Predictive Modeling of Opioid Prescription Fraud by CMS Providers

DATA606 Capstone Project
William Rubin – Spring 2020
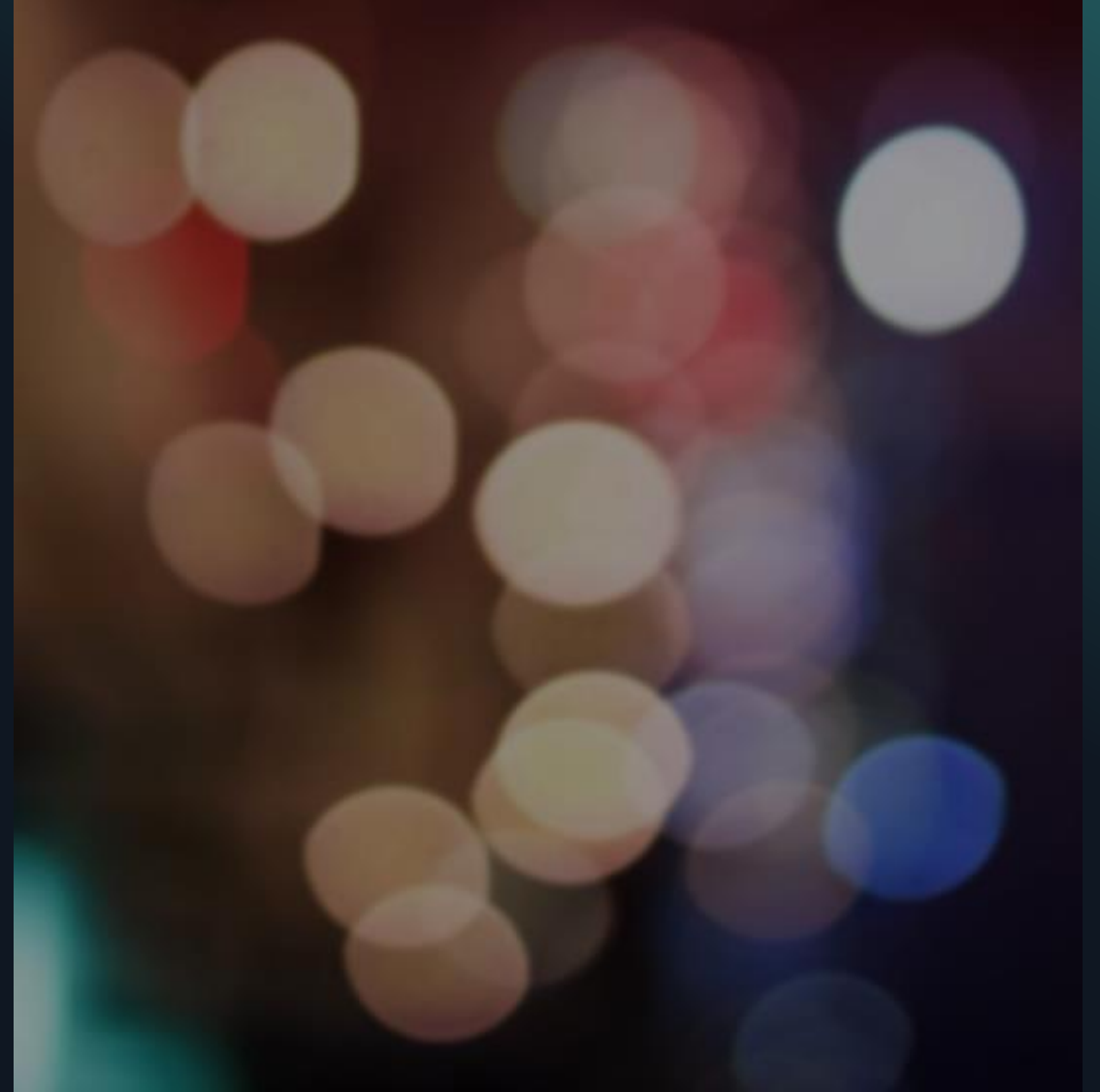
PROBLEM

Opioid Epidemic Overview

o Powerful / highly effective medicines used for pain management, initially touted as non-habit-forming

o Over time proven to lead to addiction, overdose, and death

o Declared public health emergency by HHS in 2017

o Over 46,000 opioid-related deaths in 2017 (an average of around 130 people per day)

o Estimated 11.4 million people misuse prescriptions

o CDC reports opioid prescription rate per 100 people in U.S.
  - 2012 – Reached peak at 81.3
  - 2017 – Last publicly reported at 58.7

o Fostered environment for unscrupulous providers to profit from opioid over-prescription or encourage over-use

PROJECT GOAL

○ Assist efforts to prevent opioid over-prescription and reduce negative impacts to patients / healthcare system

○ Identify providers / organizations formally charged, plead guilty to, or convicted of opioid-related fraud

○ Evaluate prescription patterns of identified providers / organizations to establish key indicators of potential fraudulent practices

○ Develop predictive model to detect previously unidentified occurrences of potential prescription fraud

DATA SOURCES

① Department of Justice (DOJ) Press Releases

Health Care Fraud related press releases which reference opioids or opioid-related terms (such as specific drug names) will be mined to extract provider / organization names of those formally charged, plead guilty to, or convicted of fraudulent activity.

② CMS National Provider Identifier (NPI) Registry

CMS National Plan and Provider Enumeration System (NPPES) contains unique identifiers (NPI) for all registered Medicare / Medicaid eligible providers and provides mechanism to accurately trace fraudulent provider / organization names to CMS Public Use Files.

③ CMS Public Use Files (PUF)

Medicare Provider Utilization and Payment Data: Part D Prescriber Public Use Files contain records of prescription drugs prescribed by providers which have been paid for using the Medicare Part D Prescription Drug Program; will be used to evaluate and analyze prescription trends exhibited by CMS Providers.

THANK YOU!

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GitHub:
DATA606 Delivery Repository

YouTube:
DATA606 Video Presentations