

# Public Health Data Challenge - Combating the Opioid Crisis

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# Purpose, Background and Strategy

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## Purpose

Opioids are a leading factor US deaths every year. Most deaths are caused by overdoses and are not intentional . Finding effective solutions that reduce death by opioid overdose, will reduce opioid deaths, drug deaths, and overall death rate in the US.

## Background

Opioid drug abuse has killed approximately 49,000 Americans in 2017, greater than car accident deaths, which makes it the #1 leading cause of drug overdose deaths. In 2016, there were 63,632 drug overdose deaths in the United States. Opioids accounted for 66.4% (42,249) of those deaths.

## Strategy

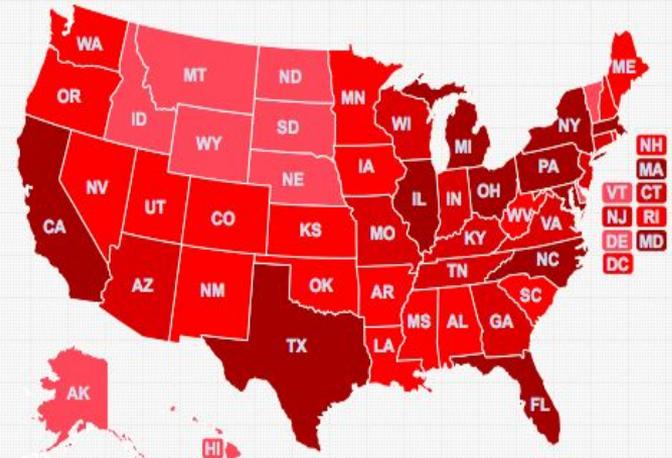
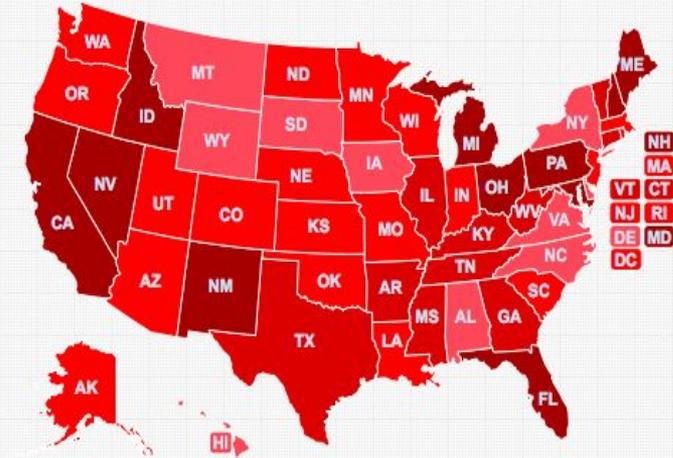
We will gather data of opioid deaths in different states and compare the crude rate (# of deaths per 100k people) in each state from 2015 to 2016. Based on which states had the biggest decrease in deaths in 1 year, we can recommend some of their methods for other states.



# US Map of Opioid Deaths in 2015 vs 2016

2015

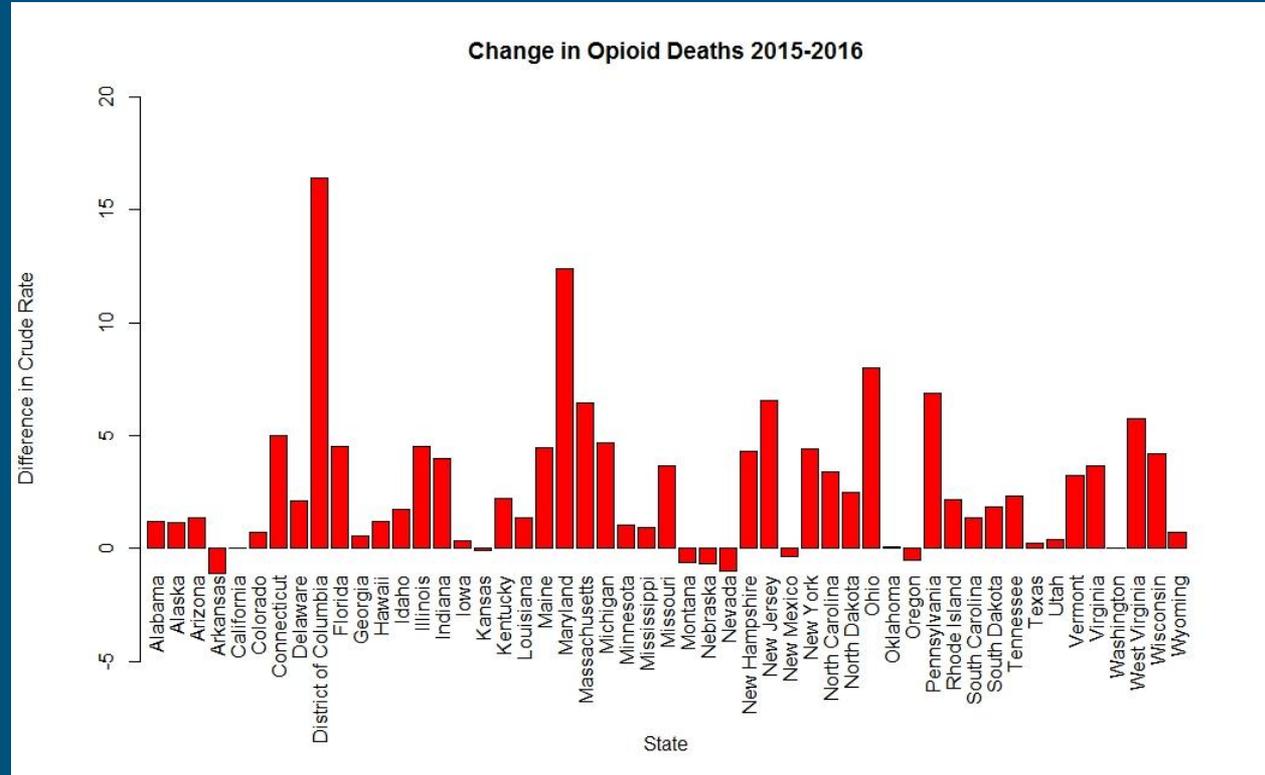
2016



States like New Mexico and Idaho got lighter(better) but states like Iowa or Texas got darker(worse).

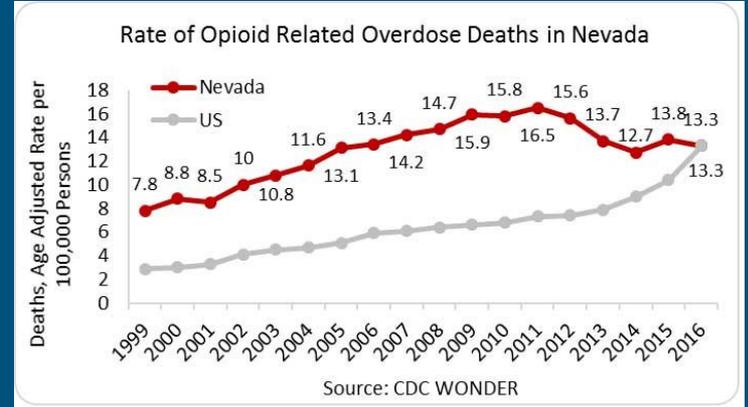
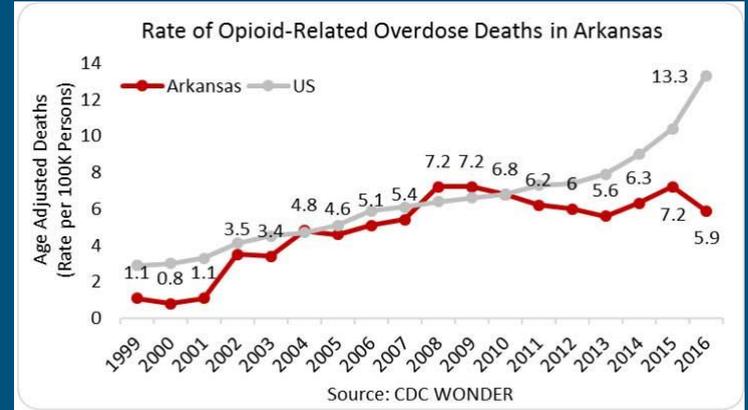
# Change in Crude Rate of Opioid Deaths per State from 2015-2016

- Based on the graph we made with the R programming language using data collected from the CDC WONDER dataset, the states that had a decrease in crude rate of opioid deaths from 2015-2016 were Arkansas, Kansas, Montana, Nebraska, Nevada, New Mexico and Oregon
- D.C. and Maryland had the biggest upward spikes in opioid deaths between the two years



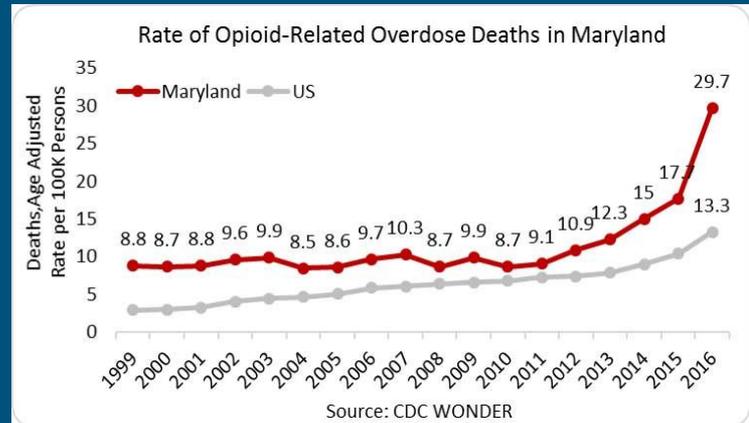
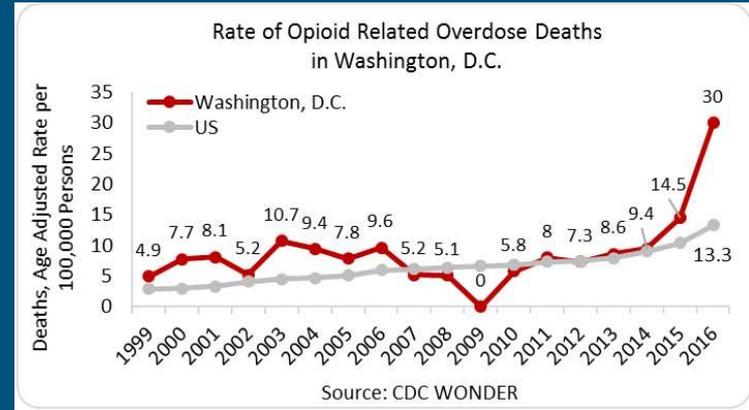
# Possible Reasons for Less Deaths

- In 2015, Arkansas passed the Arkansas Prescription Drug Abuse Act, which gave the Department of Health permission to determine if a patient is being prescribed opioids by more than 3 physicians within a 30 day period and required opioid prescription guidelines for emergency departments
- In 2015, Nevada passed SB 259, known as the Good Samaritan Drug Act, which prevents one from being prosecuted for many narcotics-related offenses when one seeks medical assistance for drug overdose



# Possible Reasons for More Deaths

- SAMHSA provided grants to only 22 states to provide naloxone to first responders and treatment providers.
- Growth in illegal use of opioids such as fentanyl and heroin laced with fentanyl.



# 2 Proportion Z Test of Arkansas

Let  $p_1, p_2$  = proportion of deaths due to opioid overdose in Arkansas in 2015, 2016

$$p_1 = 208/2978204$$

$$p_2 = 175/2988248$$

$$H_0: p_1 = p_2$$

$$H_a: p_1 > p_2$$

$$\alpha = .05$$

Assume independence

$$z = 1.7192$$

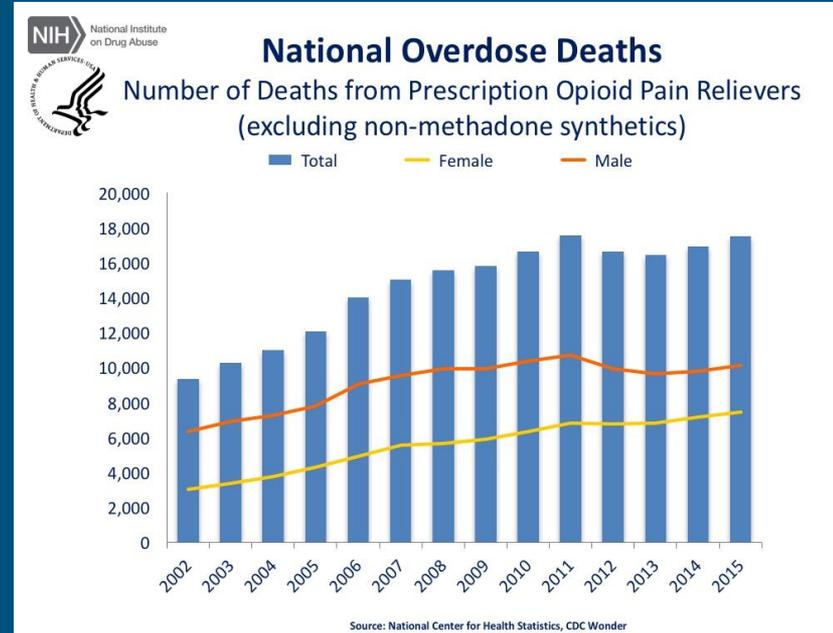
$$p\text{-value} = 0.0428$$



Since  $p\text{-value} < \alpha$ , we reject the null hypothesis. There is sufficient evidence to conclude that the proportion of deaths due to opioid overdose in Arkansas is significantly lower in 2016 compared to 2015.

# Conclusion/Application

- States such as Washington D.C. and Maryland, who had spikes in opioid-related deaths from 2015-2016 did not monitor if patients were being prescribed opioids from multiple physicians
- Multiple opioid prescriptions can lead to overdose and eventually death
- States such as Arkansas and Nevada, which saw a decrease in opioid-related deaths from 2015-2016, passed laws relating to monitoring and limiting opioid prescriptions
- If patients are limited to one opioid prescription at a time and are encouraged to seek medical assistance, they are far less likely to die due to overdose
- Our recommendation would be to create laws that limit the amount of opioid based drugs prescribed, thus reducing deaths due to opioid overdose



Fentanyl can cause side effects similar to those of other opioid drugs, including heroin, OxyContin, or morphine. However, since fentanyl is between 50 and 100 times more potent than morphine, the side effects may be more intense, set in faster, or last longer.



## Works Cited

- <https://wonder.cdc.gov/controller/datarequest/D77>
- <https://www.arkmed.org/resources/prescription-monitoring/>
- <https://www.shouselaw.com/nevada/NV-good-samaritan-overdose.html>
- <https://nmhealth.org/news/information/2018/10/?view=715>
- [https://www.samhsa.gov/search\\_results?k=opioid](https://www.samhsa.gov/search_results?k=opioid)
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