Mental Health Factors and Covid

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[1] "/Users/annalisecramer/MADA/CRAMER-MADA-Project"

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# 1. Summary/Abstract

Isolation and quarantine strategies employed for containment of SARS-Cov-2 infection led to unexpected mental health struggles among the population of the United States. Infected individuals and healthy individuals were affected, but little is known about the potential relationships between mental health and physical health. In this study, we utilized Nataional Health Information Surveys from 2019-2021 to examine the relationships between receieving a positive COVID-19 test and self reporting mental health factors such as meeting recommended guidelines for exercise, meeting the recommended number of hours of sleep per night, reporting feeling depressed recently, reporting having trouble sleeping recently, and reporting receiving less social support.

We find

# 2. Introduction

## 2.1 General Background Information

During the SARS-CoV pandemic, methods implemented to control the transmission of the disease had broader societal impacts. A common complaint surrounding social distancing and quarantine policies is the effects on mental health 1. This study aims to better understand the associations between mental health factors and contracting covid. Using data from the National Health Interview Surveys collected during the SARS-CoV-2 pandemic, simple and multiple regression models are created.

Cite this properly later: 1.) https://www.tandfonline.com/doi/full/10.1080/09638237.2020.1757052

## 2.2 Description of data and data source

Data for this project is survey data collected from the National Health Interview Survey, produced by IPUMS through the University of Minnesota. This data was collected among United States residents of all ages and genders from 2019 - 2022 in the United States.

## 2.3 Questions/Hypotheses to be addressed

1.) What is the prevalence of poor mental health? 2.) Is poor mental health associated with a positive covid test?

Factors studied will include hours of sleep, reported depressed mood, reported trouble sleeping, recent exercise, and reported social/emotional support.

# 3. Methods

Data was subsetted to years 2019-2022, to cover the brunt of pandemic years. Despite low prevelance of COVID-19 cases in 2019 worldwide, the appearance of COVID-19 in the news (and consequential potential impact on mental health factors) led us to include this data. The final dataset contains 151406 observations.

Variables of interest contained significant amounts of missing information, so multiple imputation was used, creating 5 sets of imputed data that was averaged across the remainder of analysis to produce variables and statistics needed. Complex survey design was used to allow for generalizability of results, using vairbales PSU, STRATA, and SAMPWIEGHT.

Binary variables were created to allow for interpretability.

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Survey design variables were used and new binary variables were created from other variables. Using complex survey design variables, a descriptive table was created.

I will create models (basic and adjusted) to study association (generating prevelance ratios with CIs) between mental health factors (hours of sleep, feeling depressed mood, amount of social and emotional support, trouble sleeping, recent exercise benchmarks) with a postiive covid test result. I will generate tables and plots for all results.

## 3.1 Schematic of workflow

Sometimes you might want to show a schematic diagram/figure that was not created with code (if you can do it with code, do it). fig-schematic is an example of some - completely random/unrelated - schematic that was generated with Biorender. We store those figures in the assets folder.

## 3.2 Data aquisition

This data was obtained from IPUMS, used with permission.

## 3.3 Data import and cleaning

The following code details the data cleaning process. Labels are removed from the data to make it easier to work with to create models later in the process. Variables needed are selected, then a series of binary varibales are created. Additional details are available in the processing folder.

## 3.4 Statistical analysis

*Explain anything related to your statistical analyses.*

We will begin with exploratory tables to explore proportions of NA answers, and generate early estimates.

Our first figure with be a discriptive table stratified by COVID status, with estimates and 95% CIs.

Next, we will construct simple models before moving onto adjusted models.

# 4. Results

## 4.1 Exploratory/Descriptive analysis

The first table below details the proportion of NAs for each mental health variable. We can see this is a little bit high, which may affect analysis later on. Histograms of each variable are available in the eda folder.

The second table shows proportions calculated using complex survey design variables.

[Table 1](#tbl-summarytable) shows a summary of the data.

[1] "/Users/annalisecramer/MADA/CRAMER-MADA-Project"

|  |
| --- |
| Table 1: Table. 1. Mental health characteristics among Americans from 2019-2022, by SARS-CoV-2 test result status, NHIS |

## 4.2 Basic statistical analysis

*To get some further insight into your data, if reasonable you could compute simple statistics (e.g. simple models with 1 predictor) to look for associations between your outcome(s) and each individual predictor variable. Though note that unless you pre-specified the outcome and main exposure, any “p<0.05 means statistical significance” interpretation is not valid.*

fig-result shows a scatterplot figure produced by one of the R scripts.

## 4.3 Full analysis

*Use one or several suitable statistical/machine learning methods to analyze your data and to produce meaningful figures, tables, etc. This might again be code that is best placed in one or several separate R scripts that need to be well documented. You want the code to produce figures and data ready for display as tables, and save those. Then you load them here.*

Example tbl-resulttable2 shows a summary of a linear model fit.

# 5. Discussion

## 5.1 Summary and Interpretation

*Summarize what you did, what you found and what it means.*

## 5.2 Strengths and Limitations

*Discuss what you perceive as strengths and limitations of your analysis.*

## 5.3 Conclusions

*What are the main take-home messages?*

*Include citations in your Rmd file using bibtex, the list of references will automatically be placed at the end*

This paper [@leek2015] discusses types of analyses.

These papers [@mckay2020; @mckay2020a] are good examples of papers published using a fully reproducible setup similar to the one shown in this template.

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# 6. References