

# Not All Patients Are Treated Equally

Customizing Telehealth  
Patient Care to Increase  
Efficiency and Effectiveness



# A Tale of Three Patients



Sam

- **Pre-Assessment:**  
Several hidden risk factors not caught on assessment
- Not recommended for therapeutic sessions
- **Not pleased with their level of care, Sam found a different provider**



Carla

- **Pre-Assessment:**  
Recently recovered from mental health struggles
- Scheduled for therapy sessions, but did not engage
- **Care network had to adapt to her new level of need**



Jose

- **Pre-Assessment:**  
Struggling with recent tragedy
- Reported his needs accurately, provided appropriate care
- **Reported positive results with our client, his company**



Can Modern  
Health better  
identify patient  
needs using  
their data?



# When A Patient's Needs Are Misdiagnosed...



## Appropriate Care

The patient's care does not match their need



## Network Efficiency

The service network must adapt to their actual need



## Client Expectations

Customer Success metrics falter as engagement drops





## Hypothesis

We can improve patient care identification using patient demographic and habit data



## Metric

### **Patient Care Level Change:**

How much a patient's care changes from their initial classification

**Success:** Statistically significant reduction in the Patient Care Level Change

# Current/Potential Challenges

## Demographics

Modern Health clients may trend differently than U.S. population

## Metrics

Unavailable metrics may be much more effective

## Care Providers

Each patient's therapist has a weight in their experience/outcomes

## Evaluation Data

Proprietary Data is needed to accurately train or test a model

# The Data

- NHANES
  - Yearly CDC health survey
  - Generally reflective of general US population (5,426 adults)
  - 46 useful metrics
  - **Key Metric: Depressive Episodes**
- Additionally CDC surveys
  - Access and Use of Telemedicine During COVID-19
  - Telemedicine Use in the Last 4 Weeks
  - Provided access and usage data





# Tools and Methods

## Pandas



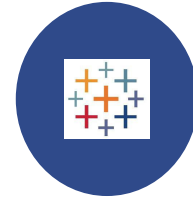
Used to download SAS files as a spreadsheet

## Google Sheets



All data was loaded, cleaned, and organized. Initial EDA was completed.

## Tableau

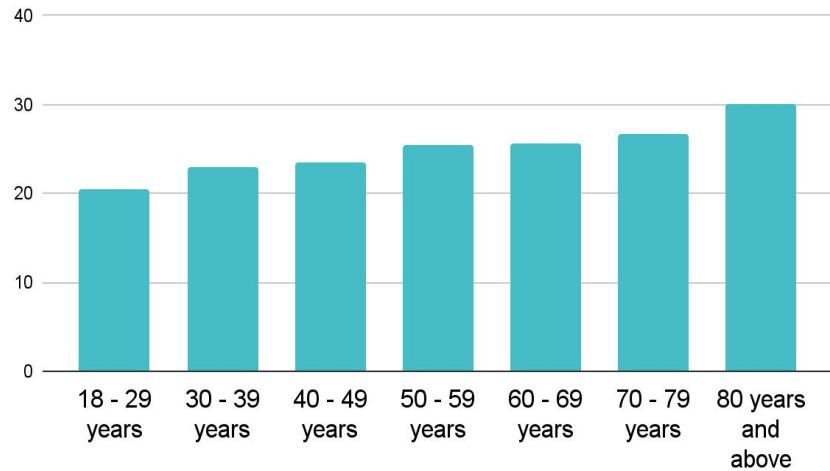


Visual EDA and other visualizations were combined into finished Dashboard.



# ANALYSIS

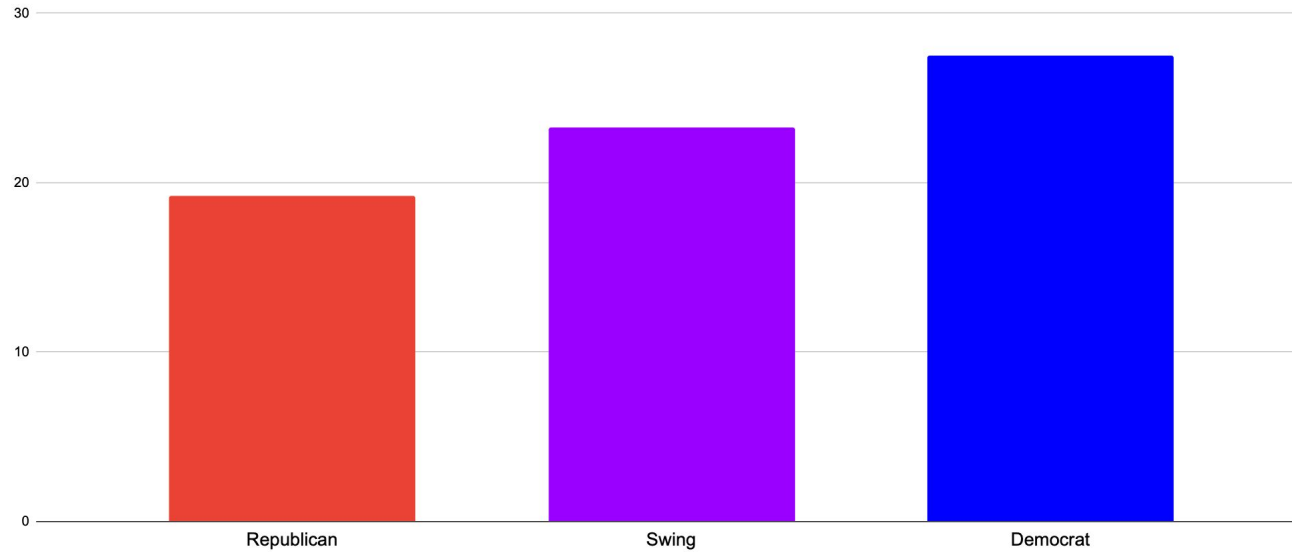
% Adults Who Had a Telehealth Appointment vs Age

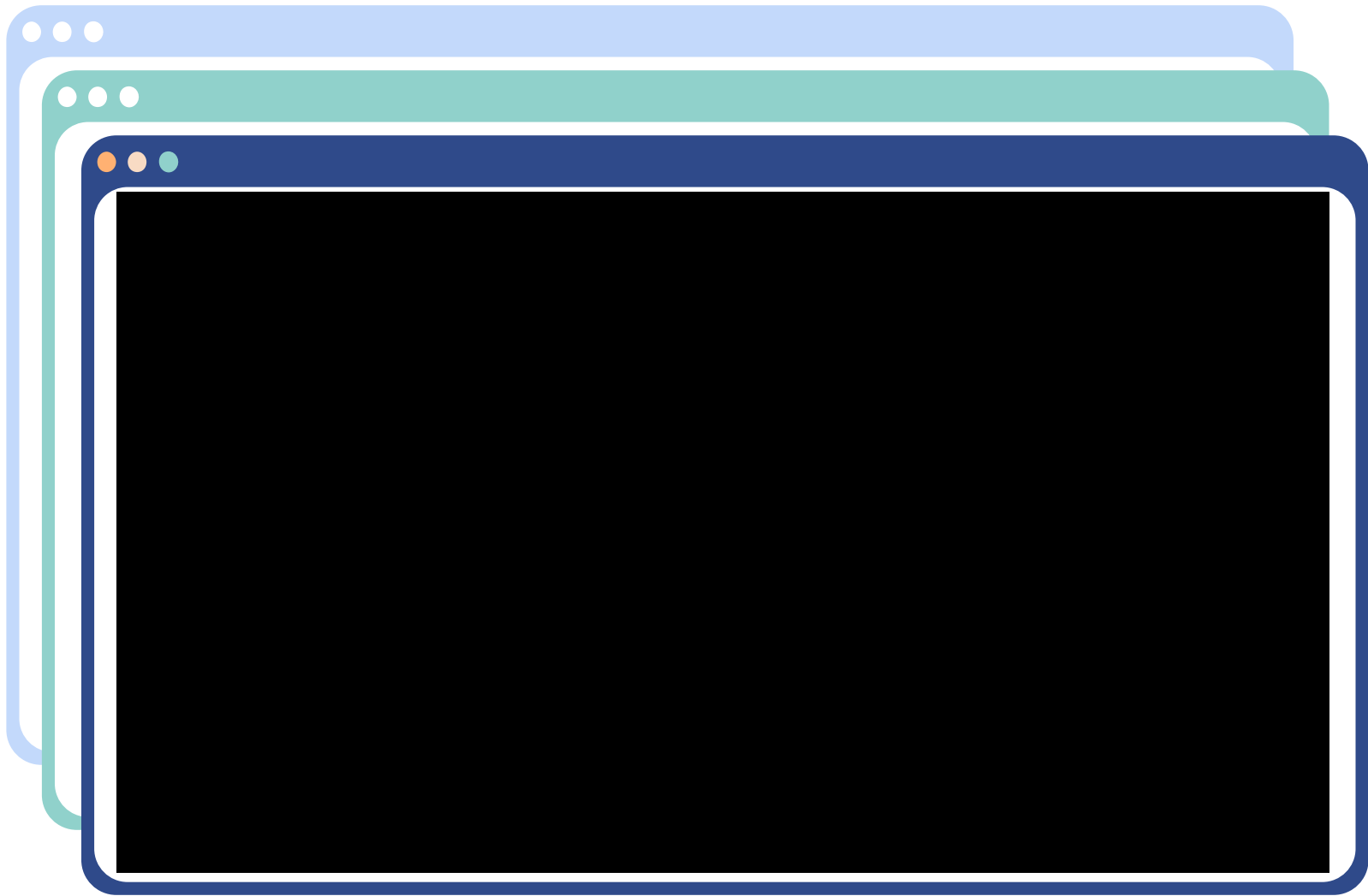


## Usage by Age

# Usage By Political Leaning

% Adults Who Had a Telehealth Appointment vs. Their State's Political Leaning





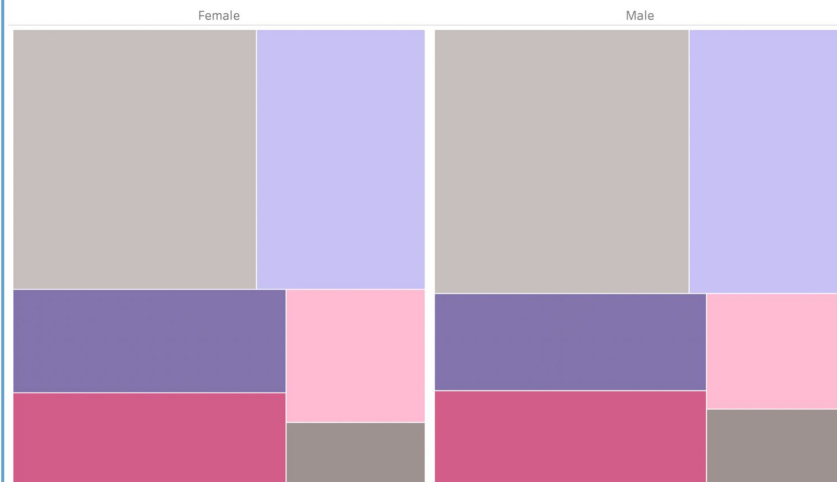
# Predicting Therapeutic Need: An Analysis of Depression Frequency



Source: <https://www.cdc.gov/nchs/nhanes/>

## Demographics

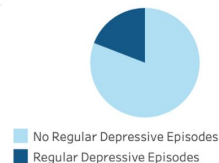
While a patient's demographics do not have a clear relationship with their mental health risks, the connections to different factors raise interesting questions. Click on a demographic to explore the relationships.



## Demographic Sample

Regular Depressive Episodes 1,098

Total Sample Size 5,426



## Demographic Filters

Ages  
15  80

Ethnicity  
■ Asian  
■ Black  
■ Hispanic/Mexican  
■ Hispanic/Non-Mexican  
■ Multi-Racial  
■ White

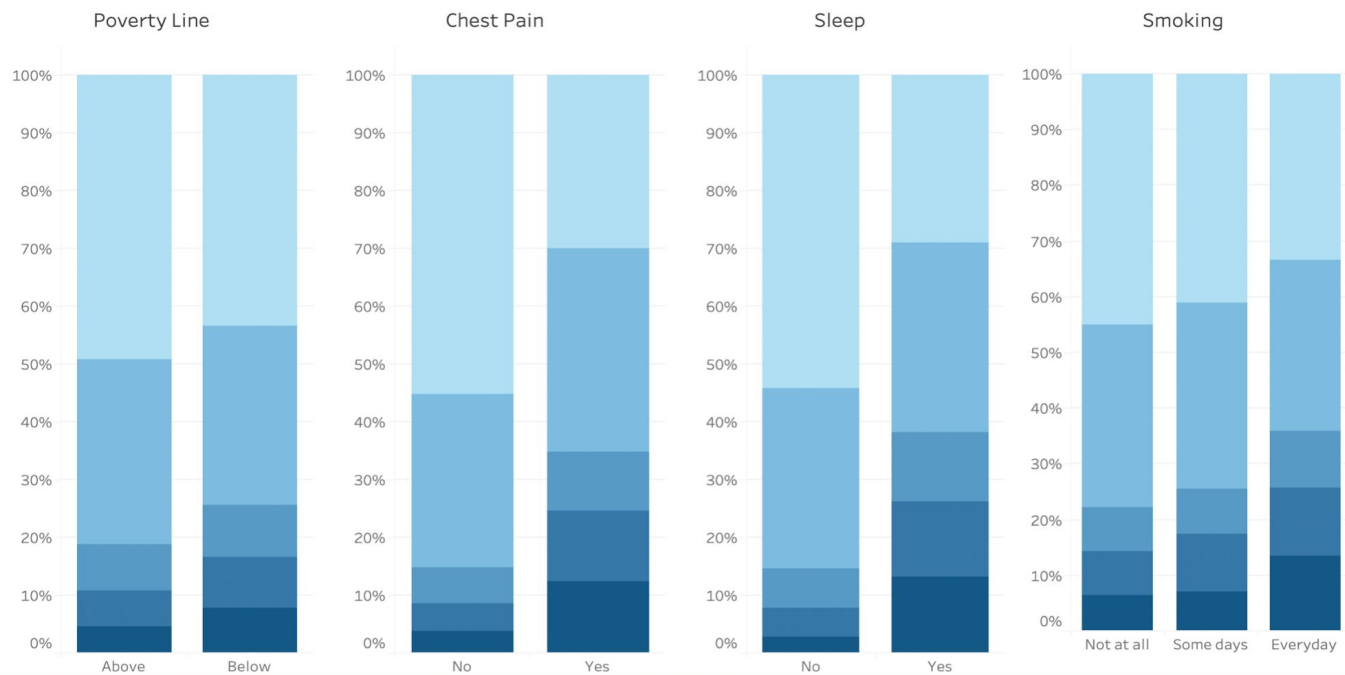
#### Rate of Depressive Episodes

Never Monthly  
Yearly Weekly

Daily

### Potential Factors For Depression

Each graph shows the percentages of depressive episode rates (daily, weekly, etc.) as compared to the factor.





**RESULTS/  
NEXT STEPS**



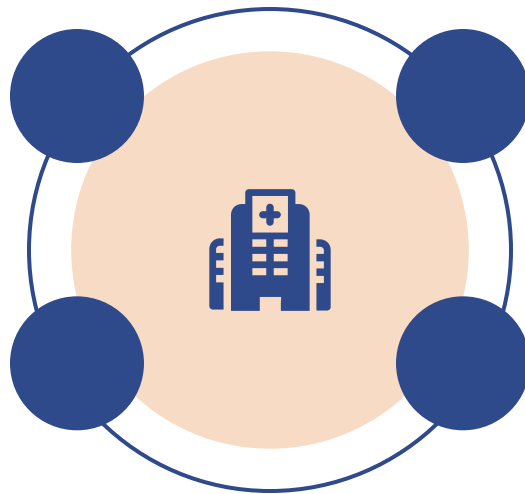
# Key Takeaways

## Demographics

Inform usage, not therapeutic need

## Risk Factors

Several risk factors are available in our assessment



## Political Leaning

May be useful for anticipating use

## Metric Relationships

The most valuable metrics may be their relationships

# Next Steps



## Data Collection

Obtain, Clean, and Structure  
Proprietary Data

## Model Build

Linear Regression ML model will  
use historical Modern Health data  
to identify key factors

## Evaluate and Refine

Historical and current patient  
data will be used to evaluate  
model effectiveness and use



**Thank You!**