

Name: Snehal Utage
ZID.: Z1888637
Course: Data Visualization CSCI 680
Prof.: David Koop
Date: 10/21/2020

PROJECT PROPOSAL

Topics covered: -

- I. Goal of Project
- II. Dataset used
- III. Background
- IV. Description of dataset
- V. Tasks
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I. Goal of Project-

To create a web based, interactive Data visualization for the selected dataset using D3 Framework.

II. Dataset Used -

Name – NADAC (National Average Drug Acquisition Cost)

- NADAC (National Average Drug Acquisition Cost) for Medicaid covered outpatient drugs
- Each dataset file will contain NADACs for approximately 20,000 to 25,000 National Drug Codes (NDC).

URL-

<https://data.medicaid.gov/Drug-Pricing-and-Payment/NADAC-National-Average-Drug-Acquisition-Cost-/a4y5-998d>

III. Background -

How Medicaid agencies reimburse the pharmacies and how drug prices are established

- The State Medicaid agencies reimburse the pharmacy providers for covered outpatient drugs that are prescribed and dispensed to Medicaid beneficiaries.
- The payment consists of two parts:
 - 1) reimbursement for drug ingredient costs, and
 - 2) reimbursement for the cost of dispensing.

- In general, federal regulations require that Medicaid programs reimburse for drug ingredient costs at no more than the agency's best estimate of the acquisition cost (EAC) for a drug.
- Many Medicaid reimbursement methodologies were used - Average Wholesale Price (AWP), Wholesale Acquisition Cost (WAC), Average Sales Price (ASP), and Direct Price (DP), but each had limitations.
- So, a single national pricing benchmark based on average drug acquisition costs was established. It provided state Medicaid agencies with a better estimate of prices paid by pharmacies for drugs because it was based upon actual drug purchases.
- This approach to drug ingredient price determination provides greater accuracy and transparency in how drug prices are established and is generally more resistant to manipulation.
- CMS with the help of Myers and Stauffer LC developed this benchmark by conducting surveys of the pharmacies and calculated NADAC.
- The National Average Drug Acquisition Cost (NADAC) is the approximate invoice price pharmacies pay for medications in the United States.
- The NADAC data is calculated by the Centers for Medicare and Medicaid Services (CMS).
- The NADAC is a simple average of the drug acquisition costs submitted by retail community pharmacies
- On a monthly basis, Myers and Stauffer LC will collect acquisition cost data from a random sample of pharmacies. Pharmacy entities surveyed include independent and chain retail community pharmacies in the United States.
- Pharmacies are requested to voluntarily submit invoices on all covered outpatient drug purchases made from all wholesalers or manufacturers during the specified time period.
- Information requested through the survey consists of a minimum of the following: NDC, Unit Price Paid, Invoice Date, Quantity Purchased.
- This data gathered is used in calculating the NADAC. Prior to NADAC calculations, the data are grouped based on active ingredient(s), strength, dosage form, and route of administration. The data is also classified according to its drug category as either single source (S), innovator multiple source (I), or non-innovator multiple source (N).
- S/I are the brands drugs and the NADAC for 'N' products is referred to as generic drug NADACs.
- NADAC file updates occur on a weekly and monthly schedule. The NADAC reference file is publicly available on CMS' Medicaid website, Medicaid.gov.
- Each NADAC reference file update contains a full listing of covered outpatient drug products' NDCs with assigned NADACs.

IV. **Description of Dataset-**

NADAC – It is a dataset of medicine costs in the United States.

Data fields –

URL - <https://www.medicaid.gov/medicaid-chip-program-information/by-topics/prescription-drugs/ful-nadac-downloads/nadacdatadefinitions.pdf>

Data Fields of the dataset along with the type of each field: -

1. National Drug Code (NDC) Description:

Description: Identifies the drug name, strength, and dosage form of the drug product.

Type: Categorical

2. National Drug Code (NDC)

Description: The National Drug Code (NDC) is a numerical code maintained by the Food and Drug Administration (FDA) that includes the labeler code, product code, and package code. The NDC is an 11-digit code.

Type - Categorical

3. NADAC Per Unit:

Description: The National Average Drug Acquisition Cost per unit.

Type – Quantitative

4. Effective Date:

Description: The effective date of the NADAC Per Unit cost.

Type: Quantitative

5. Pricing Unit:

Description: Indicates the pricing unit for the associated NDC ('ML', 'GM' or 'EA').

Type: Categorical

6. Pharmacy Type Indicator:

Description: The source of pharmacy survey data used to calculate the NADAC.

'C/I' - data was collected from surveys of Chain/Independent pharmacies. Other pharmacy type indicators are not used at this time.

Type - Categorical

7. OTC –

Description: Indicates whether or not the NDC is for an over the counter (OTC) product ('Y' or 'N').

Type - Categorical

8. Explanation Code:

Description: Codes that pertain to how the NADAC was calculated; details see the above URL.

Type: Categorical

9. Classification for Rate Setting:

Description: Indicates whether the NDC was considered any one of below for the NADAC rate calculation process.

B - brand

G – generic

B-ANDA - If the NDC was considered brand ('B') and approved under an Abbreviated New Drug Application (ANDA), the indicator is shown as ('B-ANDA').

Type: Categorical

10. Corresponding Generic Drug NADAC Per Unit:

Description: The NADAC for the corresponding generic drug. The corresponding generic drug NADAC columns will not be populated when 1) the NDC is not a multiple source brand drug, or 2) there is no NADAC for the corresponding generic drug

Type: Quantitative

11. Corresponding Generic Drug Effective Date:

Description: The effective date of when the Corresponding Generic Drug NADAC Per Unit is assigned to a multiple source brand drug NDC. This date may not correspond to the NADAC effective date for the generic drug due to the method by which the corresponding generic drug NADAC effective date is assigned. The corresponding generic drug NADAC effective date is the latter of the following dates: a) Date of the NADAC reference file upon which the corresponding generic drug NADAC first appears,

b) The current corresponding generic drug NADAC effective date plus one day – one day is added to the previous date so that there are no overlapping rate segments

c) The NADAC Effective Date for the generic drug group. This data assignment process is necessary to eliminate the potential for applying corresponding generic drug NADACs to past claims.

Type: Quantitative

12. As of Date:

Description: NADAC price for drugs applicable till this date

Type: Quantitative

V. Task –

How the common Over-the-counter drugs prices changed over time?

VI. Ideas for Visualization -

Get a list of the common OTC covered under Medicaid and get the list of those drugs with OTC=Y (no prescription required). Combine those into categories – Analgesics, Cold cough & Antihistamines, Anti-diarrheal, Sore throat, Vitamins. These are the commonly required drugs.

1. Show the packed bubble chart with the average of NADAC prices of drugs included in each category. Bubble size can show the price changes, the labels shows the year and color mark shows the category in which the drug is.
2. Can show the stacked bar charts with each bar having the stack for each category, then further show the line chart that shows the trend for each drug in that category.

Partial vis screenshot shown below – Visualized using tableau

