**United States Prescription Drug Data and Transparency**

Group 2

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# I. Introduction

Prescription drugs in the United States are expensive and unless one researches specific drug prices, often it is not until they receive a bill that they are aware of the price. This is especially the case if someone must pay out of pocket due to not having insurance or if their insurance company does not cover their medication. Even if the insurance covers expenses only partially, the full price of the medication is still obscure. It would be convenient and helpful for one to know and compare prescription drug prices, amount covered by state Medicaid programs for medications, and answer the question, “Are we paying too much for prescription drugs?”

# II. Proposition

We propose to create an application that will make it simple for users to easily compare varying parameters of drugs in the United States. This application will provide transparency to the financial relationships between state Medicaid programs, pharmacy benefit managers, and the ingredient cost of a drug.

# III. User Functionality

Main functions the application will provide include the ability to display the average monthly or yearly costs, view the drug pricing over several years, compare OTC, prescription, brand name and generic options, and view which pharmacy classes are typically associated with which drugs. Clients will also be able to view various trends with a given product, such as the price of brand names, generics, product strength to price ratio, and prices available in a given location.

# IV. Data Sets

In order to support our functions, we require data set(s) to provide the cost of drugs, drug descriptions, insurance coverage costs, and location data. Public data sets found on the Internet that support our functions include Centers for Medicare and Medicaid Services (CMS) National Average Drug Acquisition Cost (NADAC) [1], the TTD Database [2], the Food and Drug Administration (FDA) National Drug Code (NDC) Database [3], and the CMS State Drug Utilization Data from 2014-2018 [4]. NADAC has information related to the product name with NDC as a unique identifier, strength and dosage, its average cost per unit, whether it is OTC or not, the generic version, and effective dates. The NDC database has additional information that we can query with a given NDC, such as the pharmacy class, the name of the substance, its proprietary and nonproprietary name, and dosage form. The TTD database can be used to associate some NDC codes with higher level medical conditions. State Drug Utilization Data includes state, drug name, NDC, number of prescriptions, and dollars reimbursed that can effectively provide the relationship between the cost of a drug from NADAC and the amount paid for by state Medicaid agencies for that drug.

# V. Queries

At the core of our application, we want users to graphically grasp the data and their relations. We will do so by complex queries, including:

* Historical trend charts and queries to assess the change in drug costs over time.
* Compare the price of brand name drugs with their generic equivalent.
* With the Statue Utilization Database, view the average invoice prices pharmacies pay for every medication and compare it to what the state is being charged. NADAC updates their data weekly, but we want to see
* Query if there is a trend when the most change occurs.
* What is the aggregate impact of all changes per month and per week?
* What type of drugs are affected most by the change and what is the aggregate impact of these specific drug price changes?
* Estimate how different the price paid is from the ingredient cost.
* Illustrate the large variation in markup state Medicaid programs are paying for different generic drugs in any given quarter.
* Query varying periods and compare brand-drug prices.

It is important to note that although estimation is possible, the precise spread pricing is not. Precise spread pricing occurs when health plans contract with pharmacy benefit managers (PBMs) to manage their prescription drug benefits, and the PBMs keep a portion of the amount paid to them by the health plans for prescription drugs instead of passing the full payments on to pharmacies. These PBM payments are not public, and therefore cannot be included in our calculations.

VI. Development Resources

We will be using Oracle to query our datasets, Ruby on Rails for the user interface, and C with CGI for the back-end language.

# VII. Conclusion

Developing an application that can aggregate medications by location would not only be a tremendous benefit to clients that need the product, but it would also be a helpful tool for insurance companies as a drug pricing benchmark in reimbursing medical claims that accurately reflect the prices that are paid by the retail community.

# References

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