



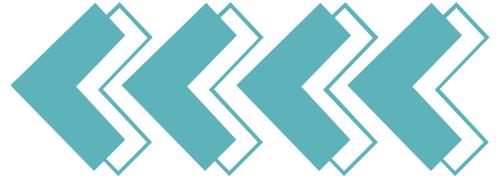
Created by Darios Brown

# PRESCRIPTION DRUG SPENDING IN THE U.S.



Advocating for Affordable Medication Access





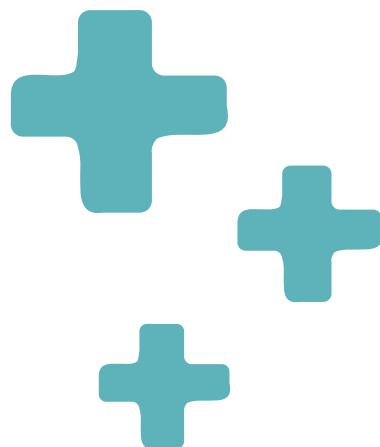
# NAVIGATING THE FRONTIERS OF HEALTHCARE

## EXPLORATION OF INNOVATIONS IN MEDICINE

Federal initiatives like Medicare's Drug Price Negotiation Program are driving greater price transparency and paving the way for affordable generic alternatives, especially in underserved areas.

### INTRODUCTION

Shining a light on the growing issue of overpriced prescription medications and how data-driven insights can empower communities to demand fairer drug pricing.

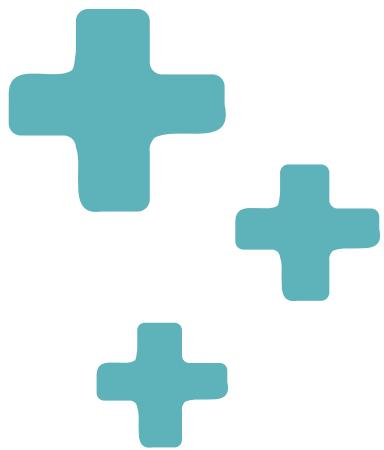




# THE FUTURE OF MEDICAL SCIENCE



- Advancements in data analytics and AI are enabling more transparent drug pricing and personalized treatment plans.
- The rise of biosimilars and improved generics promises to expand access to effective, lower-cost medication alternatives.



# EXPLORING BREAKTHROUGHS AND CHALLENGES

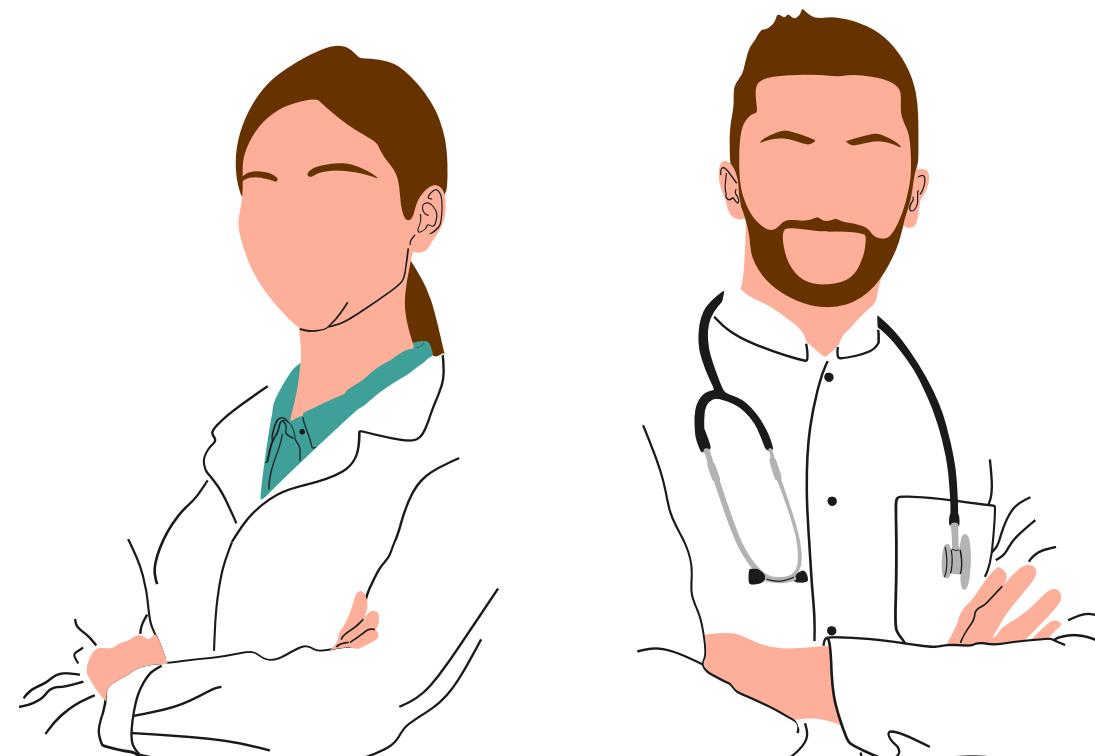
## BREAKTHROUGHS

Innovations in biotechnology have led to more efficient drug development and the rise of generic alternatives. AI-powered tools now assist in optimizing treatment strategies and predicting drug costs more accurately.



## CHALLENGES

Despite scientific progress, disparities in drug pricing remain a major barrier for underserved communities. Complex regulatory systems and monopolistic practices by pharmaceutical companies continue to hinder access to affordable medications.



# BREAKTHROUGHS IN MEDICAL TECHNOLOGY

- Generic statins like Atorvastatin have become widely accessible, offering a breakthrough in managing high cholesterol at a fraction of brand-name costs.
- Advancements in diabetes care, including generic Metformin, have significantly lowered treatment costs for one of the most common chronic illnesses.



# ETHICAL CONSIDERATIONS

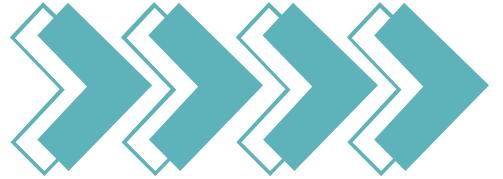
## AVOIDING ASSUMPTIONS

1. Avoid equating high drug prices with superior effectiveness or assuming generics are always less effective.
2. Acknowledge that cost data often reflects insured populations and may not represent the experiences of the uninsured.



## ENSURING CLARITY

3. Clearly distinguish between "cost" to the system and "price" paid by patients to avoid misrepresenting financial burden..



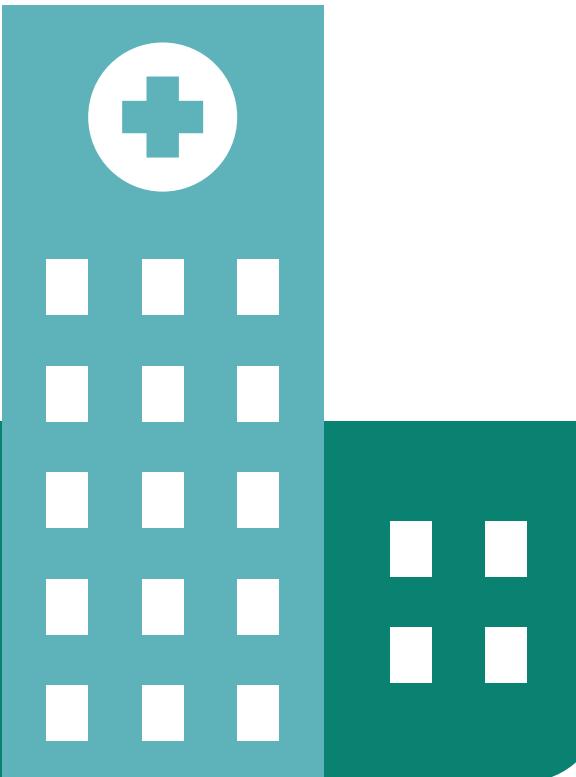
- Pricing Variability: Drug costs vary widely by region and insurance plan, complicating national trend analysis and introducing statistical noise (Ginsburg, 2019).
- Uneven Drug Comparisons: Medications serve diverse purposes—lifesaving vs. elective—making standardized cost comparisons difficult and potentially misleading (Shih et al., 2021)



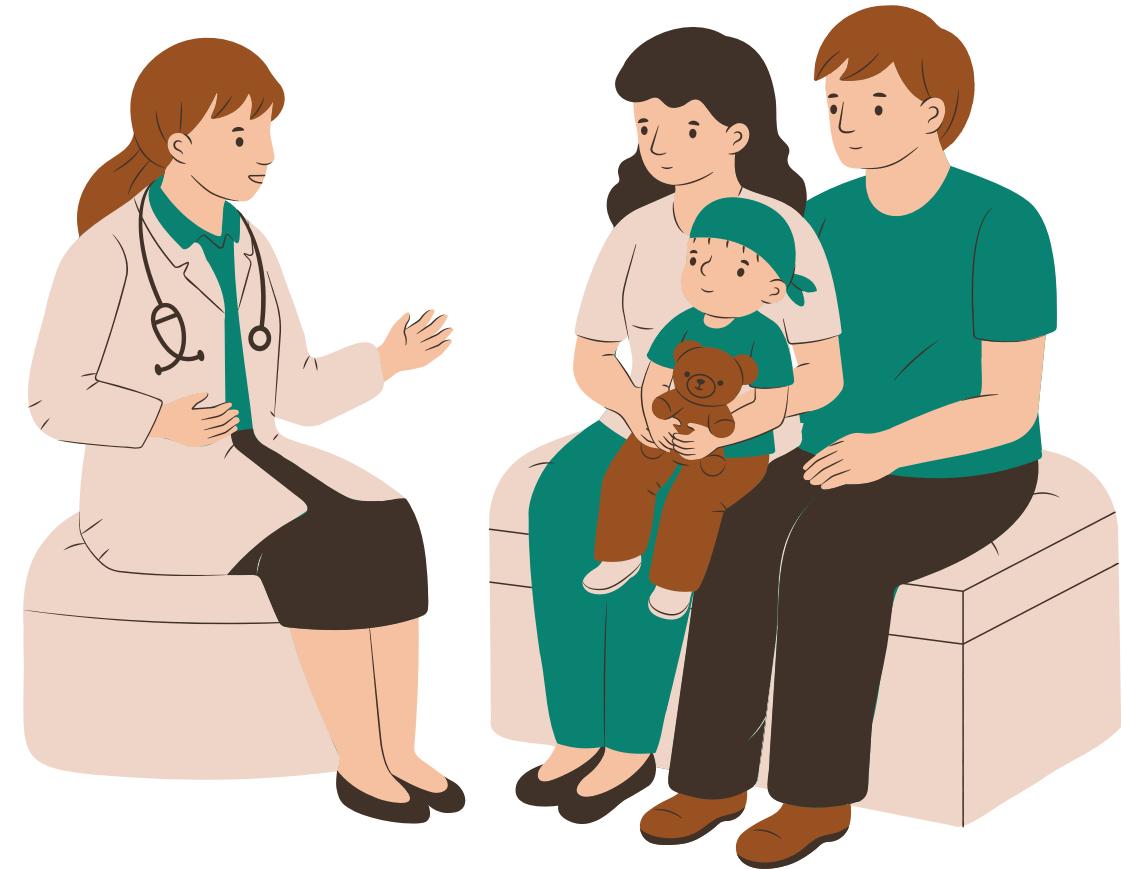
- Burden Disparities: Differentiating between patient out-of-pocket costs and broader healthcare system expenditures is essential for accurately assessing economic impact (Dusetzina et al., 2017).
- Market and Disease Skew: Economic forces and high-prevalence diseases like cancer and diabetes heavily influence pricing data, often overshadowing rare but impactful conditions.

## CHALLENGES/ISSUES

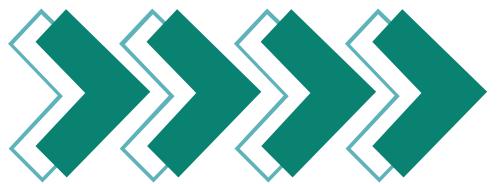
# HIGH-COST BRAND-NAME DRUGS DRIVING MEDICARE EXPENDITURES



Brand-name drugs like Eliquis and Revlimid topped Medicare Part D spending in 2023, highlighting their outsized impact on national prescription drug costs despite the existence of lower-cost therapeutic alternatives..



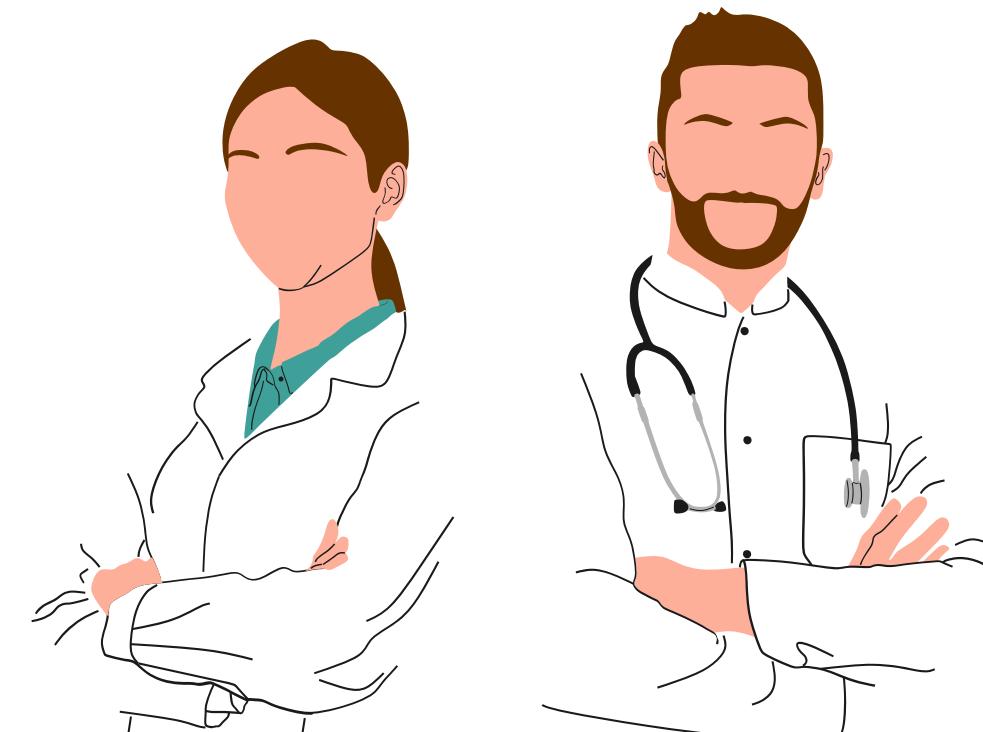
Descriptive statistics reveal that brand-name drugs not only exhibit higher average annual spending but also greater cost variability, reinforcing their role in destabilizing consistent and equitable medication access.



# COST-EFFECTIVE GENERIC ALTERNATIVES TO HIGH-SPENDING BRAND MEDICATIONS

## Overview 1

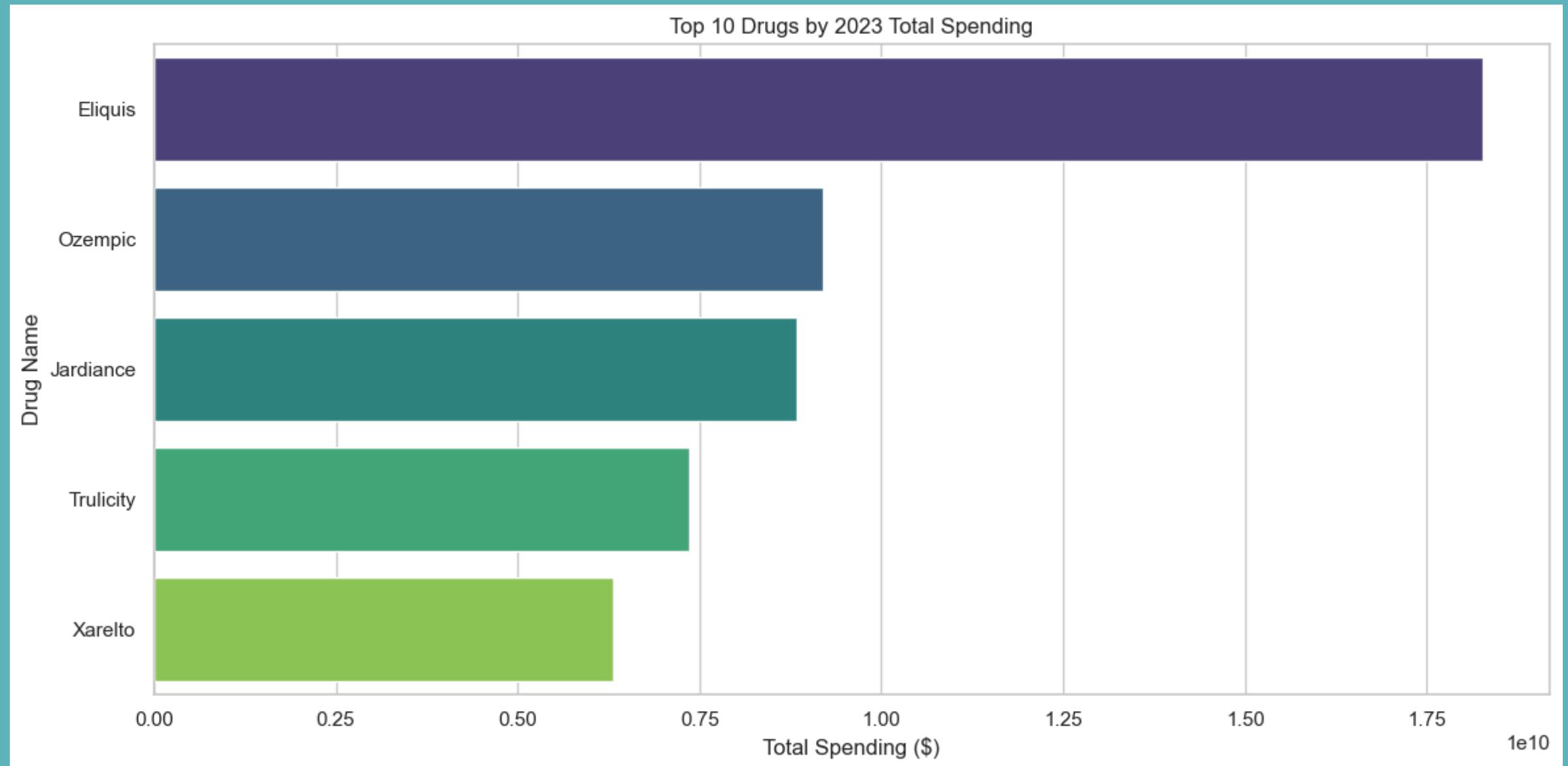
Generic equivalents for drugs like Atorvastatin (generic for Lipitor) and Metformin show consistently lower spending while maintaining comparable therapeutic effectiveness, highlighting their cost-efficiency.



## Overview 2

Comparative analysis reveals that patients and Medicare could save significantly by opting for generics such as Omeprazole over its brand counterpart Prilosec, without compromising clinical outcomes.

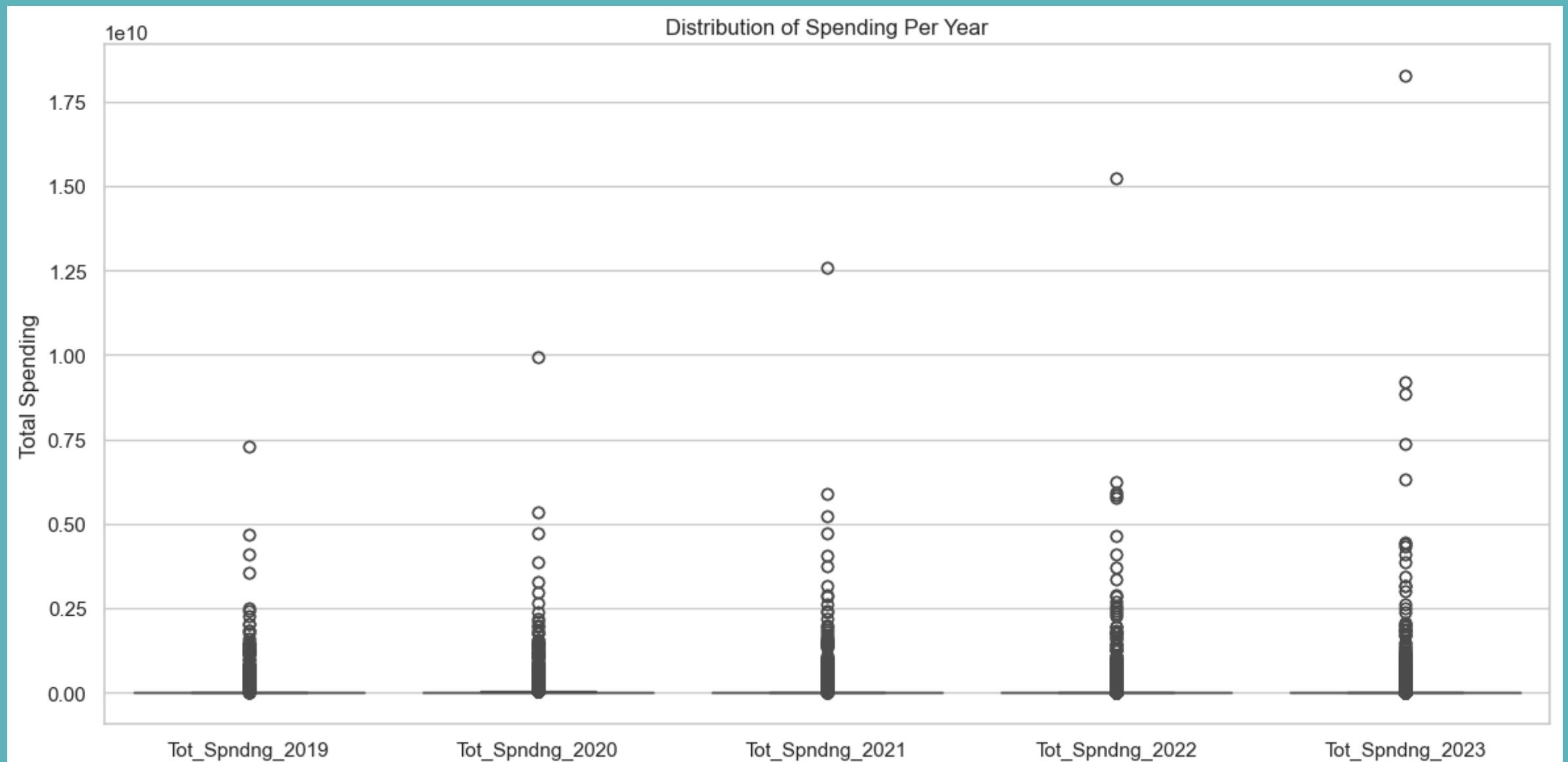
# Top 10 Drugs by 2023 Total Spending



- **Brand Dominance:** Eliquis (Apixaban), Ozempic (Semaglutide), and Jardiance (Empagliflozin) dominate Medicare Part D spending, with Eliquis alone exceeding \$18 billion, highlighting heavy reliance on high-cost brand-name drugs.
- **Lack of Generics:** These drugs are either under patent protection or have limited generic competition, which inflates pricing and hinders cost-saving substitution strategies.
- **Actionable Insight:** Promoting future generics for drugs like Ozempic and Eliquis could yield billions in savings, aligning with healthcare equity goals.



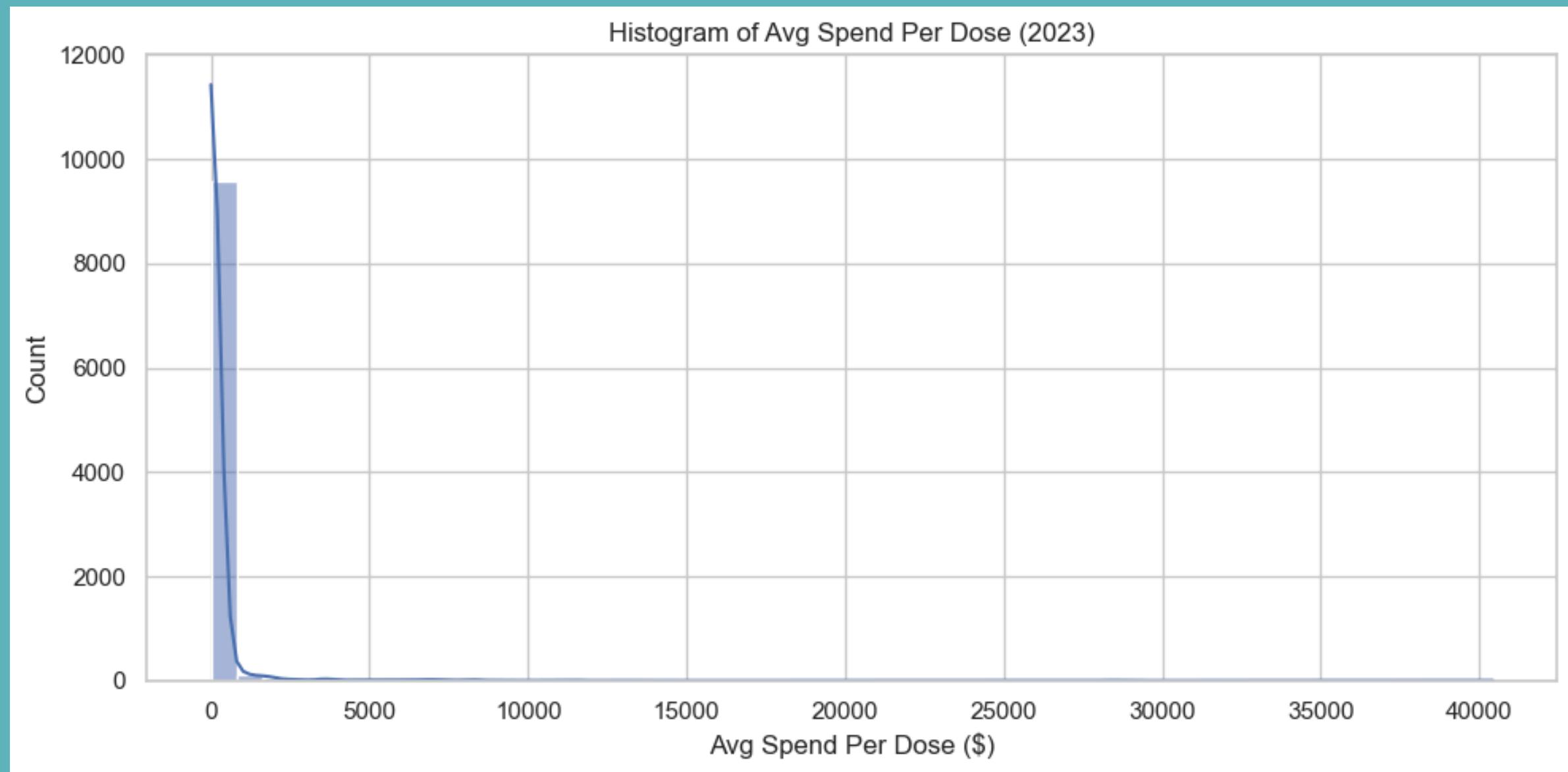
## . Distribution of Spending Per Year



- **Outlier Concentration:** Outliers such as Revlimid (Lenalidomide) and Humira (Adalimumab) skew total spending, reflecting the steep costs of specialty brand drugs.
- **Spread Growth:** The increasing spread from 2019–2023 suggests that expensive drugs like Ibrance (Palbociclib) are pushing up maximum spending values, widening economic disparity.
- **Reform Justification:** Targeting high-spending outliers like Revlimid with biosimilars or generics can improve affordability and reduce Medicare's financial load.



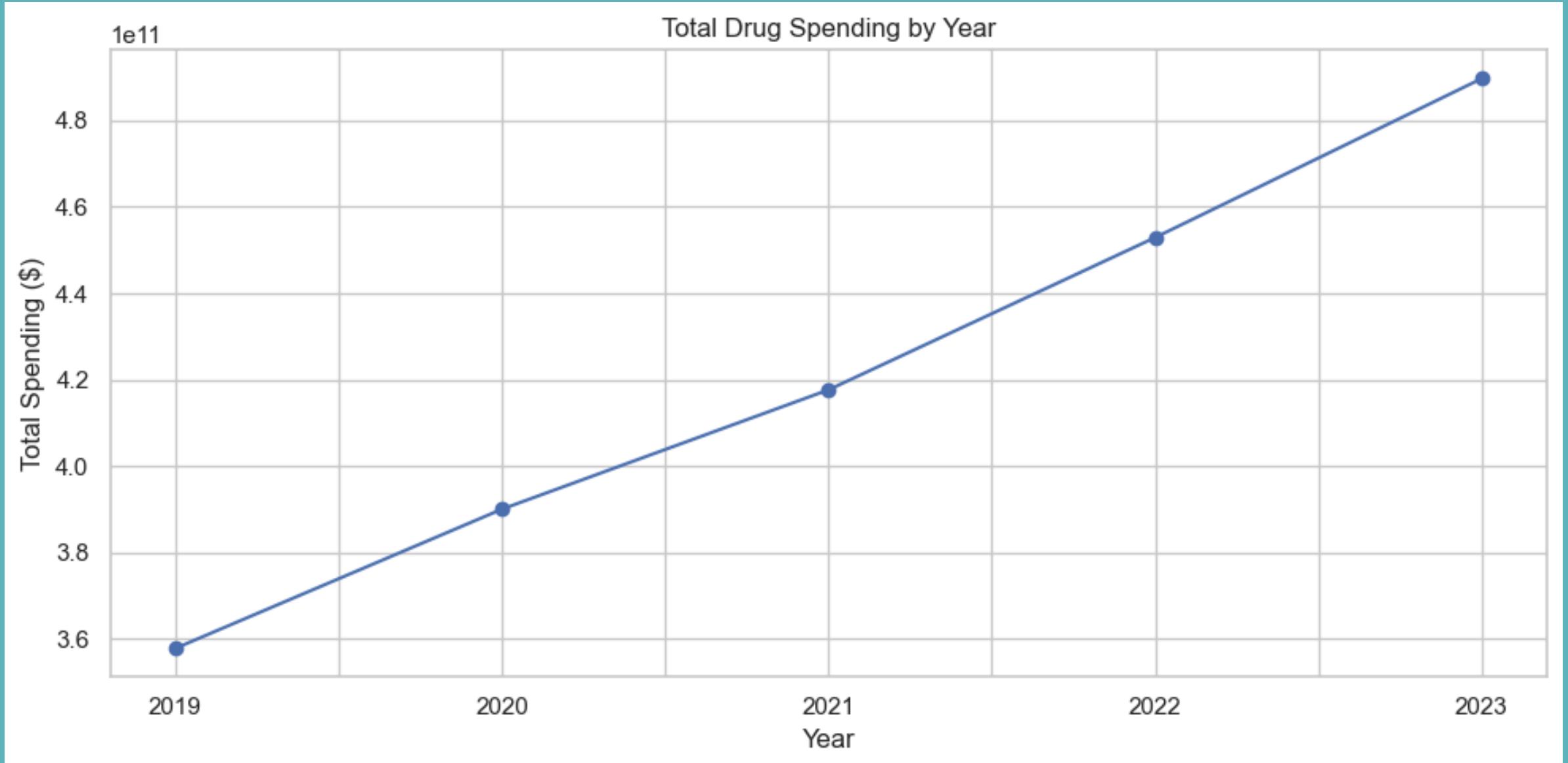
## Average Spend Per Dose



- **Right Skewed Costs:** While many generics such as Metformin (Glucophage) and Simvastatin (Zocor) remain below \$5/dose, drugs like Acthar (Repository Corticotropin) exceed \$40,000/dose.
- **Price Disparities:** This visual reinforces the contrast between affordable generics like Atorvastatin (Lipitor) and exorbitantly priced brands like Avastin (Bevacizumab).
- **Healthcare Barrier:** Ultra-expensive doses such as those of Sovaldi (Sofosbuvir) contribute to inequitable access, especially for underinsured populations.



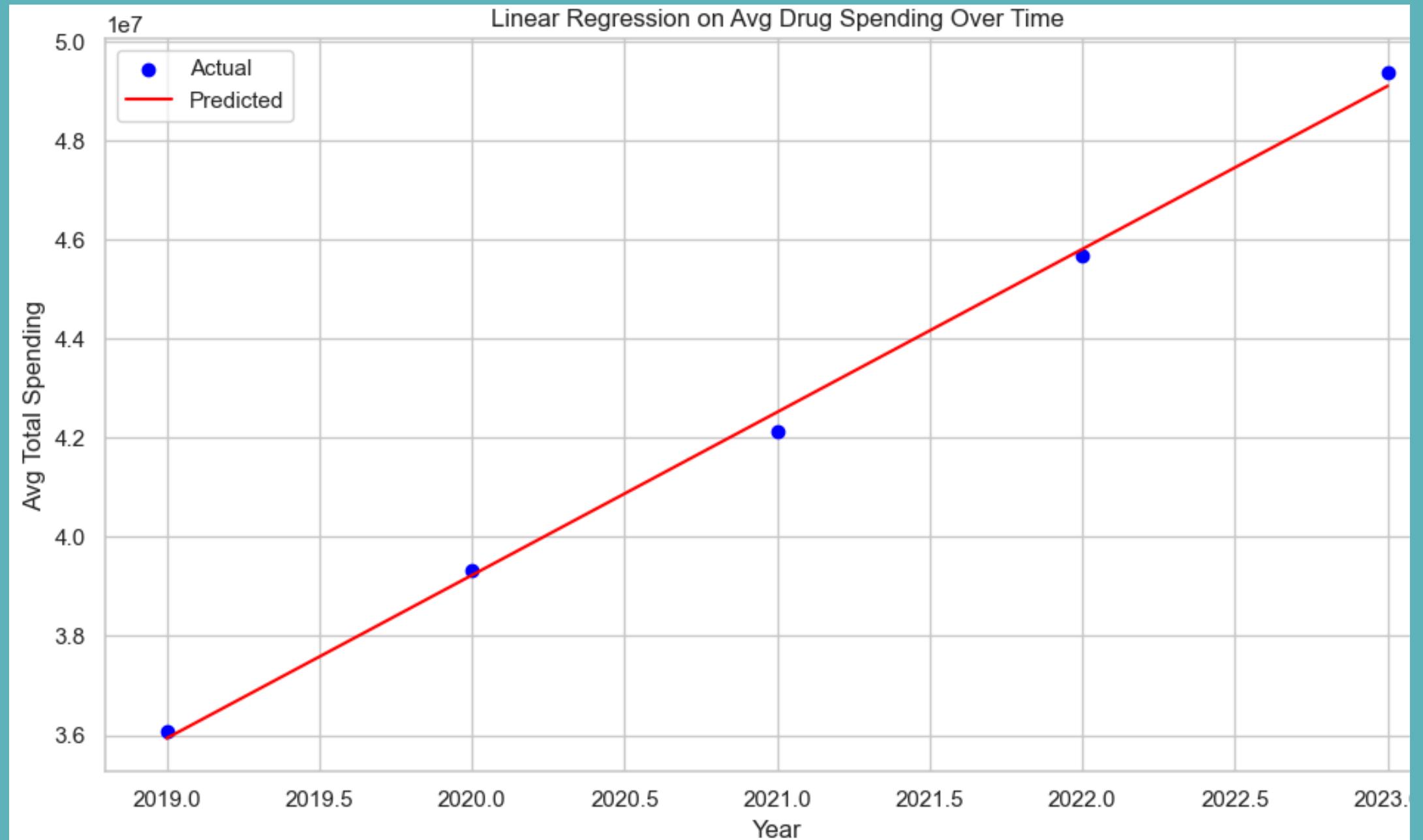
# Total Drug Spending by Year



- **Spending Growth:** Drugs like Humalog (Insulin Lispro) and Lantus (Insulin Glargine) show continuous growth in total spending, contributing significantly to year-over-year increases.
- **Brand-Driven Pressure:** Branded chronic-condition medications such as Trulicity (Dulaglutide) have seen sharp upticks in usage and cost, driving the upward trend.
- **Call to Action:** Substituting with biosimilars or lower-cost versions like Basaglar for Lantus could flatten this curve and relieve systemic cost strain.



## Linear Regression on Avg Drug Spending Over Time



- **Consistent Price Climb:** Drugs like Xarelto (Rivaroxaban) and Biktarvy (a combination HIV drug) demonstrate steady annual increases, captured well by the regression model.
- **Forecasting Insight:** The linear model indicates predictability in rising costs, especially for brand-only drugs with no generic equivalent.
- **Strategic Reform:** Prioritizing generic development for costly drugs like Biktarvy can proactively mitigate forecasted financial pressure.



## High-Spending Brand-Name Drugs Dominate Medicare Costs

### **Key Findings:**

- Eliquis, Ozempic, and Jardiance were among the top 10 most expensive drugs in 2023.
- Brand-name drugs, though fewer in prescription volume, account for a disproportionately large share of total spending.

### **Implications:**

- Immediate savings could be achieved through FDA-approved generics
  - Patent reform and increased market competition are crucial for reducing costs.

## Extreme Price Variability & Outliers Highlight System Inefficiencies

### **Key Findings:**

- Visuals show increasing interquartile ranges and outliers like Revlimid, Humira, and Ibrance.
- Annual spending disparities are widening, suggesting uncontrolled drug price inflation.

### **Implications:**

- Policies should target outlier drugs for cost containment or substitution.
- Specialty drugs must be ethically reviewed to avoid unjustified cost labeling while maintaining access.



## Generic Substitution Offers Major Cost-Saving Opportunities

### **Key Findings:**

- Generics like Simvastatin, Metformin, and Omeprazole are up to 90% cheaper than their brand counterparts (Zocor, Glucophage, Prilosec).
- Histogram and comparison tables show clear cost benefits without efficacy compromise.

### **Implications:**

- Increased generic prescribing can ease patient burden and reduce system-level waste. Educational initiatives are needed to overcome provider and patient resistance to generics.

## Price Forecasting Indicates Sustained Growth Without Reform

### **Key Findings:**

- Linear regression confirms annual drug spending is predictably increasing, especially among brand-only drugs like Xarelto and Biktarvy.
- Data shows that insulin drugs (Lantus, Humalog) continue to grow despite the introduction of biosimilars.

### **Implications:**

- Predictive modeling should guide budget planning for Medicare and Medicaid.
- Regulatory bodies must intervene to prevent unchecked price escalation and improve biosimilar adoption.



# Summary

## Insights:

- Brand-name medications like Eliquis, Ozempic, and Humira consistently lead Medicare drug spending—often without available or accessible generic alternatives.
- Our analysis confirms that generic drugs such as Simvastatin, Metformin, and Clopidogrel offer clinically equivalent, cost-effective options—yet remain underutilized.
- Predictive models and cost visualizations indicate that, without regulatory intervention, drug spending will continue to escalate, placing unsustainable burdens on patients and the healthcare system.

# Business Relevance

- This project directly supports the goal of identifying which medications impose the greatest financial burdens and provides actionable insights to help healthcare stakeholders make informed decisions.
- Findings reinforce the need for price transparency, generic substitution policies, and prescriber education to reduce waste and support equitable access to care.

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# Call To Action

- Equip providers and policymakers with these insights to advocate for fairer drug pricing, encourage informed prescribing, and reshape insurance design to prioritize cost-effective care.
- Continue data monitoring and model development to track pricing trends and guide proactive reform.



**THANK YOU FOR YOUR  
ATTENTION**

