

**SOCIAL DETERMINANTS OF HEALTH
AND DRUG OVERDOSE EVENTS IN
GREAT FALLS, MT (2019-2022)**

Katelyn Throckmorton
MPH Candidate & EMT-B



THE PROBLEM

- Drug overdose events are significantly increasing across the nation
- Opiate-related deaths have garnered national attention
- Narcan distribution is a reactive solution, rather than preventative



PURPOSE OF THIS RESEARCH

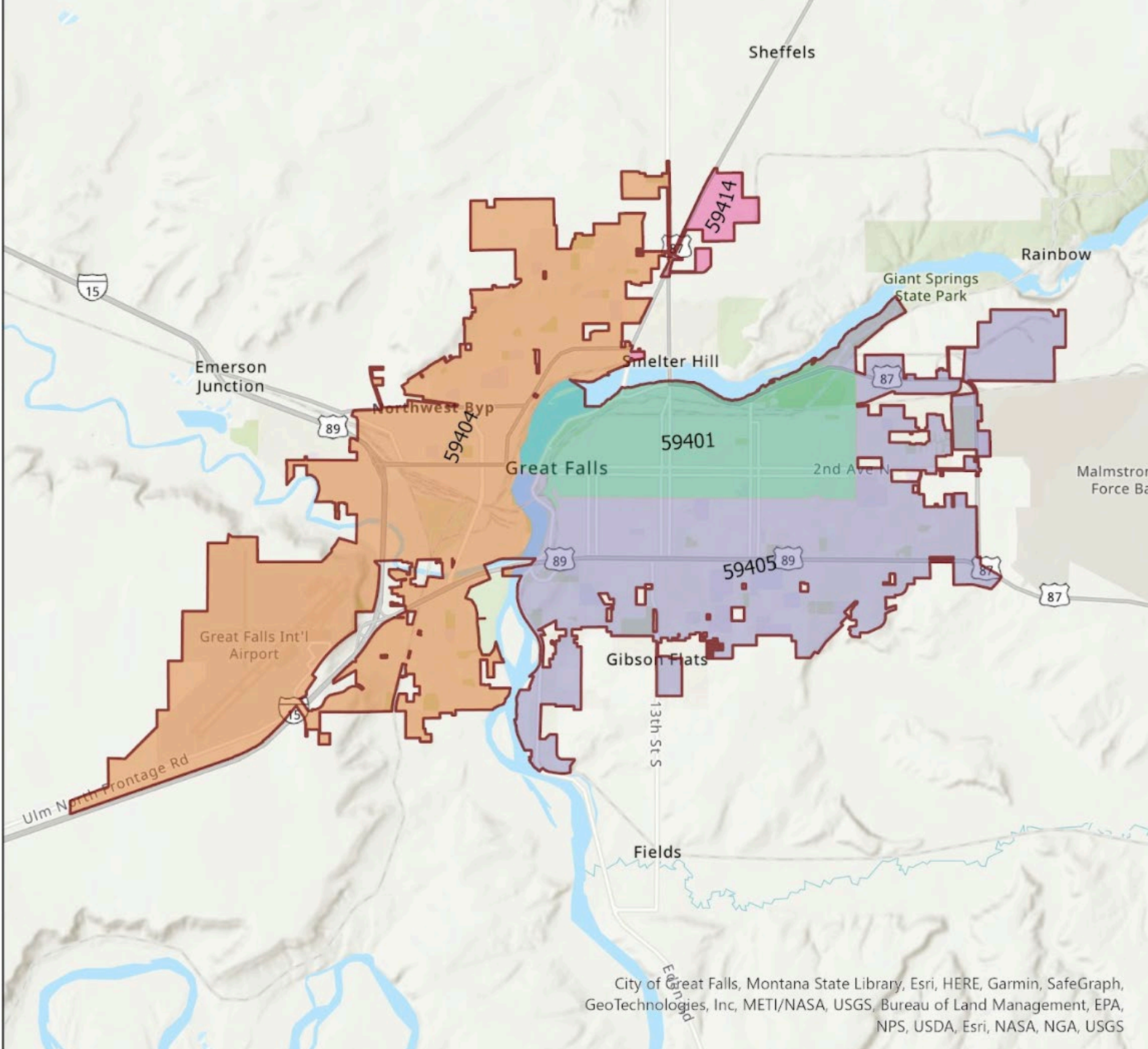
- Identify if correlations exist between certain SDoHs and overdose events in Great Falls, MT
- Provide data to guide future targeted interventions and research
- Encourage additional research across Montana communities to address the drug crisis
- Provide research on general drug overdose
 - Current work has strong focus on opiate related deaths and naloxone distribution



DATA AND LIMITATIONS

- Census Bureau data from 2020 census to provide background of population
- EMS data from NEMESIS for overdose suspected calls and total 911 calls
- Provider's Primary Impression drove overdose diagnosis
- Provider's Secondary Impression drove self-harm determination
- Limited by overdoses called into 911 and investigation of EMS personnel
 - Recent studies support EMS data as accurate, despite potential room for error

CITY OF GREAT FALLS



City of Great Falls, Montana State Library, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, Esri, NASA, NGA, USGS

MAKEUP OF GREAT FALLS

GREAT FALLS, MT¹

- Median Household Income – \$55,521
- Homeowning Population – 65.2%
- Poverty Rate – 14.5%
- Bachelor's or Above – 28.2%
- Aged 65+ - 18.1%
- 59401 Median Home Price – \$285,000
- 59404 Median Home Price – \$429,900
- 59405 Median Home Price – \$325,000

NATIONAL²

- \$74,755
- 39.9%
- 11.9%
- 35.7%
- Estimate – 17.3%
- Median Home Price – \$416,100

WHAT DOES THIS TELL US?



Population density of
2,627.5¹

3rd Largest City in State

Representative of other mid-size cities in
MT



Blue-collar, working-class
community

Representative of other working-class
communities in the United States



Affluency concentrated in 59404

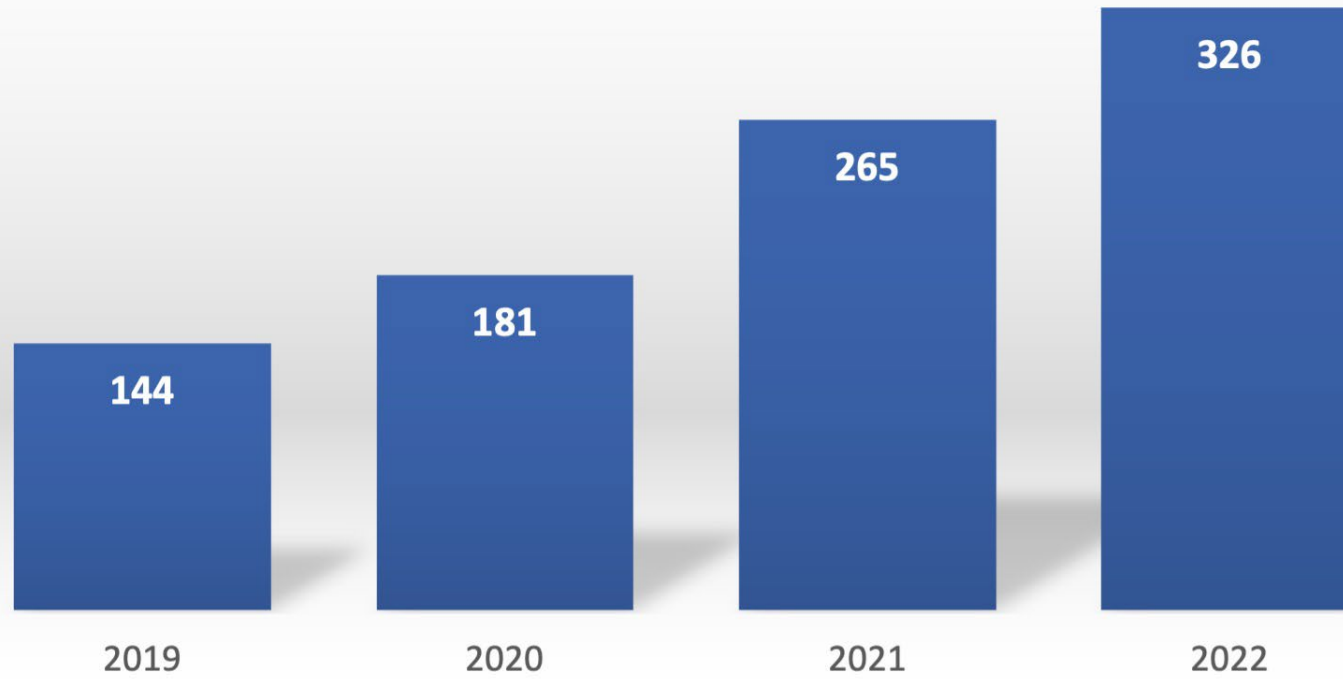


EXPECTED FINDINGS

- Disparities will exist across racial groups, including in risk of self-harm³
- Overdose events occur more frequently in zip codes with lower income indicators
 - Participation in negative health behaviors show a gradient that tracks with SES⁴

OVERDOSES
2019-2022

Overdose by Year





SIGNIFICANT FINDINGS

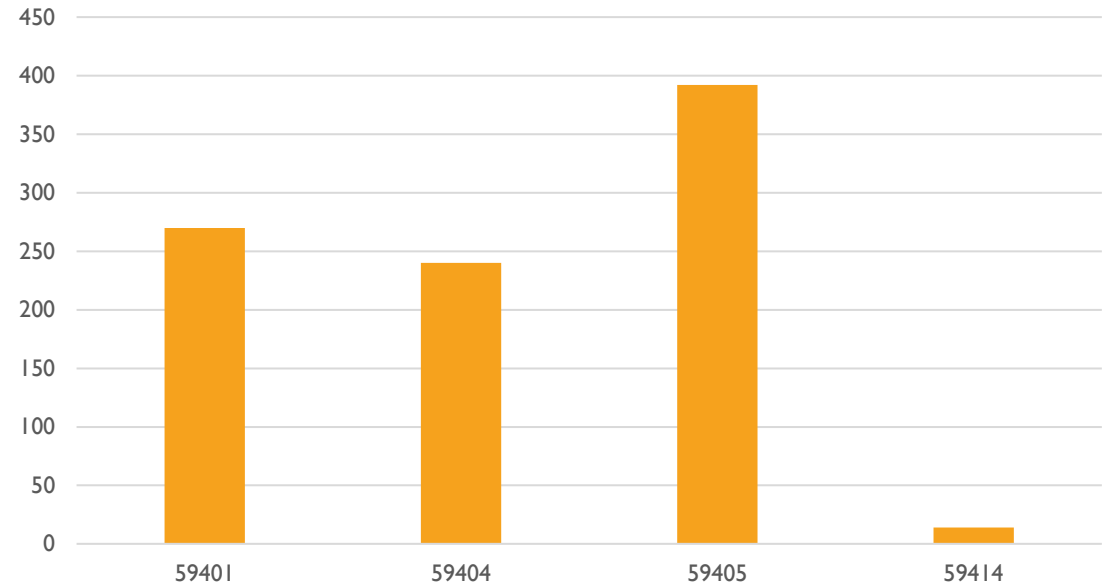
- **No** significant difference in overdose events by zip code
- **No** significant difference in overdose events by race
- Significant findings for self-harm overdose events by age

OVERDOSE BY ZIP CODE

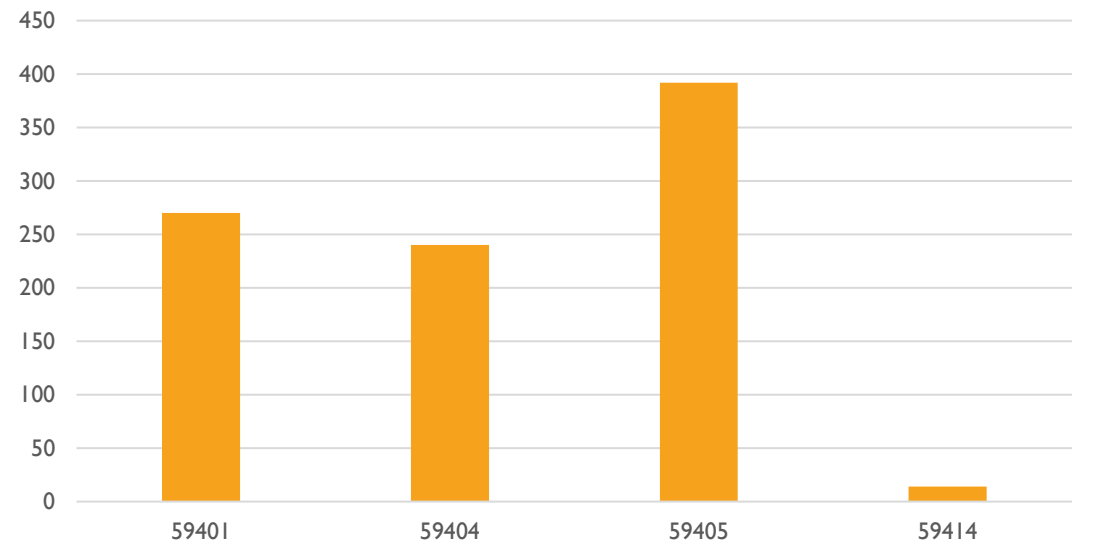
- Risk ratio of overdosing in all zip codes was ~1.00
 - 59401: 1.00
 - 59404: 1.00
 - 59405: 0.997
 - 59414: 1.02
- Chi-Square Test for Homogeneity
- Compared 59405 and 59404
 - 59405 represents mid-level SES
 - 59404 represents highest level SES
- Chi-Square p-value = 0.305

OVERDOSE BY ZIP CODE

Total 911 Calls by Zip Code



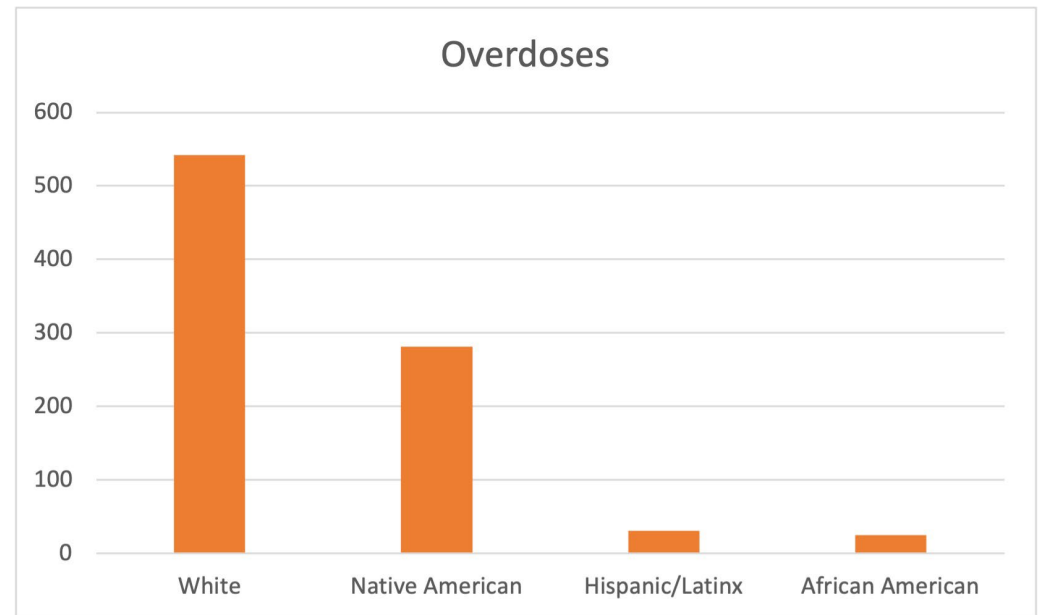
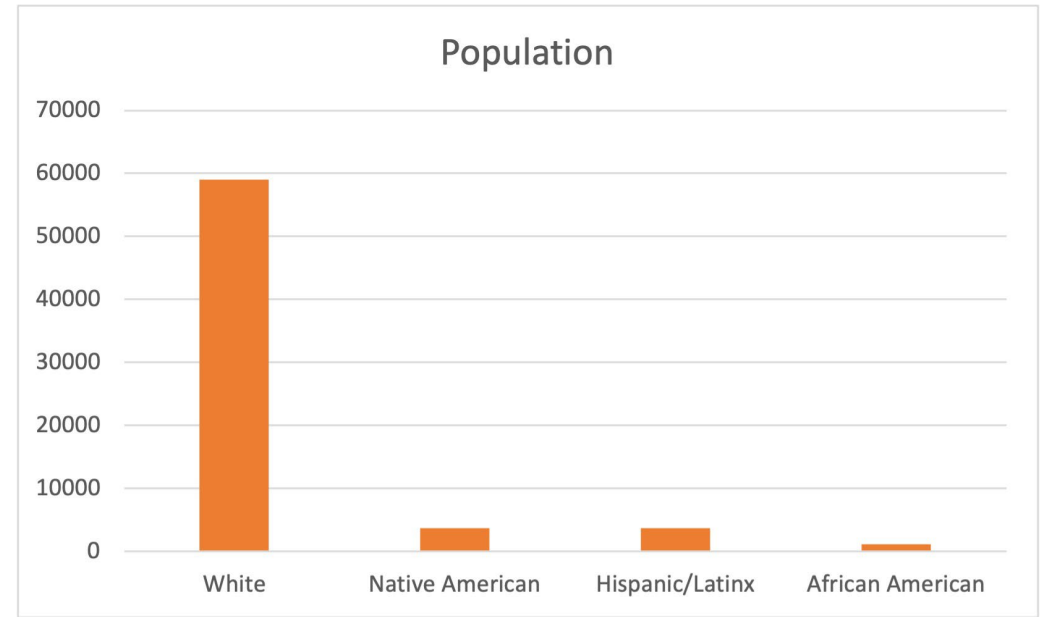
Overdoses by Zip Code



OVERDOSE BY RACE

- 4 key groups determined by population size
 - White – 59,002
 - Native American – 3,677
 - Hispanic/Latinx – 3,368
 - African American – 1,156
- Risk ratio showed all groups to have similar risk of overdosing
 - White – 0.971
 - Native American – 1.07
 - Hispanic/Latinx – 0.995
 - African American – 1.01

OVERDOSE BY RACE

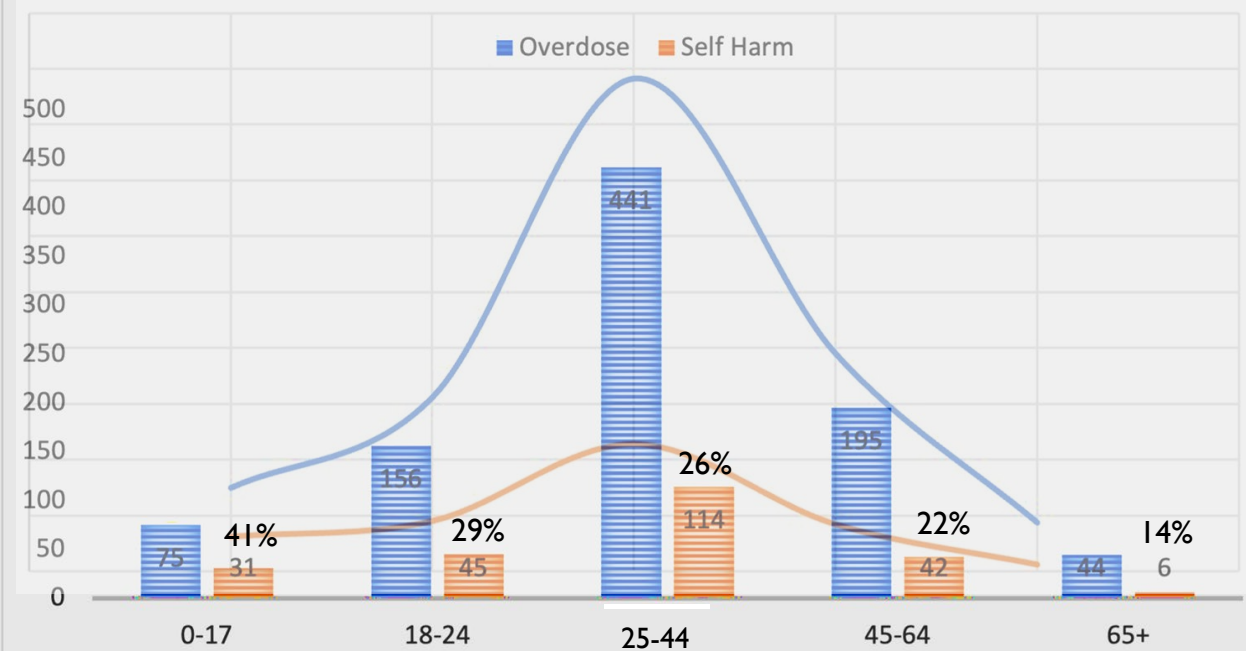


SELF HARM & OVERDOSE

- Chi-Square Test found a significant association between age group and self-harm overdoses
 - $p = 0.00943$
- Risk Ratio found significance in self-harm overdoses by age group
 - 0-17 intentionally ODing – **1.27**
 - 18-24 intentionally ODing – 1.04
 - 25-44 intentionally ODing – 1.10
 - 45-64 intentionally ODing – 0.919
 - 65+ intentionally ODing – 0.843

SELF HARM AND OVERDOSE

SELF HARM OVERDOSES BY AGE GROUP





SELF HARM AND OVERDOSE

- Mental health history may be a good indicator of future self harm
 - Those with mental health history are 2.35x more likely to have a self harm related OD
 - Self harm related ODs have increased risk of fatal outcomes (RR = 1.09)



OVERDOSE INTERVENTIONS

- Naloxone administration reduced risk of fatality only slightly
 - RR of fatal outcome with naloxone administration = 0.922
- Interventions for mental health may prove more beneficial
 - 0–17-year-olds spend significant amounts of time in school
 - Implementing mental health in schools may be a successful, preventative intervention
 - Addressing mental health from beginning ages may also reduce use in later ages, regardless of self harm intentions
 - **Addiction is a mental health issue**

QUESTIONS?

REFERENCES

1. *Explore Census Data*. (n.d.).
https://data.census.gov/profile/Great_Falls_CCD,_Cascade_County,_Montana?g=060XX00US3001391533
2. *Explore Census Data*. (n.d.). <https://data.census.gov/profile?g=010XX00US>
3. Eylem, Z., De Wit, L., Van Straten, A., Steubl, L., Melissourgaki, Z., Danişman, G. T., De Vries, R., Kerkhof, A., Bhui, K., & Cuijpers, P. (2020, June 8). *Stigma for common mental disorders in racial minorities and majorities a systematic review and meta-analysis*. BMC Public Health; BioMed Central. <https://doi.org/10.1186/s12889-020-08964-3>
4. Dunn, J. R. (2010, March 24). Health Behavior vs the Stress of Low Socioeconomic Status and Health Outcomes. *JAMA*, 303(12), 1199.
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