Social Vulnerability

Social vulnerability refers to demographic and socioeconomic factors that adversely impact communities that encounter health risks, or community stressors.[1]

A Social Vulnerability Index (SVI) refers to a data informed tool to identify communities vulnerable to health risks such as disease outbreaks and/or fatalities.

Why Identify At-Risk Counties?

In the US, Hepatitis C Virus (HCV) infections related to injection drug use has doubled since 2015. Fatal overdoses increased by 500% between 1999-2022, and in 2015, an HIV outbreak was observed among persons who inject drugs in Indiana who were also largely socially vulnerable. As a result of disparities surrounding substance use, such as the outbreak in Indiana, several states began to analyze factors contributing to county-level health risk.

In North Dakota, the link between substance use and infectious diseases remains a public health concern. North Dakota Health and Human Services developed a vulnerability index in 2017 to identify counties most susceptible to HCV outbreaks among individuals who inject drugs. Since then, harm reduction efforts such as syringe service programs have been legalized in communities at risk for HIV and hepatitis C.

Aims & Risks Evaluated

Three models were utilized for the SVI to determine which North Dakota county is most vulnerable to hepatitis C and overdoses. The SVI models were used to:

- Identify the counties' most at-risk for:
  - Injection drug use-related Hepatitis C outbreak (Model 1)
  - All drug-related fatal overdoses (Model 2)
  - Opioid-related fatal overdose (Model 3)
- Determine the modifiable factors that can reduce risk.

Several county level factors were considered as part of determining vulnerability, including socioeconomic conditions, drug use behavior, and healthcare access.

Factors with strongest association to each risk (HCV and fatal overdoses) were used to determine vulnerability score. Higher vulnerability scores indicated that a county has increased chances of encountering the risk, but it does not guarantee that the risk will occur. Based on the score, counties were ranked and organized into 4 groups based on risk level. Refer to Figures A-C and Table 1-3 below that illustrate the county risk from the three SVI models.

Takeaways

Rural counties were consistently identified as areas with elevated vulnerability across all models. The factors that were major drivers of vulnerability included limited vehicle access and residing in a mobile home. The risk of fatal overdose was reduced when individuals were engaged in SSP service as well as hospital and mental health providers being present in the county. This is likely because of naloxone distribution (a common service provided by SSPs and hospitals).

Just as with vulnerability assessments analyzed in other states, these findings reveal that rural, historically underserved counties often have increased factors driving risk of adverse health outcomes and were identified to be the most vulnerable to hepatitis C outbreaks and fatal overdoses.

Action Opportunities

Broadening harm reduction initiatives, such as syringe services, access to healthcare facilities and mental health resources, can effectively reduce overdose deaths and Hepatitis C outbreak/transmission risk, while also improving overall community health outcomes.

Sources

[1]Social Vulnerability Index | Place and Health - Geospatial Research, Analysis, and Services Program (GRASP) | ATSDR

Model Result

## Model 1: Injection Drug Use Related-HCV Outbreak
Figure A

Model 1 determined that the top 10 counties with the most increased risk for IDU-related Hepatitis C outbreak were: Sioux, Benson, Mountrail, Rolette, Ramsey, Towner, Dunn, McKenzie, Grant and Morton.
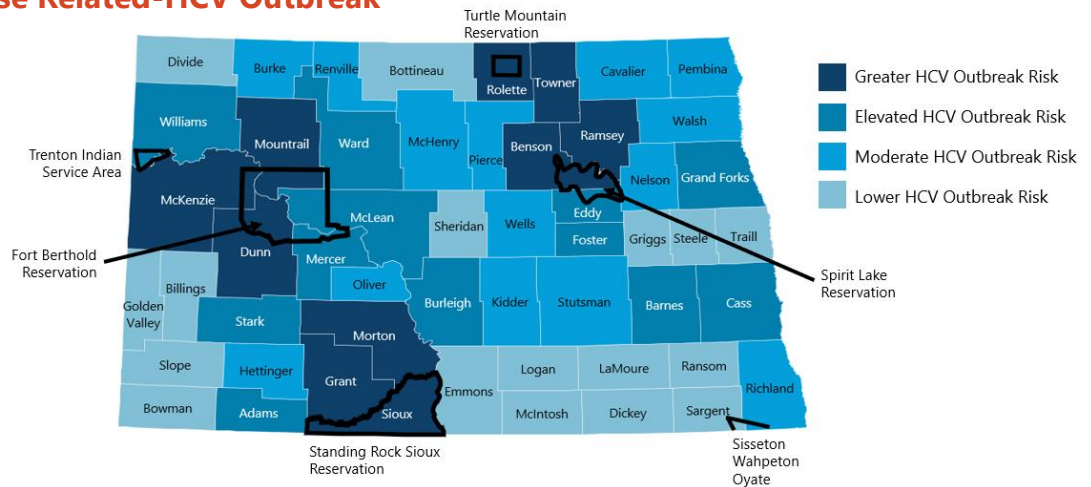
Model 2: All Drug Overdose
Figure B

Model 2 determined that the top 10 counties with the most increased risk fatal all drug overdose were: Sioux, Mountrail, McKenzie, Rolette, Burleigh, Benson, Ward, Stark, Cass and Williams.
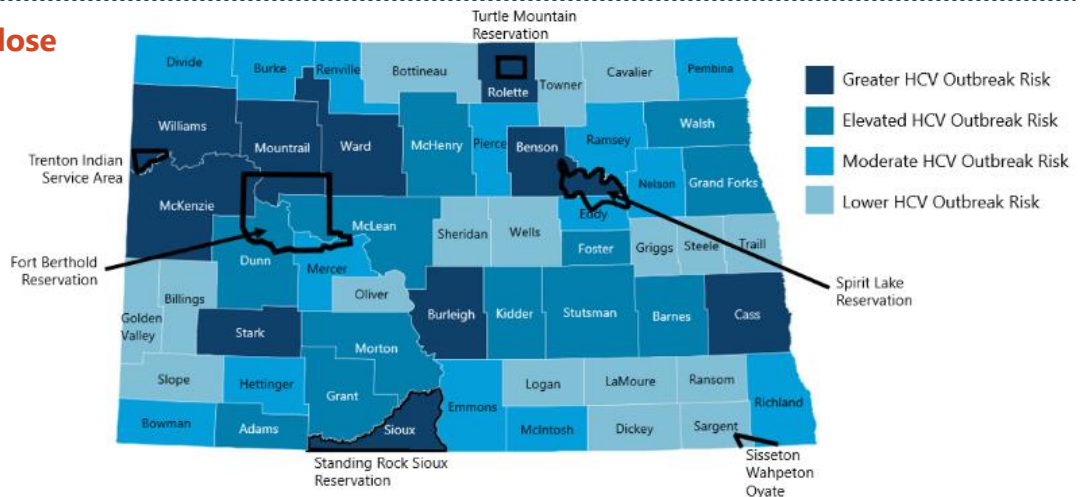
Model 3: Opioid Overdose
Figure C

Model 3 determined that the top 10 counties with the most increased risk fatal opioid overdose were: Sioux, Mountrail, McKenzie, Rolette, Ward, Renville, Dunn, Bottineau Burleigh and Adams.