# Data Viz Midterm Project

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The following report was created based on the Medicare\_Part\_D\_Prescribers\_by\_Provider\_2022 dataset, which initially contained 1,332,159 observations across 24 variables. Four observations were dropped due to containing null information. An additional filter was applied to focus on the top 10 cities in Florida with the highest number of claims. As a result, all graphs will be related to Miami, Jacksonville, Tampa, Orlando, Hialeah, Fort Myers, Sarasota, Ocala, Lakeland, and Naples.

Graph 1: Top 10 Cities in Florida by Total Claims

#Top 10 cities filing Medicare claims related to drug medication for Medicare beneficiaries. In first place is the city of Miami, with around 10 million accumulated claims in 2022, followed by Jacksonville and Tampa with 5 million and 4 million claims, respectively. These top ten cities collectively account for around 38 million claims, out of Florida's total of 118 million claims. This represents around 33% of all Florida claims.

A graph of different colored squares

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The Medicare Part D program is a federal insurance program in the U.S. designed primarily for people over 65 years old and younger individuals with disabilities. Medicare Part D is a part of the Medicare program that provides drug coverage.

Graph 2: Heatmap of Demographic Characteristics by City

#Miami stands out among all cities, as it has the darkest color in all categories, indicating a larger number of claims in this city. Additionally, Miami has the largest Hispanic population compared to all other cities, where there is a consistency of White populations. We can also see that the female population tends to be predominant in all cities.

A chart of a map of demographic characteristics

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#This density plot represents the distribution of total drug costs under Medicare Part D. On the x-axis, we can observe that the total cost ranges from 0 to 15 million, while the density shows the frequency of total drug costs. We can see high density near 0 million, with several outliers as the cost increases. This graph displays a right-skewed distribution.

Graph 3: Total Claims Composition by City

#In this chart, we can see the drug claims per city divided by drug type. In all the cities, the majority of drug claims are for Generic drugs, which account for between 83.9% and 86.6% of the total claims.

A graph of a number of different colored squares

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Graph 4: Distribution of Total Claims per Prescriber by City

In Florida, a prescriber is considered any licensed healthcare professional. These include physicians, nurse practitioners, physician assistants, among others. It is important to note that a prescriber must be a licensed individual, not an institution such as a hospital or other facility.

#On the x-axis, we can find the breakdown of the number of claims filed by prescribers per city. The boxplot represents the interquartile range. Based on the previous chart, the minimum number of claims submitted was 11 across all cities, with varying maximum numbers. The largest outlier is in Miami, with a total of 67,440 claims annually, followed by Hialeah and Fort Myers with 52658 and 33388.

A graph of a number of cities

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Graph 5: Density Plot of Drug Cost

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Medicare Part D. On the x-axis, we can observe that the total cost ranges

from 0 to 15 million, while the density shows the frequency of total drug

costs. We can see high density near 0 million, with several outliers as the

cost increases. This graph displays a right-skewed distribution.

A graph of a drug cost

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Graph 6: City Comparison: Drug Cost vs. Claim volume

#This chart helps visualize the relationship between claims and drug cost, based on prescriber volume across different cities.

A graph showing the cost of drugs

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Findings:

* Most Medicare recipients are women. Miami has the largest Hispanic population among recipients. Black and White populations are more evenly distributed across cities.
* Generic drugs are dominant, accounting for a total of 84% to 87%.
* Ocala, Naples, and Lakeland have lower variability in claims per prescriber, which suggests more consistent prescribing behavior compared to cities like Miami, Hialeah, and Fort Myers.
* The number of outliers in cities such as Miami and Hialeah raise questions about prescribing patterns, with fewer prescribers filing a high number of claims.  
  While most claims are low-cost, a small number of prescribers are increasing the overall cost.