Is your doctor overprescribing?

On Jan 23rd 2018, New York City filed a lawsuit against the manufacturers and distributors of commonly-abused prescription painkillers, with mayor Bill de Blasio stating that “more New Yorkers have died from opioid overdoses than car crashes and homicides combined in recent years” [1]. The detrimental effects of prescription opioids span far beyond NYC, however, as the Opioid Epidemic claimed more than 64,000 lives in 2016, and in some states, including North Carolina, doctors have filled out more painkiller prescriptions than people [2]. In a recent report, the Boston Medical Center found that 1 in 12 U.S. physicians have accepted payments from pharmaceutical companies related to opioids. The top 1% of doctors received more than $38M in payouts from ‘big pharma’[3].

Over-prescription is not a new phenomenon. Adderall sales have exploded in the past decade, with prescriptions rising from 9 million in 2005 to 16 million in 2012, prompting the New York Times to call the young adult demographic “Generation Adderall’ [4]. Antibiotics are another frequently prescribed drug, despite over a quarter of doctors saying that antibiotics are often administered even though they will do no good, and this leads to waste in the healthcare system [5].

Your task is to determine which providers are highly likely to be over-prescribing drugs to their patients and characterize or classify the anomalous providers’ behaviors. Some providers may be over-prescribing addictive painkillers for monetary gain, while others may be too lenient and overprescribe all types of drugs. The prescription data per is listed per provider in the accompanying file “data.csv”. Please explore or visualize the given information to determine the best techniques to approach the dataset and justify your results. The attached data is synthetic but was constructed based on a real data in a related domain.

Requirements and Deliverables:

1. Describe and justify your methods.
2. Communicate what you have found.
3. Include your code such that we can reproduce you research by running a script, Jupyter notebook, jar file, etc.

[1] <https://www.wsj.com/articles/new-york-city-sues-companies-over-opioid-abuse-1516734990>

[2] <https://www.vox.com/science-and-health/2017/3/23/14987892/opioid-heroin-epidemic-charts>

[3] <http://www.wbur.org/commonhealth/2017/08/09/opioid-money-study>

[4] <https://www.nytimes.com/2016/10/16/magazine/generation-adderall-addiction.html>

[5] <https://www.cbsnews.com/news/doctors-still-overprescribing-drugs-antibiotics/>