Addressing the U.S. Opioid Epidemic with Visual Analytics

presented by
tri le

Why Opioids?

10.1 million
people misused prescription opioids in 2019[1]

1.6 million
people had an opioid use disorder in 2019[1]

70,630+
people died from drug overdose in 2019[2]

Sources:
1. 2019 National Survey on Drug Use and Health, 2020
2. National Center for Health Statistics, Data Brief No. 394, December 2020

Objective

Identify
which opioid contributes the most to overdose deaths

Determine
which U.S. states are affected most by the opioid epidemic

Explore
which age groups are more likely to overdose

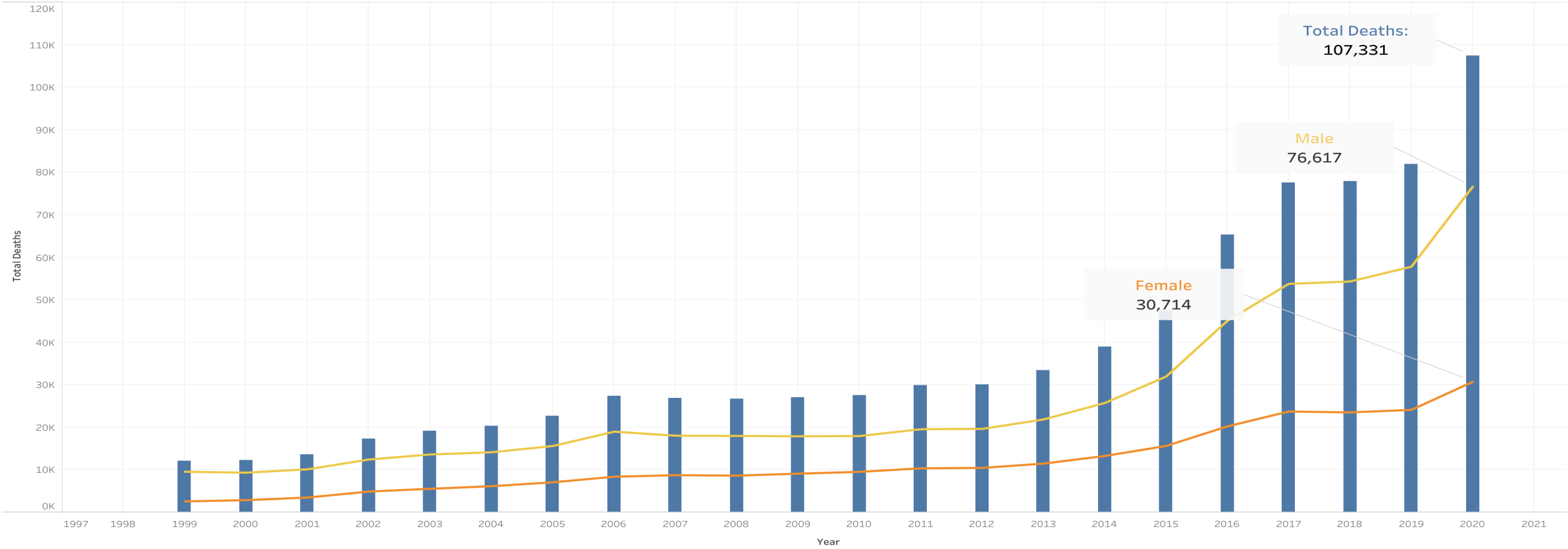
Provide
insight to U.S. policymakers and local government to help inform opioid abuse prevention and treatment needs

Methodology

- Dataset queried from CDC Wonder (online database of public health information)
- Initial EDA performed in Microsoft Excel and Python + Pandas
- Visualizations completed with Tableau Public
- 9807 unique data points
- Features include year, state, gender, age group, type of opioid, etc.

Findings and Results

U.S. Drug-Induced Overdose Deaths Involving Any Opioid, by Gender, 1999-2020



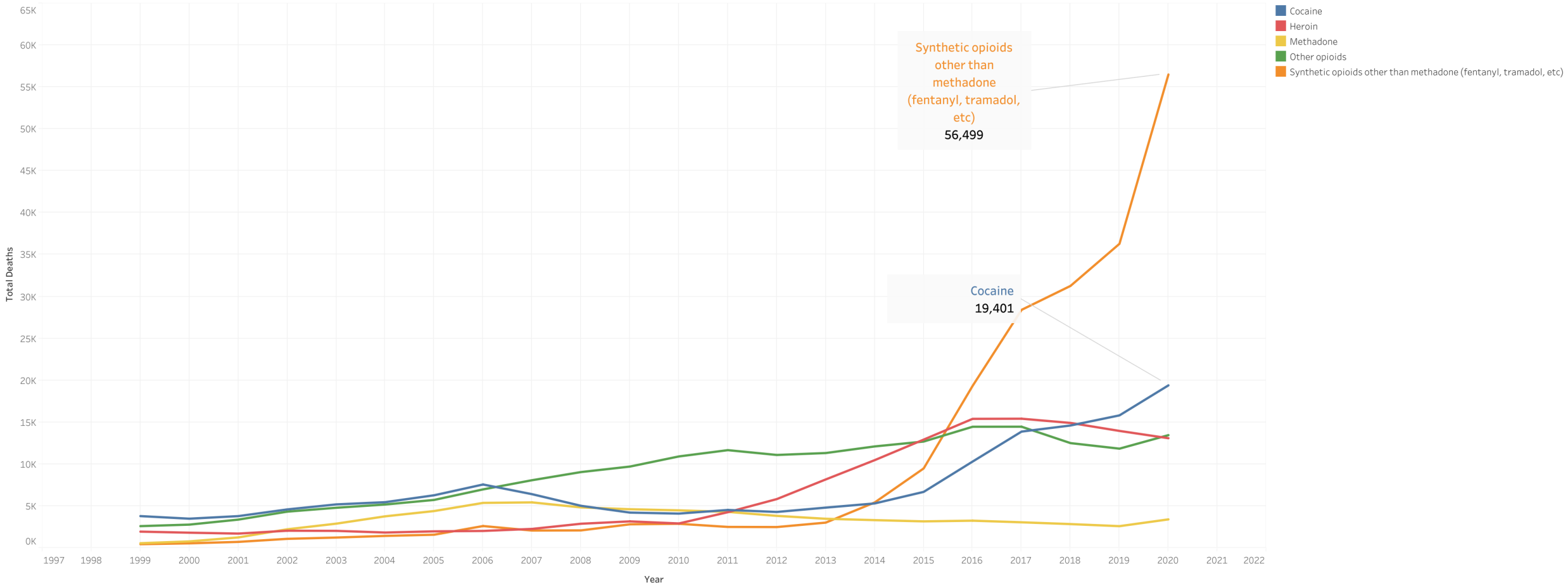
Includes opioid-related overdose deaths with underlying cause of *drug-induced causes (unintentional, suicide, homicide, undetermined, etc)* as categorized in the International Classification of Diseases (ICD-10).

Any opioid, as identified by the ICD-10 multiple cause of death includes the following: Heroin (T40.1), Other opioids (T40.2), Methadone (T40.3), Other synthetic opioids other than methadone (T40.4 - fentanyl, tramadol, etc), Cocaine (T40.5)

Source: https://wonder.cdc.gov/

Findings and Results

U.S. Drug-Induced Overdose Deaths by Opioid, 1999-2020



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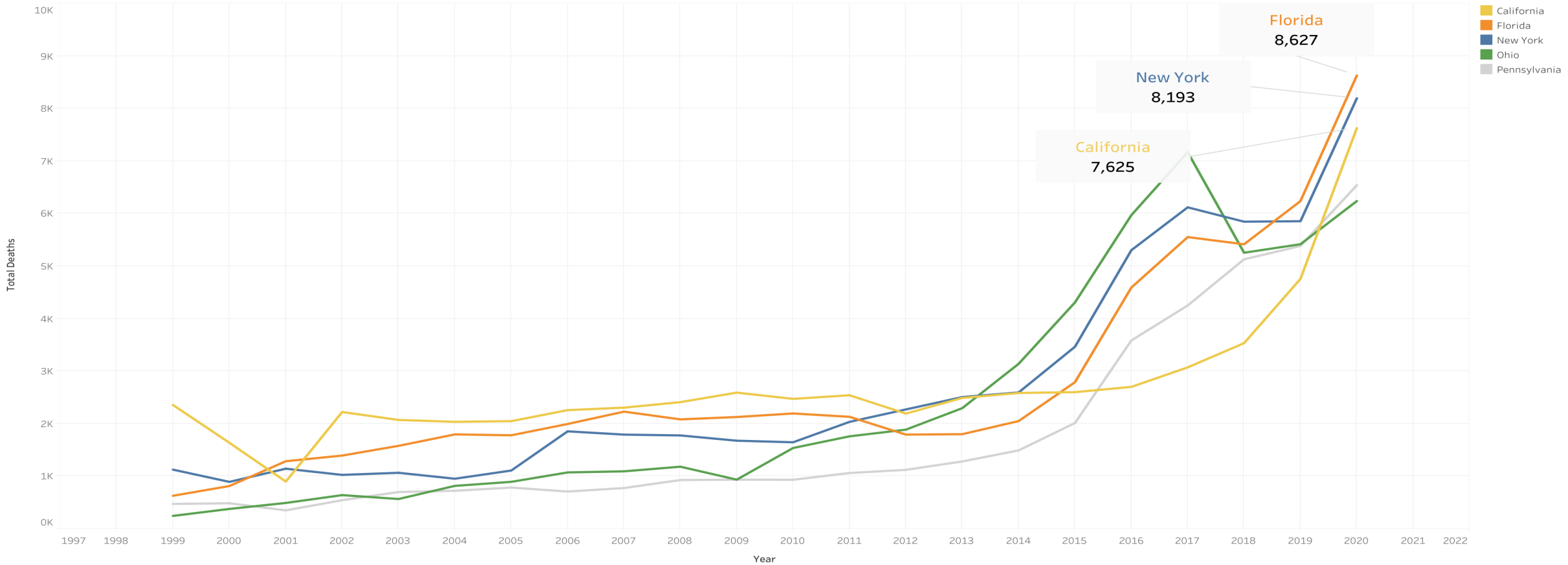
Findings and Results

Drug-Induced Overdose Deaths Involving Any Opioid, by State, 1999-2020



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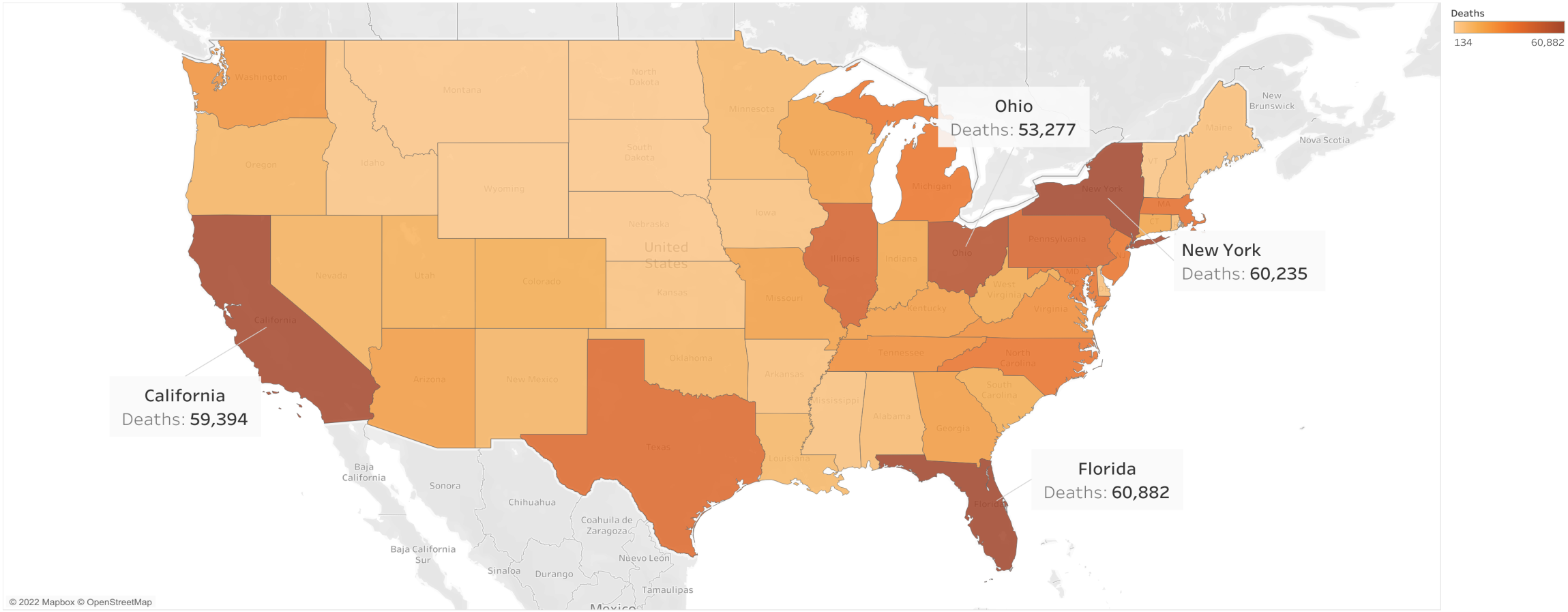
Findings and Results

Drug-Induced Overdose Deaths Involving Any Opioid, Cumulative by State, 1999-2020



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Findings and Results

U.S. Total Overdose Deaths Involving Synthetic Opioids Other than Methadone, by Age Group, 1999-2020

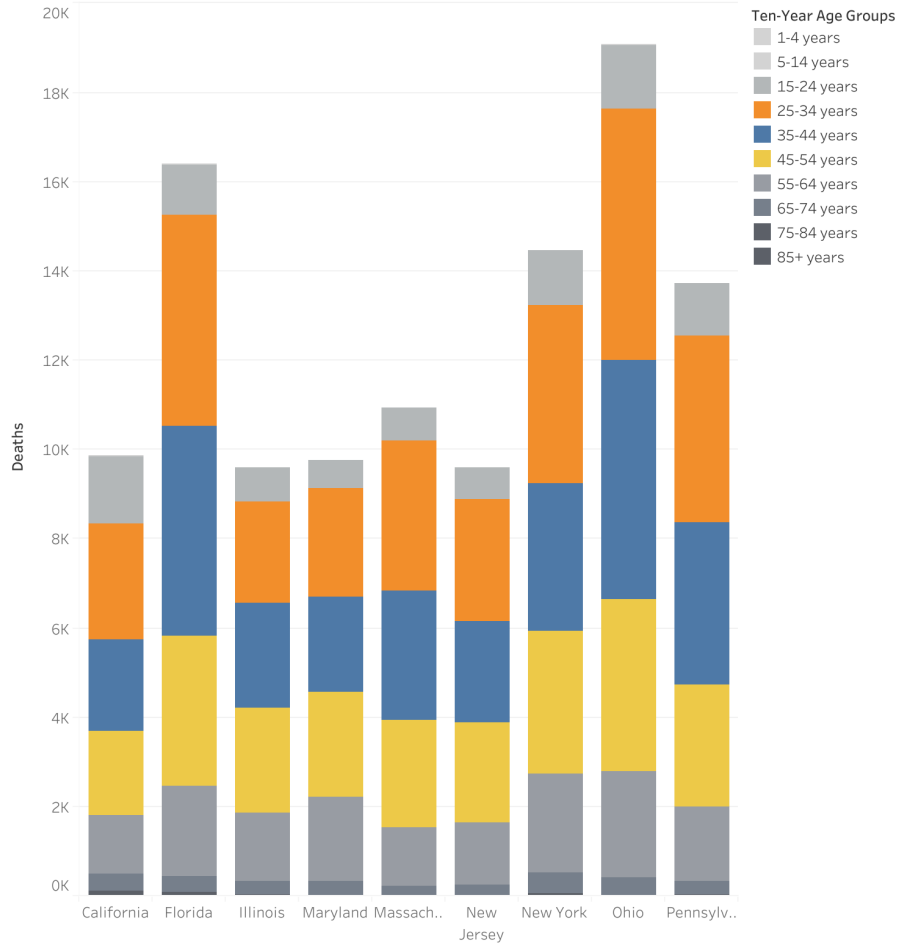
Total Deaths
216,506

Ten-Year Age Groups
- 1-4 years
- 5-14 years
- 15-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65-74 years
- 75-84 years
- 85+ years

Includes opioid-related overdose deaths with underlying cause of *drug-induced causes (unintentional, suicide, homicide, undetermined, etc)* as categorized by the International Classification of Diseases (ICD-10) involving synthetic opioids other than methadone (primarily fentanyl), 1999-2020.

States with Most Overdose Deaths Involving Synthetic Opioids Other than Methadone, 1999-2020

Most Overdose Deaths Involving Synthetic Opioids Other than Methadone, by Age Group, 1999-2020



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Conclusion

- Synthetic opioids (other than methadone) contribute to the most opioid overdose deaths in the U.S. and have increased over 1800% since 2013
- Florida, New York, California, and Ohio have surged ahead with opioid overdose deaths in the last 10 years
- Adults ages 25-54 make up more than 75% of all opioid-related deaths, while men are 2.5x more likely than women to overdose

Potential Future Work

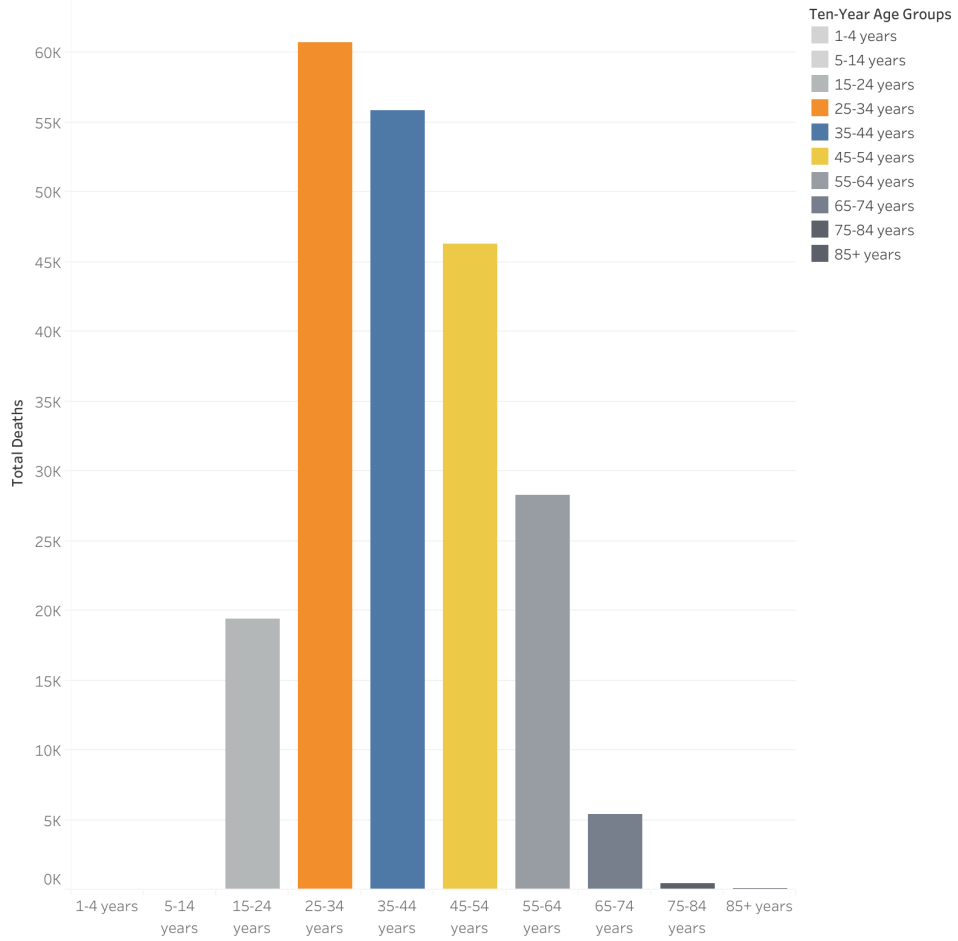
- Include population and demographic data from the U.S. Census for further potential analysis and insight
- Perform a more detailed geographic analysis of opioid-related deaths by county
- Construct an unsupervised learning model like clustering to identify which groups are more at risk of opioid overdose deaths

Questions?

metis business fundamentals
june 2022

Appendix

Distribution of U.S. Total Overdose Deaths Involving Synthetic Opioids Other than Methadone, by Age Group, 1999-2020



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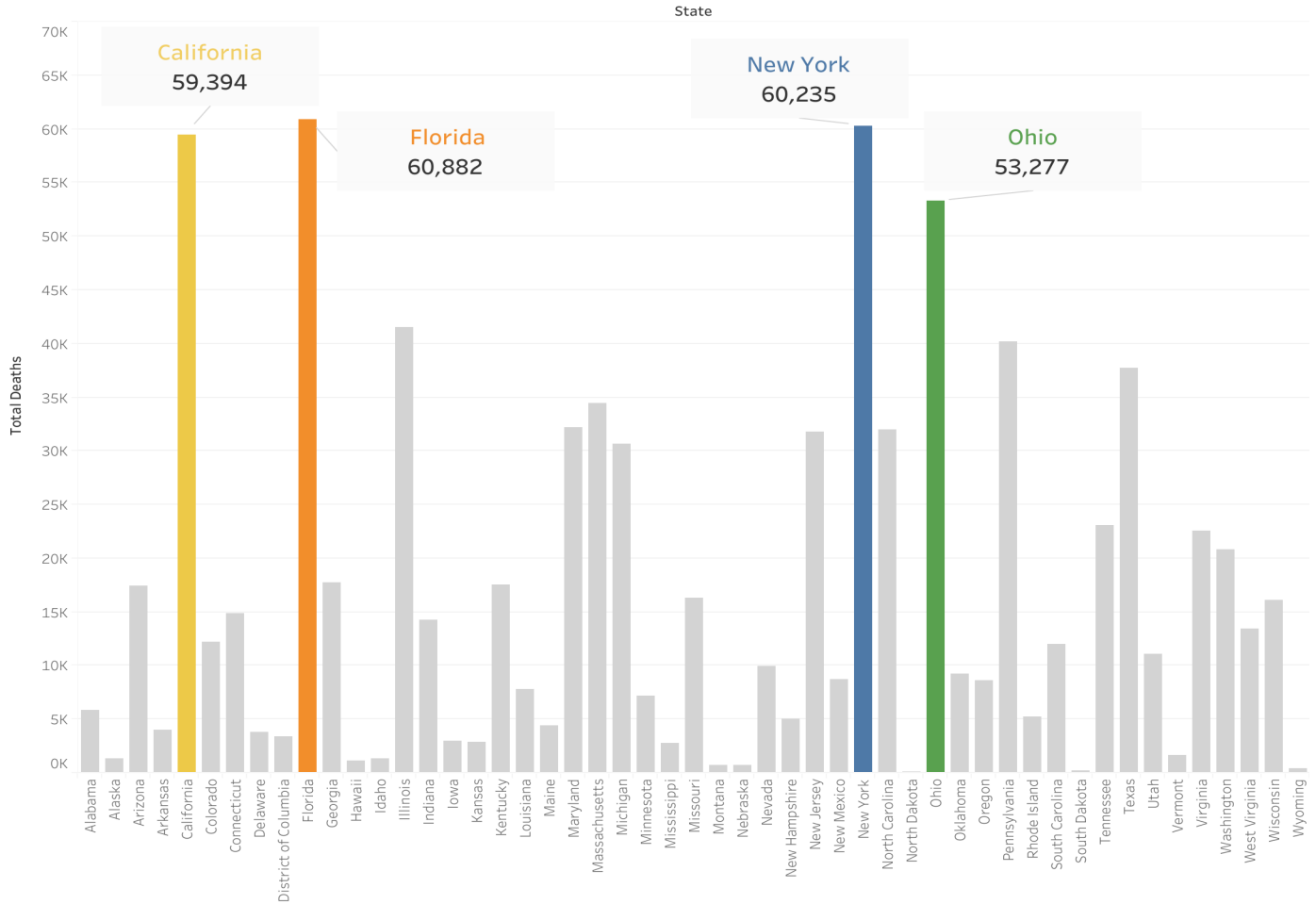
Appendix

Drug-Induced Overdose Deaths Involving Any Opioid, Cumulative by State, 1999-2020



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