



# Washington State Opioid Overdose Vulnerability Assessment

## Background

Opioid use and overdoses are increasing in the United States and in Washington State.<sup>1,2</sup> People who inject drugs (PWID) are at higher risk of overdose than individuals who use drugs via other routes of administration (e.g., snorting, smoking).<sup>3</sup> Following an HIV outbreak among PWID in Scott County, Indiana in 2015,<sup>4</sup> the US Centers for Disease Control and Prevention (CDC) conducted a study to identify indicator variables associated with injection drug use in order to determine which US counties may be vulnerable to new or increasing rates of HIV or HCV among PWID.<sup>5</sup> In 2019, Washington State performed a similar analyses and included opioid overdose as a third outcome. This summary reports findings of the Washington State opioid overdose county-level vulnerability assessment.

## Methods

We collected county-level data for 57 indicators from 2015 and 2016 that were identified in the CDC analysis,<sup>4</sup> in a subsequent vulnerability assessment Tennessee conducted,<sup>5</sup> or because of the Washington context. Asotin, Columbia, and Garfield were combined due to small numbers and data availability. We used 2015 data to fit and 2016 data to test our model. We summed hospitalizations and deaths related to opioid use and then created a binary variable of cases that were lower than the median ( $\leq 21$  cases) or higher ( $> 21$  cases). We used lasso regression to identify predictors of the outcome. Any predictor that was in 100% of the 100 lasso regression runs was included in adjusted logistic regression models and evaluated. We performed logistic regression with the identified predictors for the 2015 data. We used the resulting coefficients to predict 2016 outcomes, compare them to actual counts, and rank counties.

## References

1. Centers for Disease Control and Prevention Opioid Overdose: Understanding the Epidemic. <https://www.cdc.gov/drugoverdose/epidemic/index.html>.
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3. Mathers BM, Degenhardt L, Bucello C, Lemon J, Wiessing L, Hickman M. Mortality among people who inject drugs: a systematic review and meta-analysis. *Bulletin of the World Health Organization*. 2013;91(2):102-123.
4. Peters PJ, Pontones P, Hoover KW, et al. HIV Infection Linked to Injection Use of Oxycodone in Indiana, 2014-2015. *The New England journal of medicine*. 2016;375(3):229-239.
5. Van Handel MM, Rose CE, Hallisey EJ, et al. County-Level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *J Acquir Immune Defic Syndr*. 2016;73(3):323-331.
6. Rickles M, Rebeiro PF, Sizemore L, et al. Tennessee's In-state Vulnerability Assessment for a "Rapid Dissemination of Human Immunodeficiency Virus or Hepatitis C Virus Infection" Event Utilizing Data About the Opioid Epidemic. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America*. 2018;66(11):1722-1732.

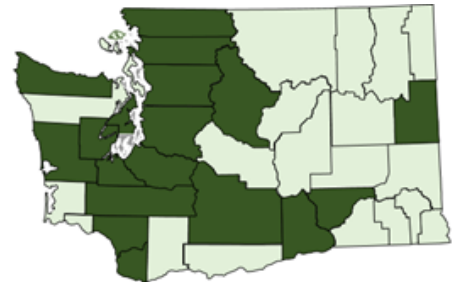
## Results

There were four variables that appeared in the lasso regression 100% of the runs and converged well in the regression model: the percent with vehicle access; rate of specialists in infectious disease, gastroenterology, hepatology, and addiction medicine; drug trafficking hot zone (yes/no); and the rate of patients with 5+ prescribers and 5+ opioid dispensers. The model predicted counties that were above or below the median count of opioid overdoses 92% accurately for 2015 and 95% accurately for 2016. County-level results are shown below.

### 2015 Results



### 2016 Results



□ opioid overdose ≤ median  
■ opioid overdoses > median

*The model made 2 inaccurate predictions in 2016: Grant was predicted to have less than an average number of opioid overdoses and Franklin was predicted to have a higher than average number of overdoses.*

## Next Steps

We identified predictors of having higher than average opioid overdoses in Washington State counties. These indicators can be tracked on the county level to inform overdose prevention efforts. Strategic interventions should be identified for counties with predicted higher overdoses. Our models have limitations, including limited years of data and not including overdoses that were reversed. Future work will assess performance on 2017 and 2018 data and include data regarding overdose reversals.

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