

An Exploratory Data Analysis of the Increase in Opiate Deaths in the Early 2010's

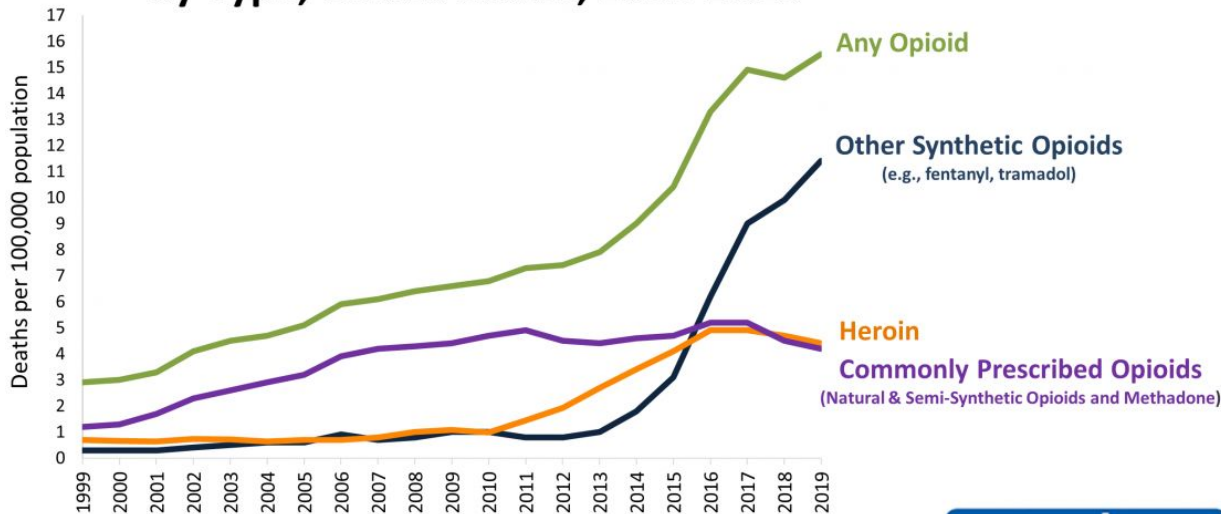
Jacob Bear, Stephen Cassata, Matthew Hrones, Richa Jain

Introduction

- The Opioid Epidemic has had a tremendous impact on the United States.
- Prescription Opioids have been widely over prescribed across the country for decades, causing millions of people to become dependent
- Following crackdowns on prescribing practices, opioid use patterns changed with increases in heroin and synthetic opioid use
- While opioid related deaths have been getting much worse over the past decades, there has been a sharp uptick since 2012-2014, associated with the rise in use of synthetic opioids
- **Our Hypothesis:** Fentanyl and other synthetic opioids are the main drivers of the increase in opioid related death rate, more so than region, age, gender, or race.
 - If this is the case, the large uptick in death rates should exist for all peoples across different types of demographic data.

The role of synthetic opioids

**Overdose Death Rates Involving Opioids,
by Type, United States, 1999-2019**

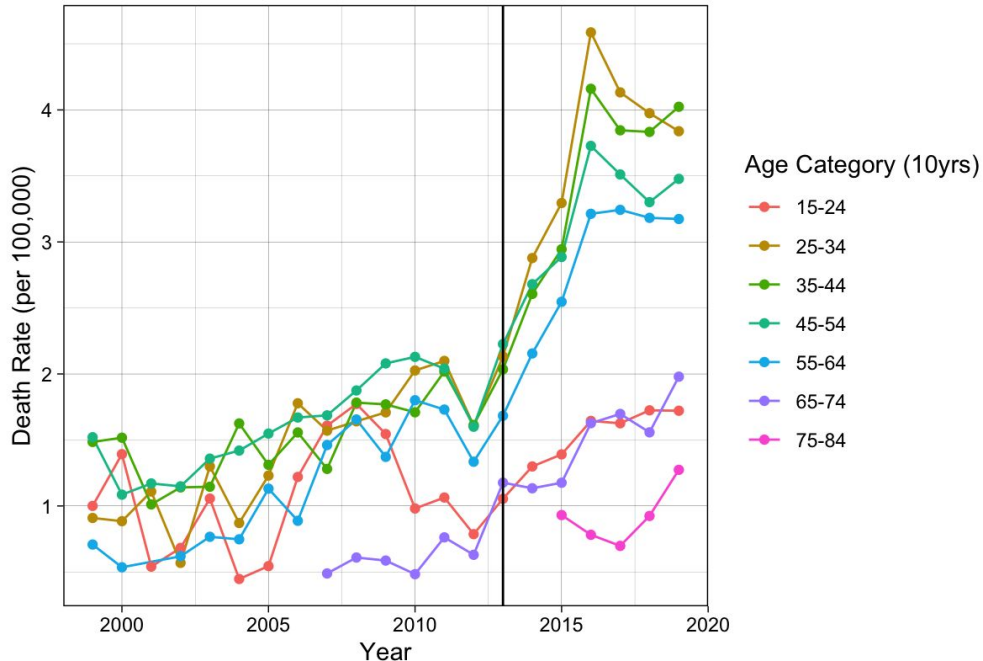


SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2020. <https://wonder.cdc.gov/>.

- Although Heroin and Commonly Prescribed Opioids make up a lower percentage of all opioid deaths, Synthetic Opioids have contributed to an increasing overall opioid death rate.

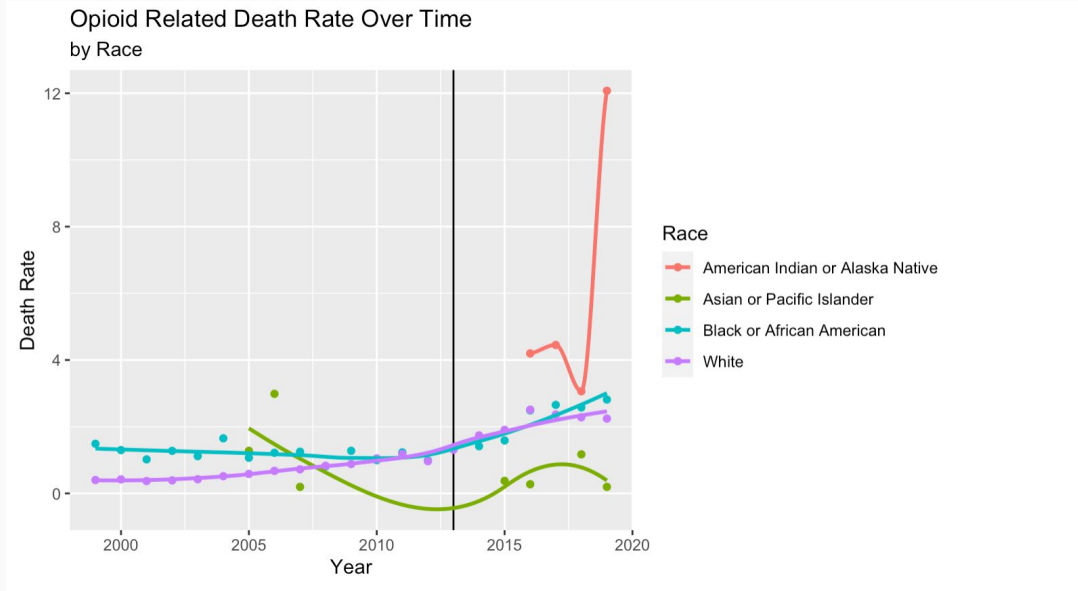
Demographic: Age

Opioid Related Death Rate Over Time by Age



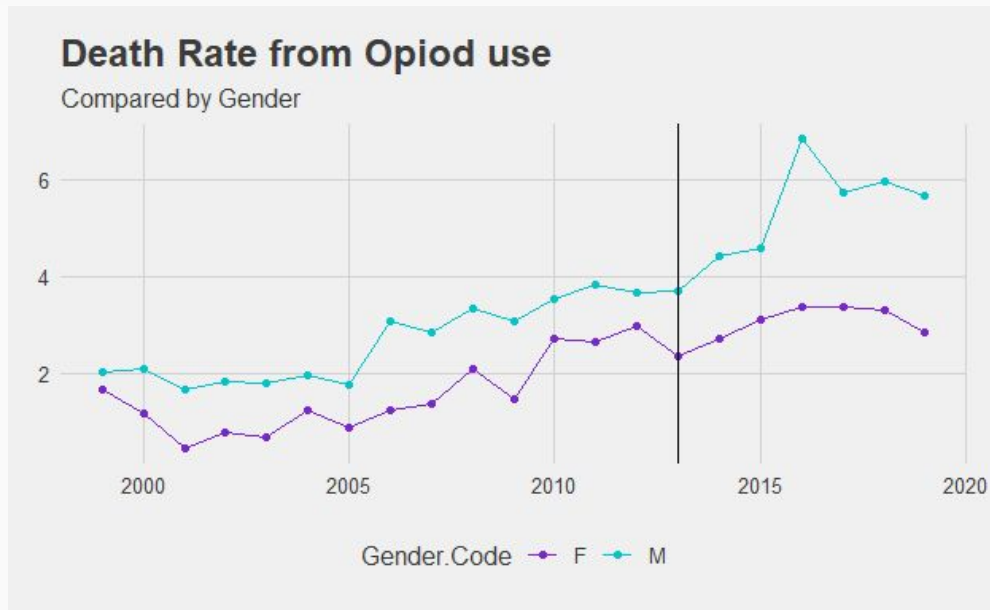
- We can see many age groups experienced a sharp increase in death rate beginning around 2012-2013.
- The 25-34 group passed the 45-54 group as the group with the highest opioid related death rate in 2013 and remained until 2018
- The youngest (15-24) and oldest (65-74, 75-84) groups all increased at some point after 2013 as well

Demographic: Race



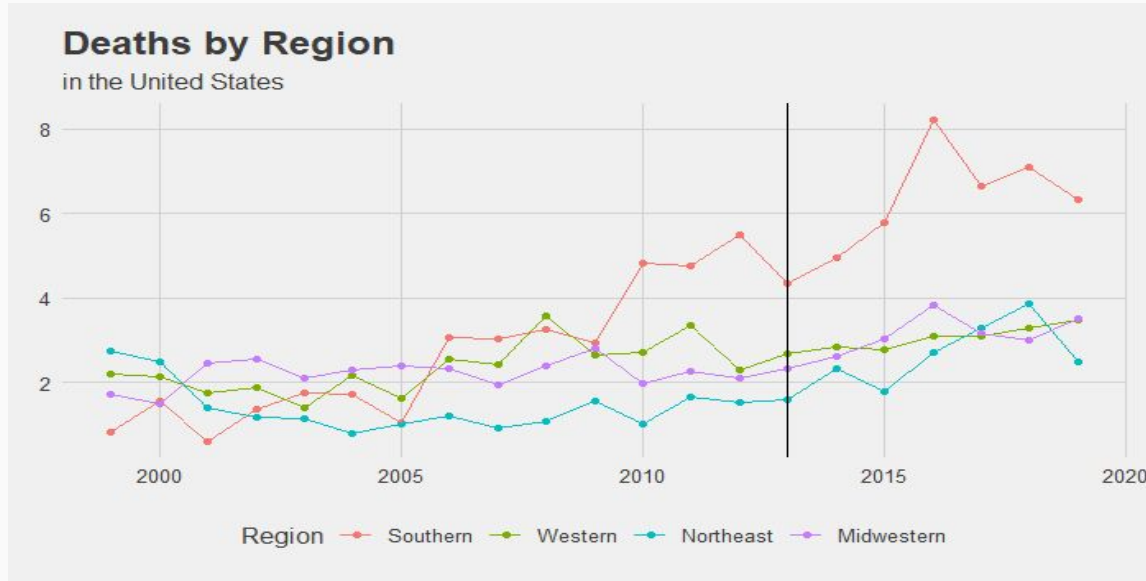
- The Black/African American race passed the White race for death rate and has had a higher death rate since.
- Asian/Pacific Islander death rate remained the same and has slightly decreased recently.
- American Indian/Alaska Native has had the highest death rate in recent years.

Demographic: Gender



- Broadly, males have a consistently higher death rate than women from opioid use
- Moreover, we can see in 2013-2015 a stark increase in the death rates
- Males have seen a stronger uptick in their death rate

Demographic: Regions



- We examined the death rates in different region, using US Census data to group the states
- Every region was found to have rising death rates around 2013-2014
- Southern states have a much higher proportional increase than other regions. Originally expected all to be similar, NE, MW slightly worse.
- Reasons for this could be criminalization of drugs in the south, lack of rural health care, and proximity to where many synthetic opioids are created.

Conclusion

- Younger people dying at higher rates than older populations
- Southern area experienced the largest spike in deaths
- Why did American Indian and Alaska natives see such a dramatic increase in deaths?
- Men have and continued to die from opioids at higher rates than women
 - Gender should be looked into further since men have always had a higher death rate
- It seems synthetic opioids may be driving the overall increase, but why are we seeing these trends in the demographics?
- Further research is warranted beyond the scope of this project

Recommendations

- A one size fits all approach may not be the most effective strategy to combat opioid deaths
- Each region, state, and county, may need to create tailored programs to the specific needs of their populations based on race, age, and gender
- Providing harm reduction and expanded access to medical care will be key
- Increasing availability of Narcan (opioid antagonist) may help prevent accidental deaths due to fentanyl and other synthetic opioids
- Ongoing surveillance will allow for the identification of new trends and swift action to address them

Recommendations

- Looking at race, the focus in the media has always seemed to be on White individuals; however, Black/African Americans and as of recent, American Indians/Alaska Natives have equal or higher death rates so we should be targeting improving opioid related death rates for these races as well.
- Referencing the gender data, there can be a stigma to seeking professional help for males, but these help sessions save lives and stop addiction, so they should be promoted more in the media.
- Based on our age data, specific programs aimed at addressing younger people may help reduce the rate at which new people start using opioids and middle aged people with a substance use disorder may need specialized care
- Based on our region data, see that the south is particularly hard hit. We recommend analyzing factors that are making other regions more successful during the crisis, and implement those policies.