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IST719

Understanding Opioids

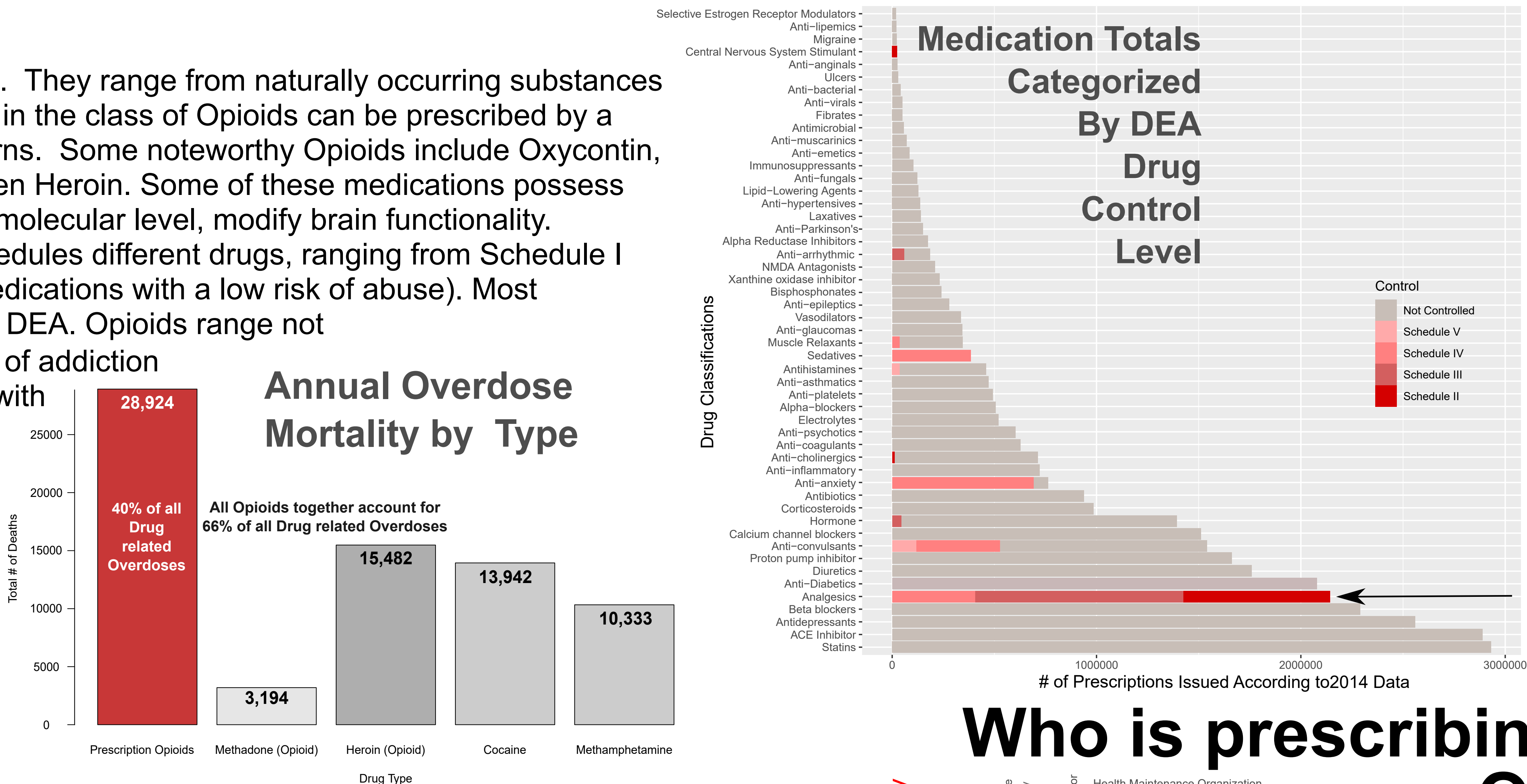
The first step to addressing rampant addiction

Morphine was the first best known Opioid which grew to predominance in the years leading into the American Civil War. Opioids have been a part of the American pain management fabric for well over a century. Things changed in the late 1980's when the drug Oxycontin was introduced and claimed nearly zero addictive properties. Without understanding the risks, this and other highly addictive opioids were prescribed liberally. This set conditions for saturation of the market with regular access to Opioids, misuse, addiction and overdose. Understanding the scope of this problem starts with understanding Opioids. After understanding comes the opportunity to mitigate what the CDC calls an epidemic.

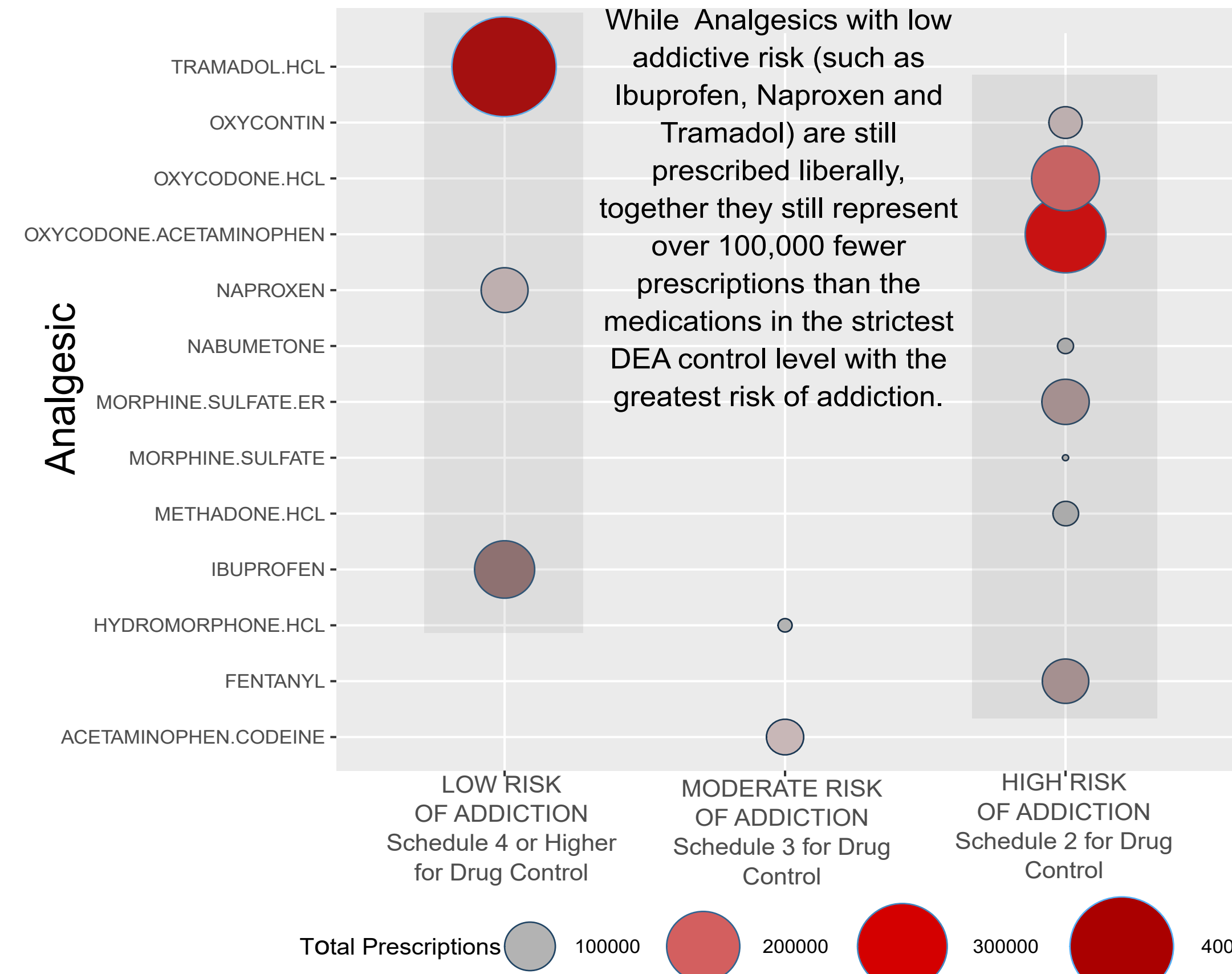
What are Opioids?

Opioids are a class of drugs used to reduce pain. They range from naturally occurring substances to fully synthetic drugs. Most of the medications in the class of Opioids can be prescribed by a medical provider for a number of different concerns. Some noteworthy Opioids include Oxycontin, Morphine, Vicodin, Methadone, Fentanyl and even Heroin. Some of these medications possess significant risks of abuse and addiction and at a molecular level, modify brain functionality. Because of this risk, the DEA categorizes or schedules different drugs, ranging from Schedule I (highly addictive illegal drugs) to Schedule V (medications with a low risk of abuse). Most medication is not controlled or scheduled by the DEA. Opioids range not only a range widely in application but also levels of addiction and span of DEA controls. The class of Opioids with the greatest risk of addiction are Analgesics.

The CDC notes that annually, Prescription Opioids (Analgesics) are responsible for more Drug Overdose Deaths than Cocaine and Methamphetamine's combines. Including all Opioid Overdose Deaths (Prescriptions, Heroin and Methadone) account for nearly 70% of deaths. This is a testament to the highly addictive nature of this drug.

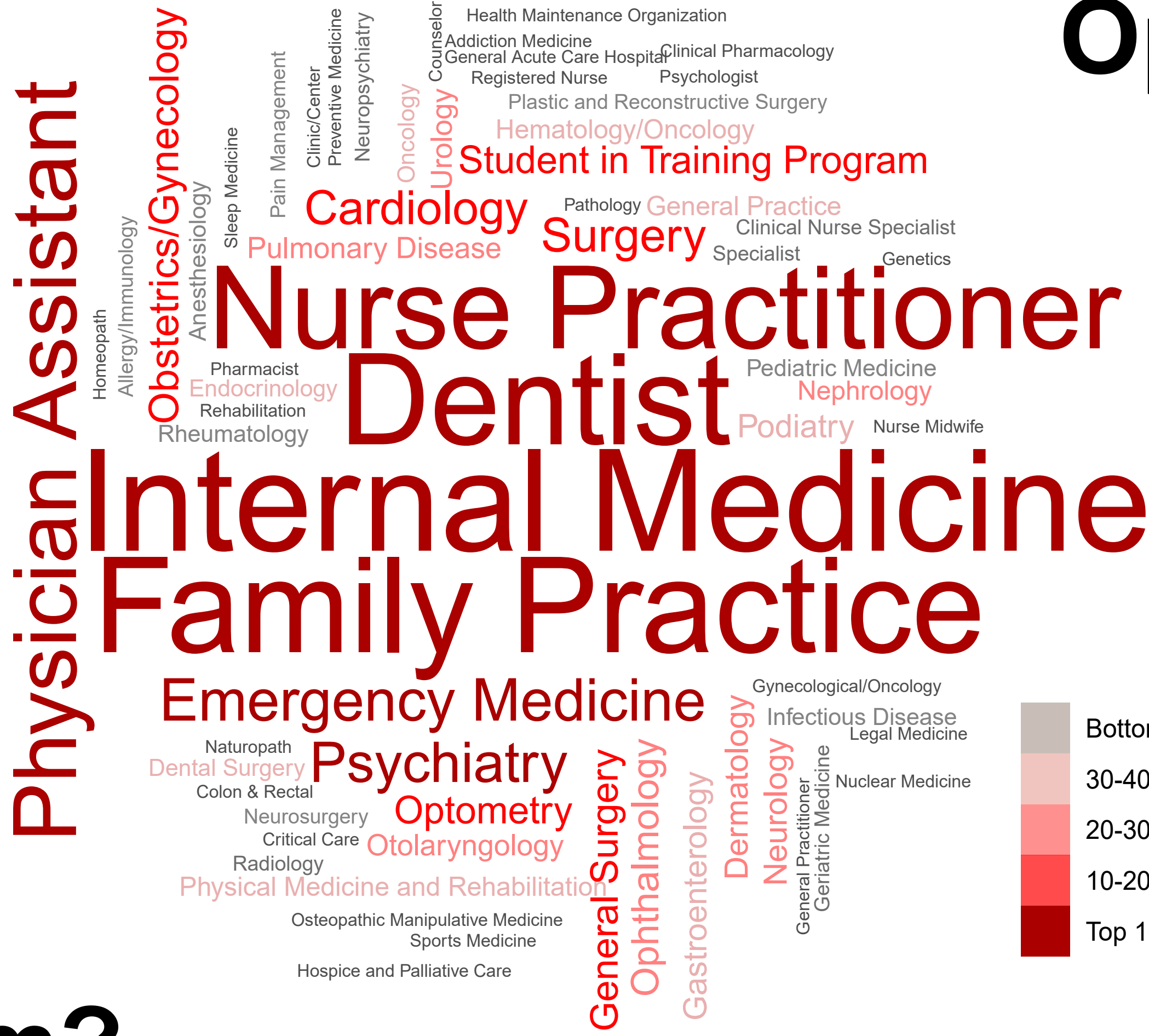


This class of drugs, Analgesics, represents key Opioids such as Oxycontin, Fentanyl, and Methadone and is synonymous with the conceptions of Opioids and the risk of addiction. Yet with that risk, they are still highly prescribed



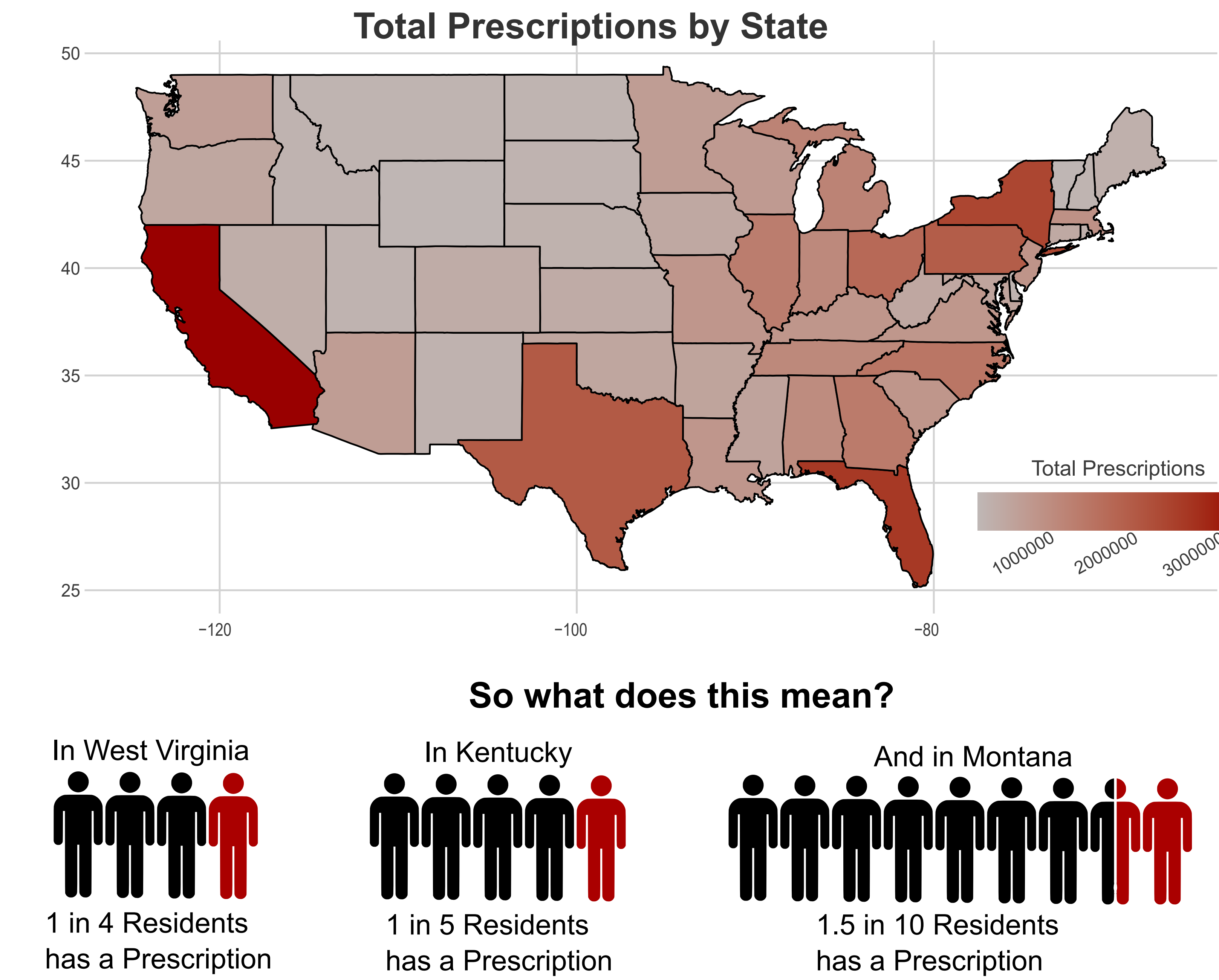
Analgesics: Rate of Prescription related to Risk of Addiction

The range of medical specialties prescribing Opioids to their patients is prolific. Within this dataset, 68 unique specialties prescribed the controversial class of drugs: Analgesics. Additionally, they are prescribing the medications with higher risks of addiction more frequently than those with lower risks

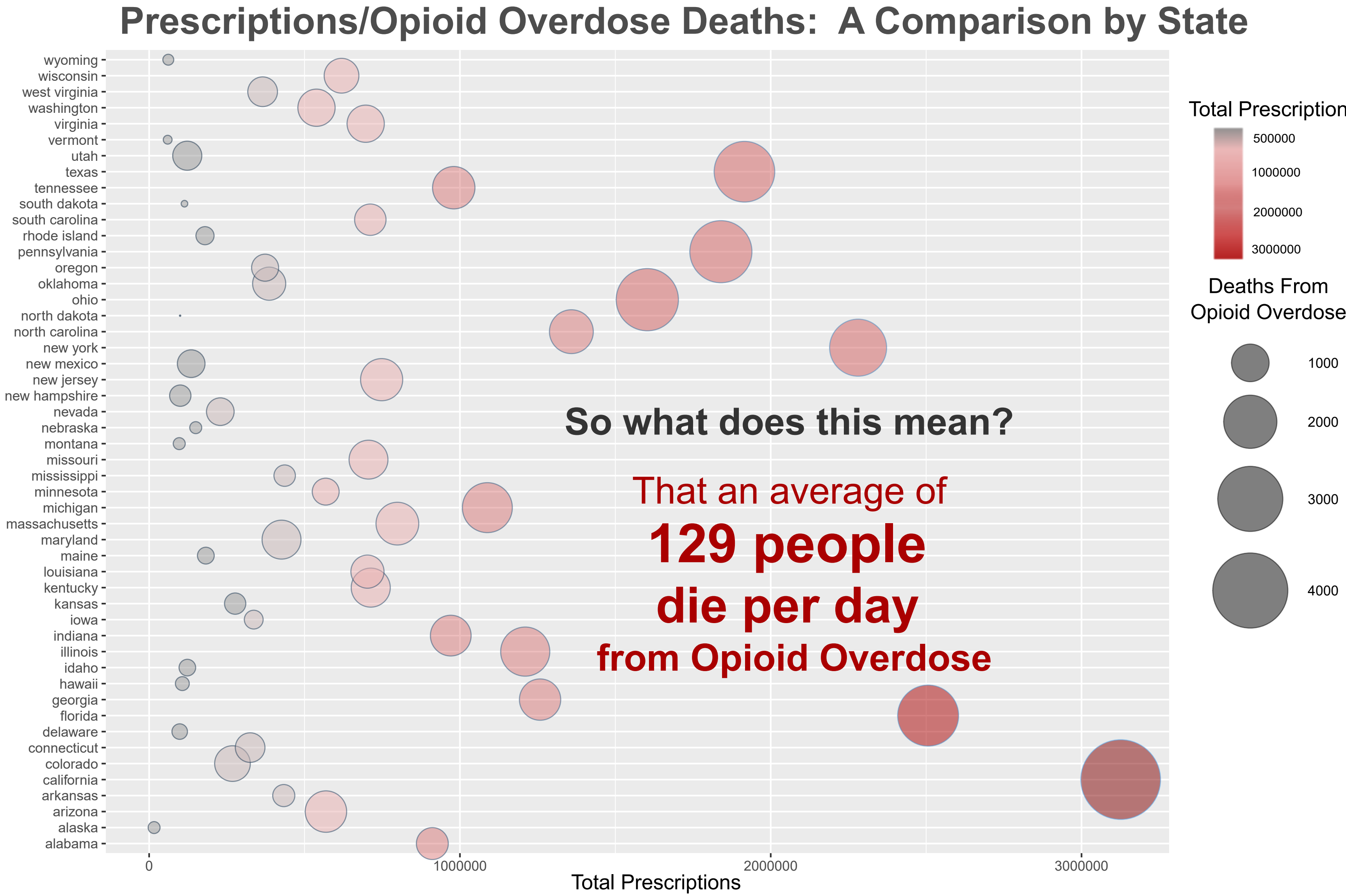


Quantities of Analgesics Prescribed by Specialty

Where are Opioids a Problem?



Opioids have become pervasive in the medical community, evidenced by the plethoric volume of prescriptions across the country. The CDC believes that the third Wave of Opioid Overdose Death related to abuse and addiction is ongoing with highest numbers ever in 2019.



Dataset: The US Opiate Prescriptions Dataset contains summaries of prescription records for 250 common opioid drugs written by 25,000 unique licensed medical professionals in 2014 in the United States for citizens representing a cross section of providers and medications. Dataset available at kaggle.com
2 x sheets: $((261 \text{ COL} * 4) * (25052 \text{ ROW} / 100)) = 261,010$

Data Preparation and Manipulation: Data cleaning and sub setting was completed in Excel. Plots were made in R using ggplot, wordcloud, and Barplot. R libraries used included: ggthemes, dplyr, ggplot2, wordcloud, Tidyverse, and RColorBrewer. Enhancements were made in Inkscape

Additional Sources:
2019 CDC Drug Surveillance Report (<https://www.cdc.gov/opioids/data/analysis-resources.html>)
Drug Enforcement Agency Drug Scheduling (<https://www.dea.gov/drug-information/drug-scheduling>)

