Vaccine Adverse Event Reporting System (VAERS)

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Introduction

- The Vaccine Adverse Event Reporting System (VAERS) was created by the Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC) to receive reports about adverse events that may be associated with vaccines.
- No prescription drug or biological product, such as a vaccine, is completely free from side effects.
- Vaccines protect many people from dangerous illnesses, but vaccines, like drugs, can cause side effects, a small percentage of which may be serious.
- VAERS researchers apply procedures and methods of analysis to help us closely monitor the safety of vaccines.

Dataset

- We have 3 csv files that have different data required for the analysis.
    1. The VAERS data file that contains patient details like, age, gender, previous medical history, allergies, symptoms and so on. – 507MB
    2. The VAERS VAX file provides vaccine information like the vaccine name, lot number, type so on. – 46MB
    3. The VAERS Symptoms file provides list of all the symptoms coded in terms utilizing the MedDRA (Medical Dictionary for Regulatory Activities) dictionary. – 62MB
- These three tables are linked with the VAERS_ID as a primary key.

Analysis

- We can look for patterns, trends, coincidences, match descriptions of symptoms by similarity, correlate to patient location, age, sex, etc, and vaccine type, route, etc.
- The textual information provides room for natural language processing / analysis.
- We can use:
  - MinHash algorithm to find similarities between the symptom reports
  - Frequent itemsets to determine what are the most common symptoms/problems that people are facing with certain vaccines.
  - Building a dynamic visualizations using Plotly to show how the patterns depending on geographical regions and other factors.