

# Mental Health Care in the Last 4 WEEKS

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**Abstract—** This study investigates the repercussions of the COVID-19 pandemic on individuals' mental health, utilizing a dataset gathered in successive four-week intervals spanning from August 19, 2020, to May 9, 2022. Employing a thorough methodology, literature review, and statistical analysis, the research seeks to provide significant insights into the assessment of the pandemic's effects on employment status, consumer spending, food security, housing, educational disruptions, and various aspects of physical and mental well-being. The findings aim to contribute valuable perspectives for understanding the multifaceted impact of the pandemic across these dimensions.

## I. INTRODUCTION

The COVID-19 pandemic has had a significant impact on the mental health of people worldwide. To monitor this impact, the National Center for Health Statistics (NCHS) and the Census Bureau launched the Household Pulse Survey, an online survey that collects weekly data on various social and economic indicators. This paper aims to analyze the data from the Household Pulse Survey on the receipt and unmet need of mental health care among adults in the United States during the pandemic. We compare the estimates from the Household Pulse Survey with those from the National Health Interview Survey (NHIS), a benchmark survey that measures mental health care in the past year. We also examine the factors that may influence mental health care utilization and access, such as age, sex, race and ethnicity, education, income, and geographic location. Our findings have important implications for policymakers, healthcare providers, and researchers.

## II. OBJECTIVE

This paper seeks to answer three research questions:

- Question 1: How does the level of education influence the access, utilization, and outcomes of mental health care services during the final 4 weeks of the COVID-19 pandemic?
- Question 2: How do differences in geographical locations across states influence the accessibility to prescription medicines and therapy as essential components of mental health care during the COVID19 pandemic?"
- Question 3: How did the COVID-19 pandemic impact the mental health of individuals aged 18-80,

considering age differences, and socioeconomic status.

## III. LITERATURE SURVEY

This literature review examines three crucial studies: [1]"Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study" The level of education is an important determinant of access, optimal utilization, and experiencing the outcomes of mental health care services. As the COVID-19 pandemic concluded, it is crucial to understand the role of education in shaping these factors, as they play a significant role in aiding the population to make informed medical decisions. In a survey conducted by Texas AM University, most of the students reported increased stress and anxiety. Despite the increased need for the utilization of mental health services, only a small portion of Students seemed to have utilized the available services from their institution's counseling centers. More educated individuals have better access to information and a better understanding of mental health, however, individuals with lower levels of education have trouble with access, impacting their decision-making process. In this analysis, the various levels of education have been highlighted in terms of each group's ability to make decisions while choosing between prescription medicines and mental health counseling. [2]"Transforming Mental Health Care in the United States" Around the time of the COVID-19 pandemic, The U.S. mental health system found an opportunity for a transformative overhaul to address major challenges. These challenges were addressed by the inclusion of Medicaid expansion, mental health parity laws, evidence-based treatments. Medicaid Expansion under the Affordable Care Act expanded, bringing mental health care under their umbrella, even for low-income individuals. In some states, they have re-enforced robust mental health parity laws. Variations in state laws related to drug monitoring programs and Regulations can influence the availability of prescription medications for mental health conditions. Stringent regulations may pose obstacles to obtaining essential medications. This analysis highlighted the differences in how various

geographical locations, based on their policies, had different accessibility to mental health services. [3]”The Implications of COVID-19 for Mental Health and Substance Use” Research on the mental health consequences of the pandemic has revealed surprising trends related to age. Young adults have reported higher levels of depression, anxiety, and suicidal thoughts as compared to older adults, making them susceptible to substance abuse, increased loneliness and job instability. Older adults, however, have effective coping strategies to navigate through these changes. These variations in perspective lead to differences in how younger and older adults perceive mental health, influencing their distinct decisions related to mental well-being. Even though they face a greater risk of severe COVID-19 infection, older individuals have typically demonstrated superior psychological and mental well-being when contrasted with younger individuals based on their choices.

#### IV. METHODOLOGY

##### A. Data collection

The data set obtained from a survey of A weekly internet questionnaire collects data on the employment status, consumer spending, food security, housing, education disruptions, and physical and mental wellness of U.S. households during the pandemic from the DATA.GOV website.

##### B. Schema

Created a new database and imported data into a table in MYSQL and displayed the schema for a better understanding of the data set.

##### C. Data Preprocessing

To ensure the integrity and reliability of our analyses, a comprehensive data preprocessing phase was conducted on the dataset. Initially, a thorough examination of missing values was undertaken to address any potential data gaps. Subsequently, a meticulous check for dummy values was carried out to identify and rectify any anomalies in the dataset that might distort the analysis. To streamline the dataset and focus on relevant variables, unnecessary columns were systematically removed, optimizing the dataset for a more targeted investigation. Moreover, a rigorous process of identifying and replacing anomalies in the data was implemented, ensuring that outliers or inaccuracies did not unduly influence our findings. These steps collectively aimed to enhance the overall quality of the dataset, laying a robust foundation for subsequent analyses and interpretation of results.

##### D. Summary statistics and statistics

We used AWS Glue Data Brew to analyze the summary and statistics of columns following data pre-processing. An example of this analysis can be seen in FIG.1, which demonstrates the characteristics of the Time Period columns,

such as mean, median, mode, standard deviation, skew value, and the presence of outliers.

##### E. Feature selection

The selection of pertinent features is a critical aspect of our research methodology, as it directly influences the accuracy and interpretability of our analyses. To optimize the model’s performance and mitigate the risk of overfitting, a systematic feature selection process was employed. This involved an in-depth examination of the dataset to identify and prioritize variables that significantly contribute to the research objectives. The criteria for feature selection were guided by both statistical relevance and domain expertise, ensuring that the chosen features are not only statistically significant but also align with the theoretical underpinnings of the study. Furthermore, techniques such as correlation analysis and variance thresholding were applied to identify and eliminate multicollinearity and low-variance features, respectively. This judicious approach to feature selection not only streamlines the dimensionality of the dataset but also enhances the interpretability of the ensuing analyses, contributing to the robustness and validity of our research outcomes.

##### F. Approach to Research Questions

- For question 1, a systematic approach to address our research questions. Initially, we organized the data by education levels, creating a new data frame to focus our analysis on this crucial variable. Subsequently, we utilized this structured data to construct a bar graph, where the x-axis represented specific indicators, the y-axis denoted corresponding values, and distinct colors filled subgroups. This visual representation not only facilitated a clear understanding of data distribution but also allowed for a nuanced exploration of variations within each education level.
- For question 2, **For National estimation:** creating a focused data frame that isolated the National Estimate, allowing for a concentrated examination of trends at the national level. Subsequently, we employed a combination of line and point graphs, with the x-axis representing time period end dates and the y-axis capturing corresponding values. The use of color-coded indicators and varied data point shapes facilitated the representation of both temporal and spatial variations within the National Estimate group **For State wise for each Indicator:** created new data frames for each indicator and plotted on USA map by state filled with values
- For question 3, we systematically analyzed and compared four mental health indicators across various age subgroups. Specifically, we focused on 'Needed Counseling or Therapy But Did Not Get It,' 'Received Counseling or Therapy,' 'Took Prescription Medication for Mental Health And/Or Received Counseling or Therapy,' and 'Took Prescription Medication for Mental Health.' Each indicator was investigated independently within its own subset of

the age group dataset. To visually represent the findings, a multi-panel bar plot was created, with each panel showcasing a different indicator. The x-axis displayed age subgroups, and the y-axis depicted the corresponding indicator values. Distinct color palettes were applied to enhance visual differentiation between indicators. The resulting visual representation facilitates a comprehensive examination and comparison of mental health trends across diverse age groups, contributing to a nuanced understanding of the research questions. Grid lines in certain panels were incorporated for improved clarity and readability.

G. Modeling

linear regression was employed as a fundamental tool to explore the relationships between key variables. Specifically, we utilized linear regression analysis to quantify and understand the linear association between predictor and response variables in the context of our research questions. This statistical technique allowed us to model the relationships and estimate the strength and direction of the connections between variables. The choice of linear regression was motivated by its simplicity and interpretability, making it well-suited for elucidating the potential impact of independent variables on the dependent variable.

V.RESULTS

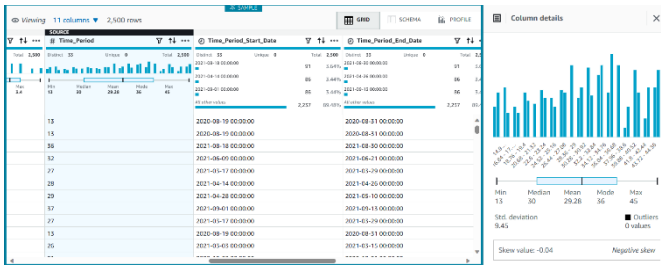


FIG.1: SUMMARY STATISTICS BY AWS GLUE

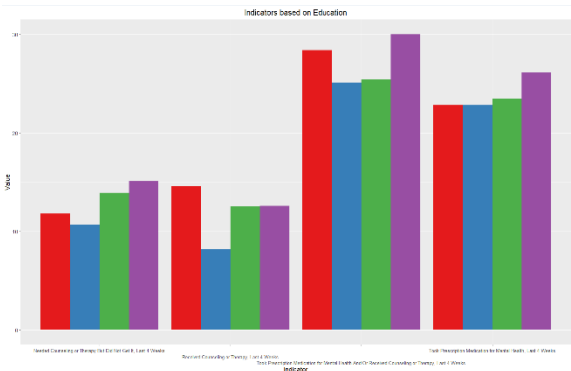


FIG.2: Value by education on each indicator

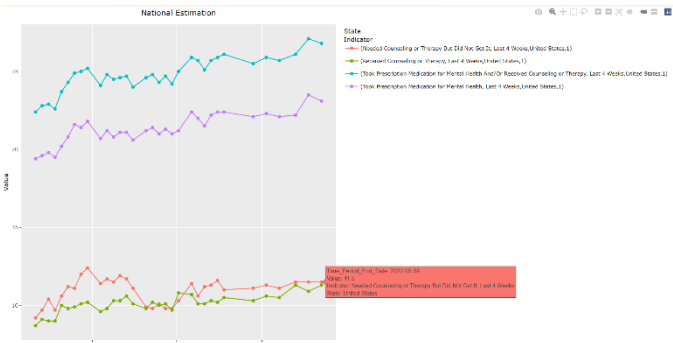


FIG.3: National Estimation

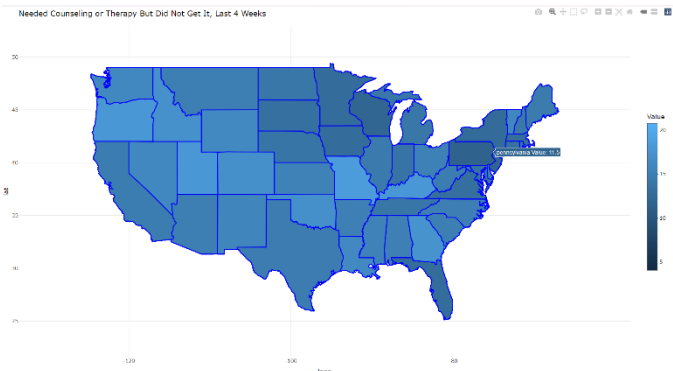


FIG.4: Value of state by Indicator

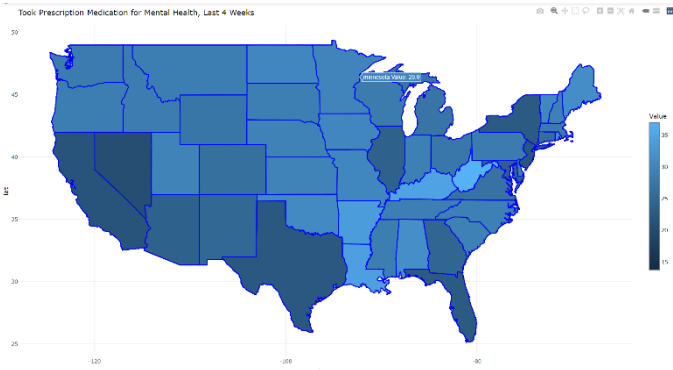


FIG.5: Value of state by Indicator

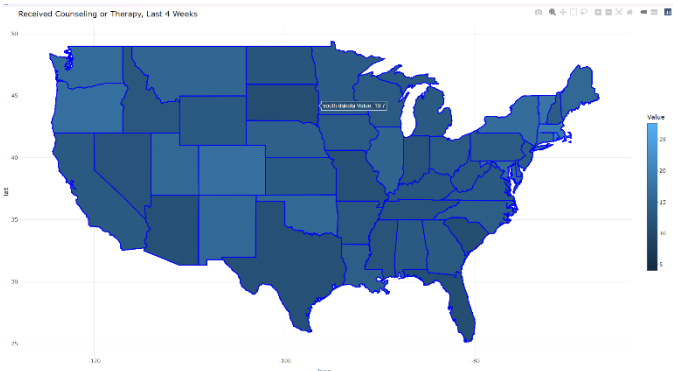


FIG.6: Value of state by Indicator

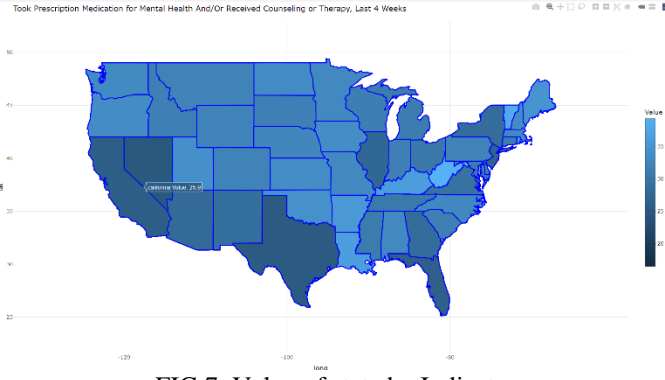


FIG.7: Value of state by Indicator

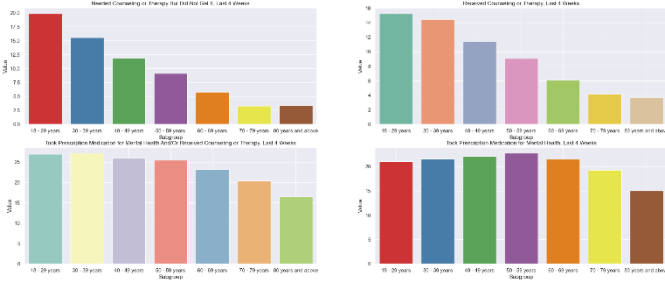


FIG.8: Value by age on each indicator

	Field	Type	Null	Key	Default	Extra
Indicator	text	YES		NULL		
By_Group	text	YES		NULL		
State	text	YES		NULL		
Subgroup	text	YES		NULL		
Phase	int	YES		NULL		
Time_Period	int	YES		NULL		
Time_Period_Start_Date	text	YES		NULL		
Time_Period_End_Date	text	YES		NULL		
Value	double	YES		NULL		
LowCI	double	YES		NULL		
HighCI	double	YES		NULL		

FIG.9:Schema of table

MSE	0.005461127
RMSE	0.07389944
MAE	0.05348155
R2	0.9999202

TABLE.1: Value of matrix

## VI. DISCUSSIONS

- As the MSE, RMSE, and MAE are low from Table 1, it indicates good accuracy of this model. Authors and Affiliations
- Based on the observations from the graph in Fig.2, it can be inferred that individuals with some college or an associate degree have the highest likelihood of undergoing mental health checkups or encountering mental health problems. On the other hand, people

with a high school diploma or GED appear to have a relatively lower prevalence of mental health issues.

- From Fig.3 , People who took Prescription Medication for Mental health, Last 4 weeks, united States,1 might be related to People who took Prescription Medication for Mental health And/Or Received Counselling or Therapy,Last 4 weeks, United States,1. It's important to note that many people who need counseling or therapy do not receive it.
- Most survey participants are from southern and southeastern regions of the country, as shown in Figures 4-7.

## VII. CONCLUSION

In summary, this comprehensive study investigates the profound impact of the COVID-19 pandemic on individuals' mental health across various dimensions. Through a meticulous methodology involving literature review, statistical analysis, and comprehensive data preprocessing, the research addresses three key questions: the influence of education on mental health care access, the impact of geographical locations on accessibility to mental health services, and the pandemic's effects on individuals across different age groups. Valuable insights from literature surveys highlight educational determinants, transformative opportunities within the U.S. mental health system, and age-related trends during the pandemic. Methodologically, the study employs rigorous data collection, preprocessing, and feature selection, with linear regression analysis revealing key relationships between variables. The findings offer nuanced perspectives for policymakers, healthcare providers, and researchers, contributing to a holistic understanding of the pandemic's far-reaching implications for mental health.

## VIII. LIMITATIONS

[4]"The Household Pulse Survey is an experimental online survey conducted by the Census Bureau and other federal agencies to collect data on the social and economic impacts of COVID-19 on American households". Compared to other benchmark surveys, the Household Pulse Survey is unique in terms of its design, implementation, and dissemination. [4][5]"It is designed to be a short-turnaround instrument that provides valuable data to aid in the pandemic recovery ". Producing benchmark data requires a relatively long lead time, and personal interviews (face-to-face or telephone) require additional time.[4] "While efforts are underway to include COVID-19 questions in these surveys, it can take months or even years for the data to become available".

## IX. FUTURE SCOPE

Collecting additional data, which may include a broader range of questions, has the potential to yield better quality data. Integrating different data sets can also aid in developing comprehensive analysis. Employing diverse models has the potential to produce more accurate predictive results.

Additionally, increased data pre-processing, such as the use of encoding methods, may lead to improved results.

## X. REFERENCES

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[2] R. K. McBain et al., “Transforming Mental Health Care in the United States,” *www.rand.org*, Jan. 2021, Available: <https://www.rand.org/pubs/researchbriefs/RBA889-1.html>

[3] N. Panchal and H. Saunders, “The Implications of COVID-19 for Mental Health and Substance Use,” KFF, Mar. 20, 2023.

<https://www.kff.org/mental-health/issue-brief/theimplications-of-covid-19-for-mental-health-and-substanceuse/>

[4] U. C. Bureau, “Household Pulse Survey,” The United States Census Bureau.

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