**Project Documentation: *The Hidden Crisis in Male Mental Health***

**1. Project Overview**

This project explores the prevalence of mental disorders in the United States, focusing on gender differences in diagnosis and treatment. While mental health affects everyone, men are significantly less likely than women to seek or receive treatment. The goal of this analysis is to visualize:

* How mental disorder prevalence varies across states.
* How treatment rates compare to prevalence.
* Where men receive the most treatment.
* Where men are most underserved.

The final deliverable combines interactive Plotly visualizations with a designed infographic (created in Affinity Designer) to tell a clear, data-driven story.

**2. Data Sources**

* **NSDUH (National Survey on Drug Use and Health)** – State-level estimates of adults (18+) with any mental illness (AMI) and those receiving treatment.
* **U.S. Census Bureau (SC-EST2023-AGESEX-CIV)** – Civilian population estimates by state, sex, and age. Used to calculate denominators for percentage estimates.
* **NIMH / SAMHSA gender-split summary tables** – National-level prevalence and treatment percentages by gender (e.g., 41.6% of men vs 56.9% of women with AMI receiving treatment).

**3. Data Preparation**

**Tools used:** Python (Pandas, GeoPandas, Plotly), VS Code, Excel (for inspection).

Steps:

1. **Load & clean NSDUH data**
   * Removed metadata rows and unnecessary “Order” column.
   * Converted string-based estimates (e.g., "12,345") to numeric floats.
   * Renamed columns for clarity (e.g., Estimate\_18plus).
2. **Merge disorder and treatment data**
   * Combined state-level prevalence (Disorder\_18plus) with treatment received (Treatment\_18plus).
3. **Integrate population denominators**
   * From Census data, calculated total adults 18+ and adult men 18+.
   * Merged with NSDUH estimates to compute true state percentages.
4. **Gender adjustment**
   * Applied national-level male prevalence/treatment percentages to scale state estimates.
   * Created new metrics:
     + EstimatedMenWithAMI
     + EstimatedMenTreated
     + MaleTreatmentRate
     + EstimatedMaleTreatmentGap

**4. Analysis & Calculations**

* **Disorder Prevalence (DisorderPct):**  
  % of total adults 18+ estimated to have AMI in each state.
* **Treatment Rate (TreatmentPct):**  
  % of adults 18+ estimated to have received treatment.
* **Male Treatment Rate (MaleTreatmentRate):**  
  Adjusted estimate of % of men with AMI who receive treatment.
* **Treatment Gap:**  
  Estimated men with AMI – estimated men treated.

**5. Visualizations**

**A. Maps (Problem vs Response)**

* *Red map:* Prevalence of mental disorders by state.
* *Blue map:* Treatment received by state.  
  These show the disparity between how widespread mental illness is and how many people seek or receive care.

**B. Bar Charts (Male Focus)**

* *Top 10 states (blue, upward bars):* Where men are most likely to get treatment.
* *Bottom 10 states (red, downward bars):* Where men are least likely to get treatment.

**C. National Context Box**

* 41.6% of men with AMI receive treatment, compared to 56.9% of women.
* This emphasizes the overall gender gap that frames the state-level story.

**D. Conclusion Statement**

* *“Men are consistently less likely to receive treatment for mental illness — and in some states the gap is staggering.”*

**6. Tools & Skills Demonstrated**

* **Python (Pandas, GeoPandas):** Data cleaning, transformation, merging datasets.
* **Plotly:** Interactive maps and bar charts; choropleth design.
* **Affinity Designer:** High-quality static infographic for portfolio presentation.
* **Data storytelling:** Turning raw percentages into a narrative flow (problem → response → best states → worst states → conclusion).

**7. Key Insights**

* Disorder prevalence varies widely by state (e.g., Oregon, West Virginia among the highest).
* Treatment rates sometimes exceed prevalence (e.g., Vermont), reflecting that treatment includes both diagnosed and non-diagnosed populations.
* Nationally, men are less likely to seek treatment, and in the worst states, fewer than 25% of men with mental illness are estimated to receive care.
* This highlights a **systemic gender gap** in mental health treatment access.

**8. Next Steps (if expanding)**

* Add female-specific breakdowns for a direct male vs female comparison by state.
* Explore age-stratified treatment rates.
* Extend into trends over time (if longitudinal NSDUH data is pulled).
* Build a web dashboard (e.g., Streamlit or Dash) for fully interactive exploration.

**9. Files Produced**

* mmh.py → Python script (data cleaning, processing, and visualization).
* ami\_by\_gender.csv → Gender-specific national treatment percentages.
* treatment\_received.csv, mental\_disorder.csv, sc-est2023-agesex-civ.csv → Raw input data.
* fig\_dis.jpg, fig\_treat.jpg, fig\_rate.jpg, fig\_bottom\_gap.jpg → Final static charts (300 DPI).
* male\_mental\_health\_visual.pdf → Final infographic (Affinity Designer).