Recognizing Medicare Opioid Prescriber Patterns to Provide Initial Indicator of Potential Abuse

Randy Grant (DSML)

Introduction

Issue: The client, AcmeMedicareScripts, needs a way to able to identify any trends in opiate prescriptions with existing Medicare Part D prescriber data

Solution: With sample data created from the 2019 Medicare Part D prescriber population data prescriber information:

- trends without a machine learning model can be visualized
- data can be added to the existing dataset

Goal: Recognize trends of how opioids are prescribed, a deviation from the median could be identified that will assist in preventing potential overdoses or abuse across Medicare patients

Methods

Data Used

- Kaggle.com sample datasets
- Medicare Part D Prescribers - by Provider and Drug
- State Abbreviations
- Tools Used:
  - Excel for data exploration
  - Tableau Prep Builder for data transformations
  - Tableau Public for visualizations
- Metrics Created:
  - Sample of Medicare Part D Prescribers: Opioid Prescription Volume Percentage Comparison Across the U.S. for 2019 with Death Percentage Comparison
  - Sample of Medicare Part D Prescribers: Opioid Prescription Count By Drug Name and Specialty for 2019
  - Sample of Medicare Part D Prescribers: Geographic Spread of Specific Opioid Prescriptions by State and Medical Specialty for 2019
  - Sample of Medicare Part D Prescribers: Top Opioid Prescribers Split by Drug Name for 2019

Data Dictionary

- NPI – unique National Provider Identifier number
- Gender - (M/F)
- State - U.S. State by abbreviation
- Credentials - set of initials indicative of medical degree
- Specialty - description of type of medicinal practice
- Total number of prescriptions written for the year by the NPI by Drug name
- Opioid.Prescriber - boolean value (0 or 1) indicating whether or not that NPI prescribed opiate drugs more than 10 times in the year

Reference: https://www.kaggle.com/datasets/apryor6/us-opiate-prescriptions

Sample Data

Raw (Excel):

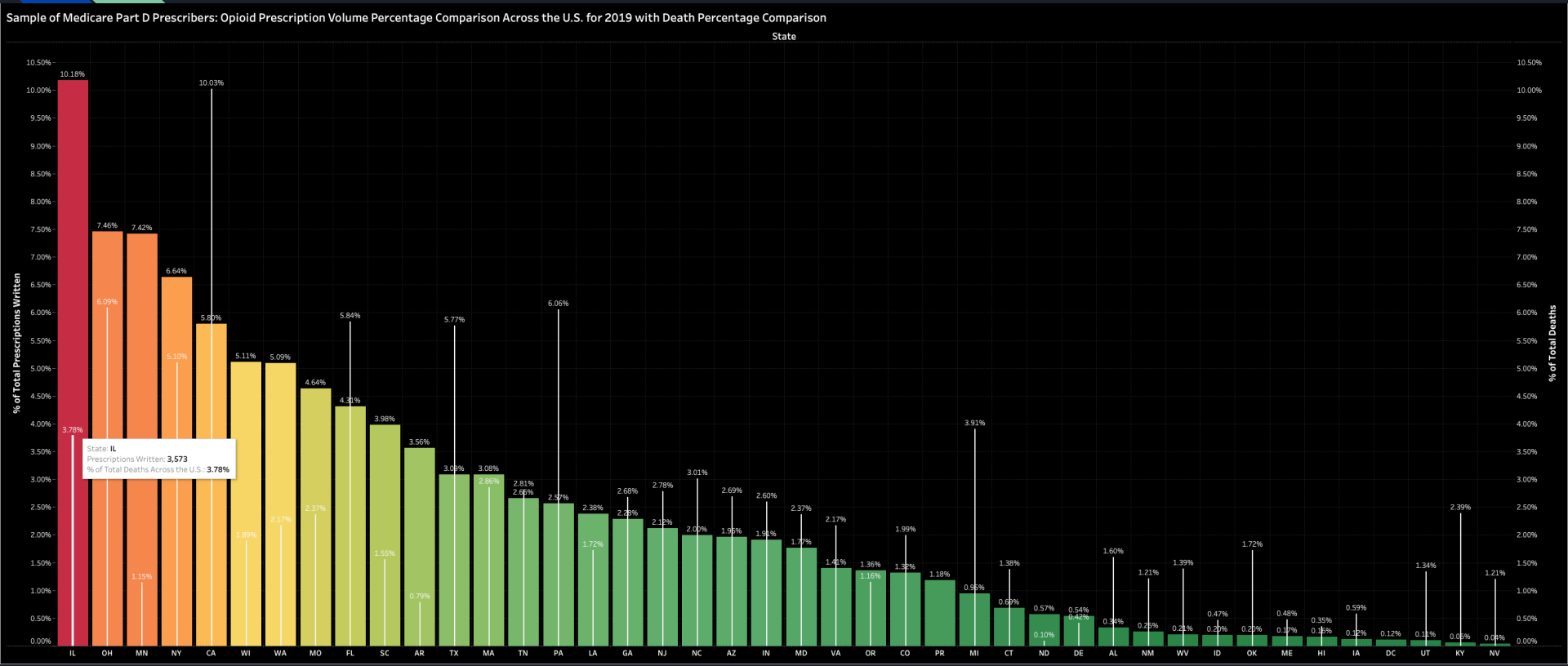
NPI	Gender	State	Credentials	Specialty	ABILIFY	ACETAMINOPHEN CODEINE
1588788921	M	CT	unknown	Hematology/Oncology	0	0
1801816095	M	FL	unknown	Neurology	0	0
1205126695	F	NC	unknown	Internal Medicine	0	0
1588612477	F	CA	unknown	Emergency Medicine	0	0

Final Snippet (Tableau):

Extract Prescriptions Writ...	Extract Drug Names	Extract NPI	Extract Gender	Extract State	Extract Credentials	Extract Specialty	Extract Opioid Prescriber	Extract Drug Name
13	OXYCODONE ACETA...	1,316,979,172	F	WA	unknown	Physician Assistant	1	OXYCODONE ACETA...
0	OXYCODONE HCL	1,316,979,172	F	WA	unknown	Physician Assistant	1	OXYCODONE HCL
0	OXYCONTIN	1,316,979,172	F	WA	unknown	Physician Assistant	1	OXYCONTIN
0	TRAMADOL HCL	1,316,979,172	F	WA	unknown	Physician Assistant	1	TRAMADOL HCL
0	ACETAMINOPHEN CO...	1,538,221,965	M	AR	unknown	Dentist	1	ACETAMINOPHEN CO...
0	ACETAMINOPHEN CO...	1,538,221,965	M	AR	unknown	Dentist	1	ACETAMINOPHEN CO...
0	FENTANYL	1,538,221,965	M	AR	unknown	Dentist	1	FENTANYL
27	HYDROCODONE ACE...	1,538,221,965	M	AR	unknown	Dentist	1	HYDROCODONE ACE...

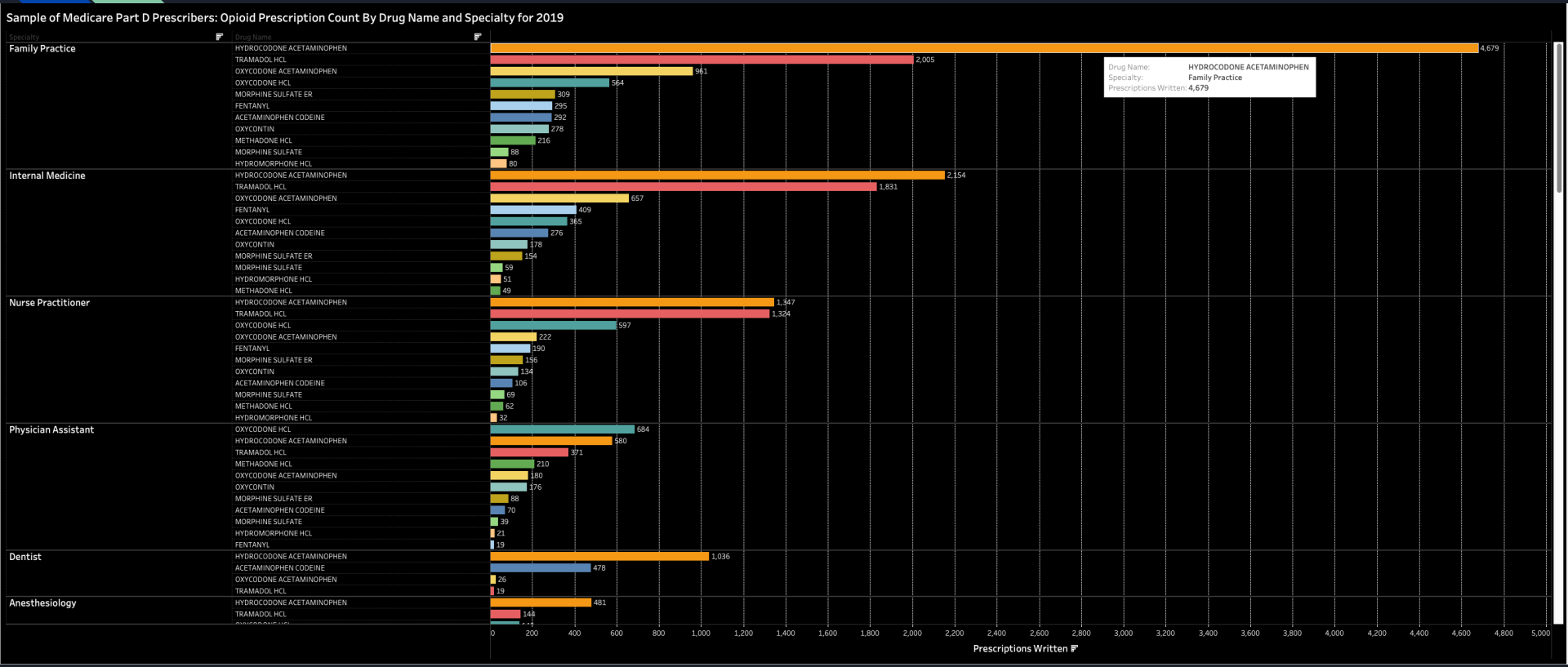
Metrics

[Tableau Public Link]



Metrics

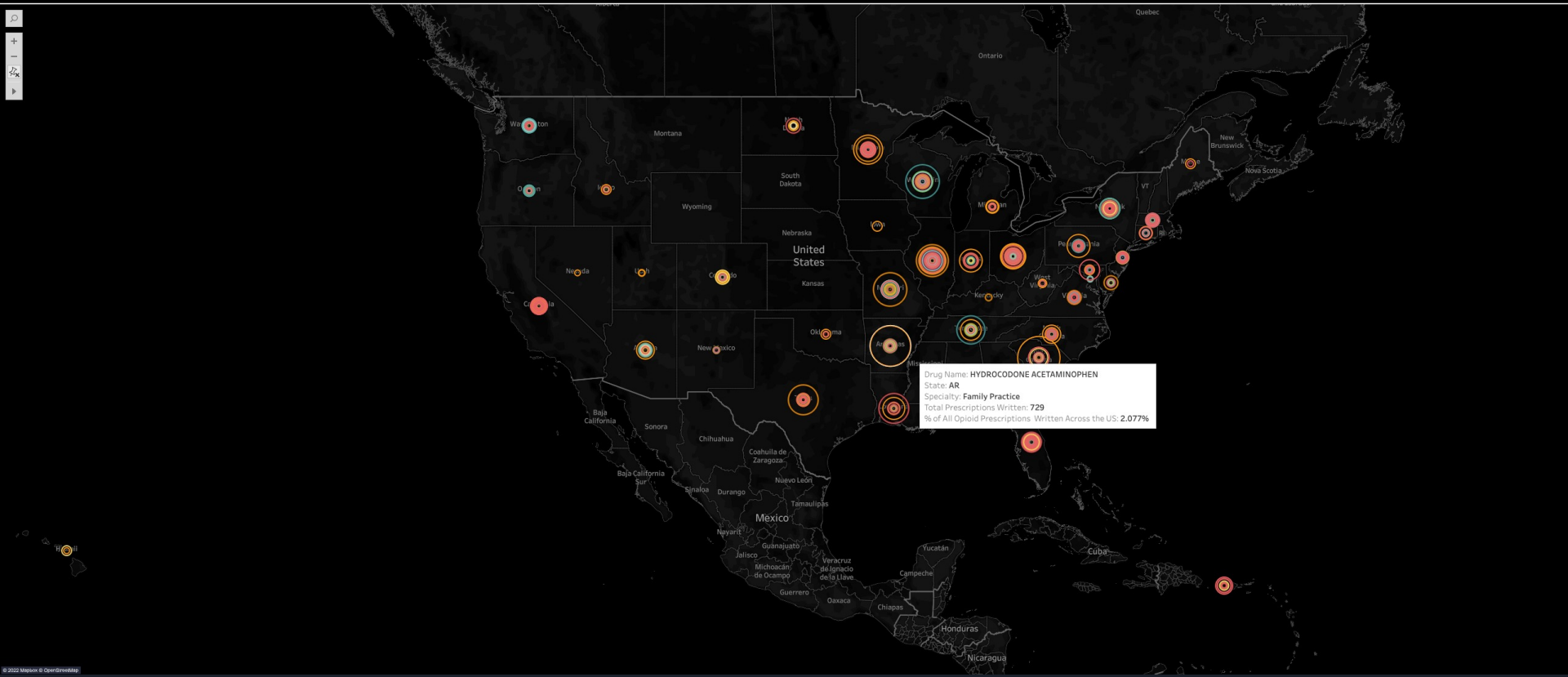
[Tableau Public Link]



Metrics

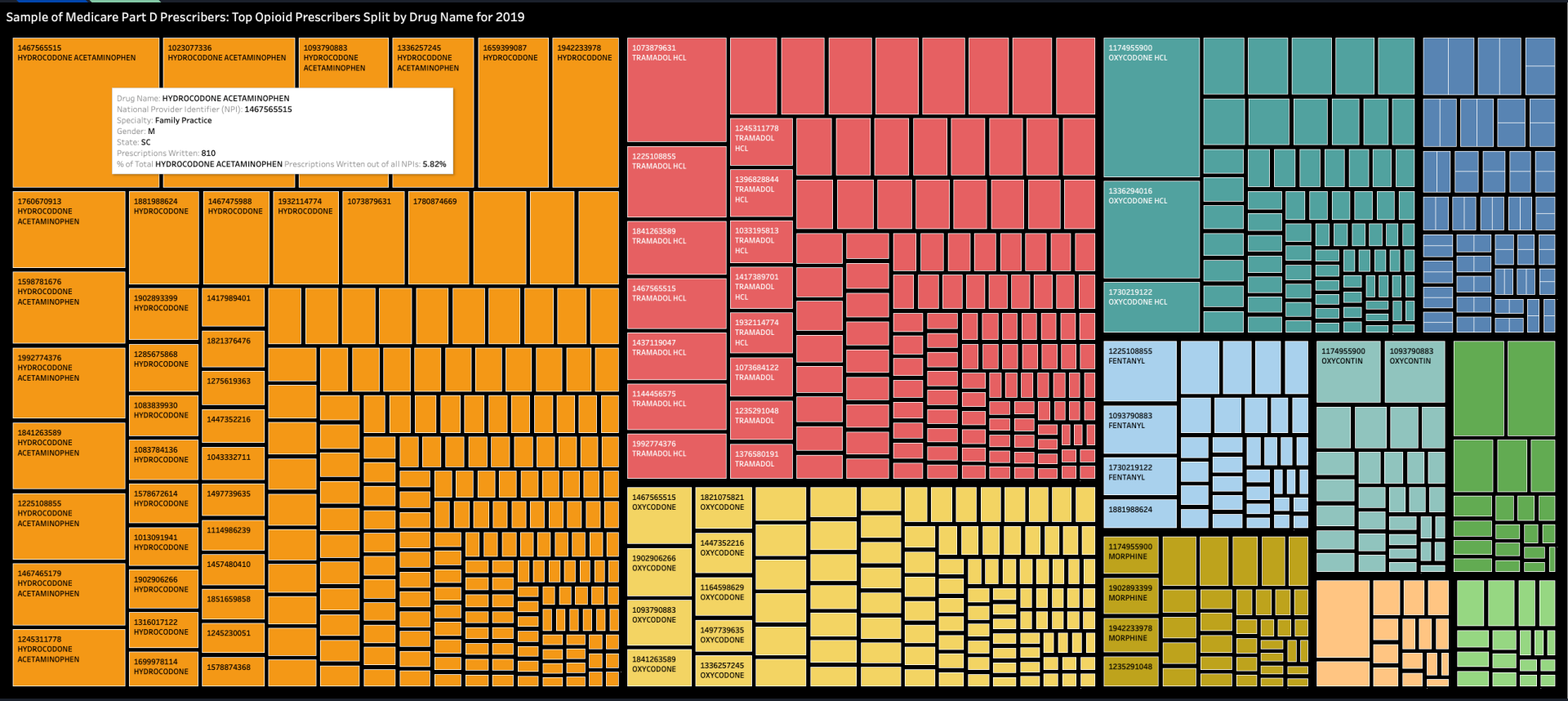
[Tableau Public Link]

Sample of Medicare Part D Prescribers: Geographic Spread of Specific Opioid Prescriptions by State and Medical Specialty for 2019



Metrics

[Tableau Public Link]



Appendix

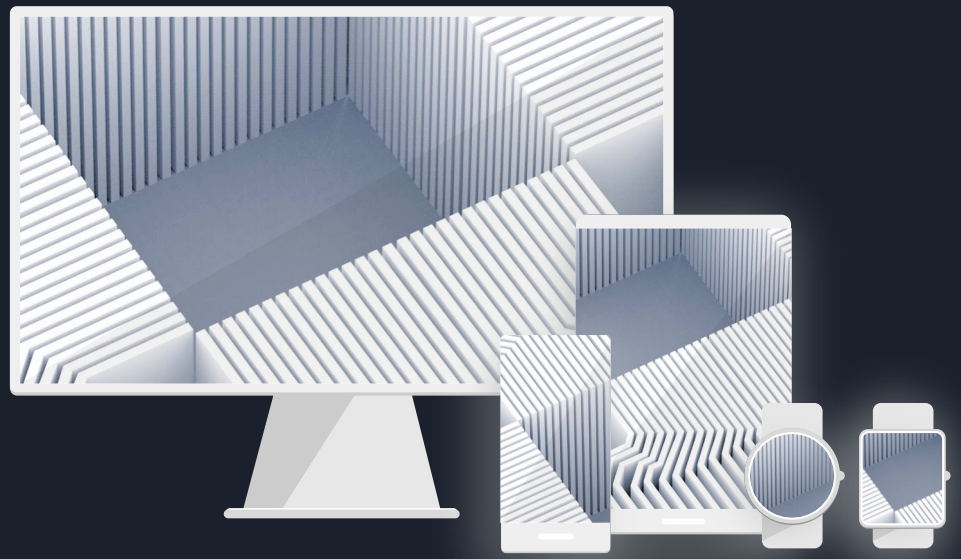
https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Provider-Charge-Data/Part-D-Prescriber

https://data.cms.gov/provider-summary-by-type-of-service/medicare-part-d-prescribers/medicare-part-d-prescribers-by-provider-and-drug

https://data.cms.gov/resources/medicare-part-d-prescribers-methodology

https://www.kaggle.com/datasets/apryor6/us-opiate-prescriptions

https://www.infoplease.com/us/postal-information/state-abbreviations-and-state-postal-codes

Thank you!

Questions?