicDashboard?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)

## 3) Geographic Variation with Time Slider

- a) The geographic analysis was visualized through a choropleth map with a monthly time slider, allowing changes in prevalence to be tracked across states. Patterns revealed that Southern states tended to report higher rates of depressive symptoms, while states in the Midwest consistently showed lower prevalence compared to other regions.
- b) [https://public.tableau.com/views/StatelevelPrevalenceofSymptomsAcrossTime/StateLevelPrevalance?:language=en-US&publish=yes&:sid=&:redirect=auth&:display\\_count=n&:origin=viz\\_share\\_link](https://public.tableau.com/views/StatelevelPrevalenceofSymptomsAcrossTime/StateLevelPrevalance?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link)

## IV. Key Insights

The analysis revealed the symptoms of depression were most prevalent early in the pandemic and again during the Delta variant surge. Certain groups, including young adults, women, and racial and ethnic minorities, consistently reported higher rates of mental health symptoms compared to other populations. In addition, the results showed disparities amongst states with certain regions experiencing a more severe impact than others. These findings emphasize the need for targeted, localized mental health interventions that account for both demographic and regional differences.