Nevada Vulnerability Assessment

Risk of Opioid Overdose and HIV

Executive Summary

Over the past ten years, the United States opioid epidemic has drastically increased opioid overdose-related hospitalizations and deaths.[1] The opioid epidemic has also resulted in increased injection drug use (IDU), which is a key risk factor for acquiring human immunodeficiency virus (HIV) and viral hepatitis.[2,3,4] HIV testing, linkage to care, and retention in care are significant economic and epidemiological burdens throughout the United States.[5] An example of rapid HIV transmission secondary to IDU occurred in 2014-2015 in Scott County, Indiana.[6,7] This outbreak resulted in a declaration of public health emergency and sparked nationwide interest in the prevention of IDU-related HIV.[7]

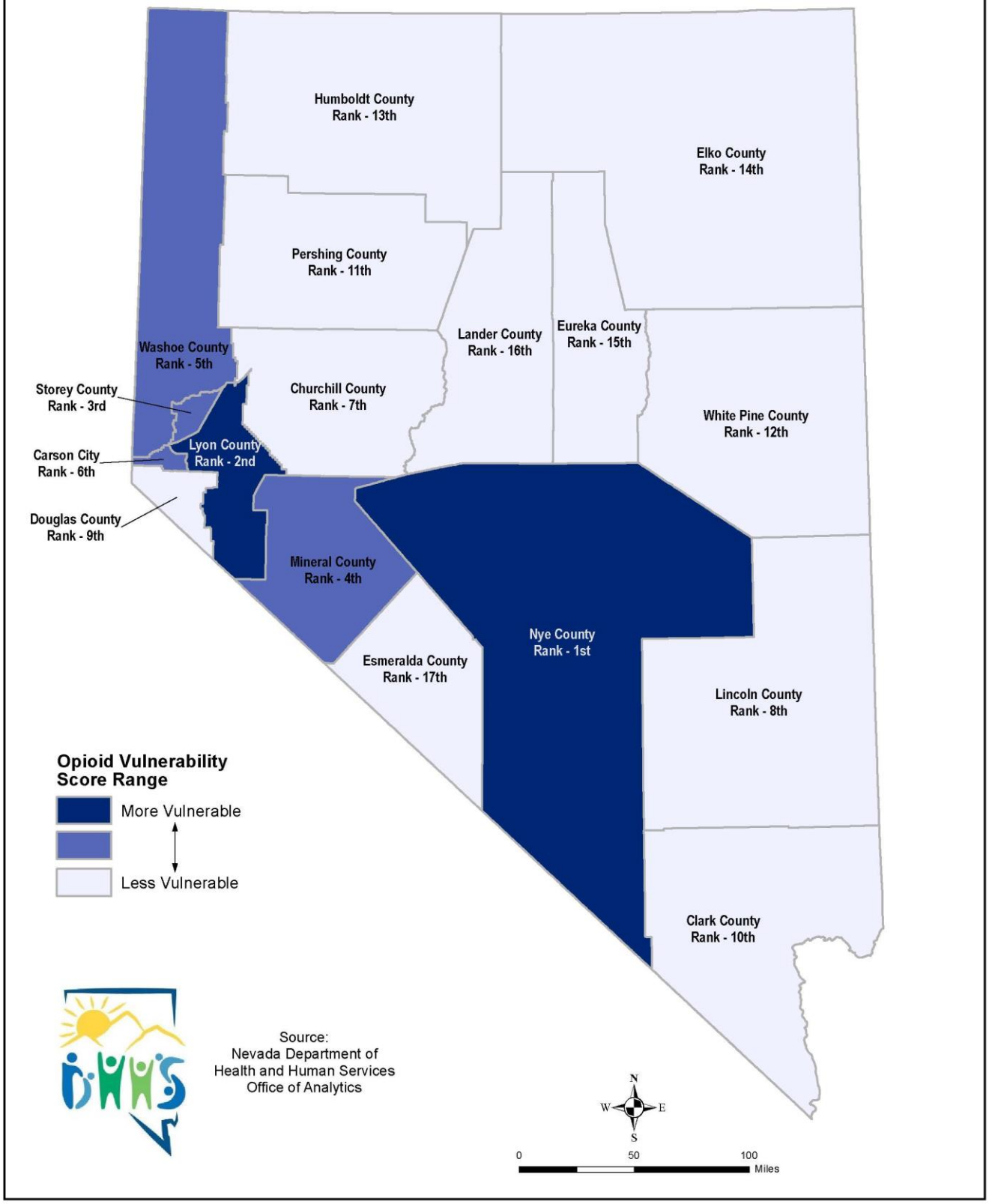
Opioid-related mortality and morbidity are public health concerns in Nevada. In 2018, Nevada experienced 12.2 opioid-involved deaths per 100,000.[8] Additionally, in 2018, there were 24.2 opioid overdose-related emergency department (ED) visits per 100,000 and 16.0 opioid overdose-related hospitalizations per 100,000.[8] Furthermore, much of Nevada is defined as rural and frontier and IDU and injection-related HIV are increasing public health concerns in nonurban areas.[9] Nonurban areas also present unique challenges for prevention and care.[3,9]

The purpose of this county-level vulnerability assessment and subsequent report were to detect and categorize Nevada counties that may experience a higher risk for opioid overdose and incidence of injection-related HIV. The results and significant findings can be used by community partners and stakeholders to further future harm reduction interventions and prevention strategy planning. Findings from this report can help to mitigate the negative public health effects of the opioid epidemic in Nevada.

Elevated Risk Counties

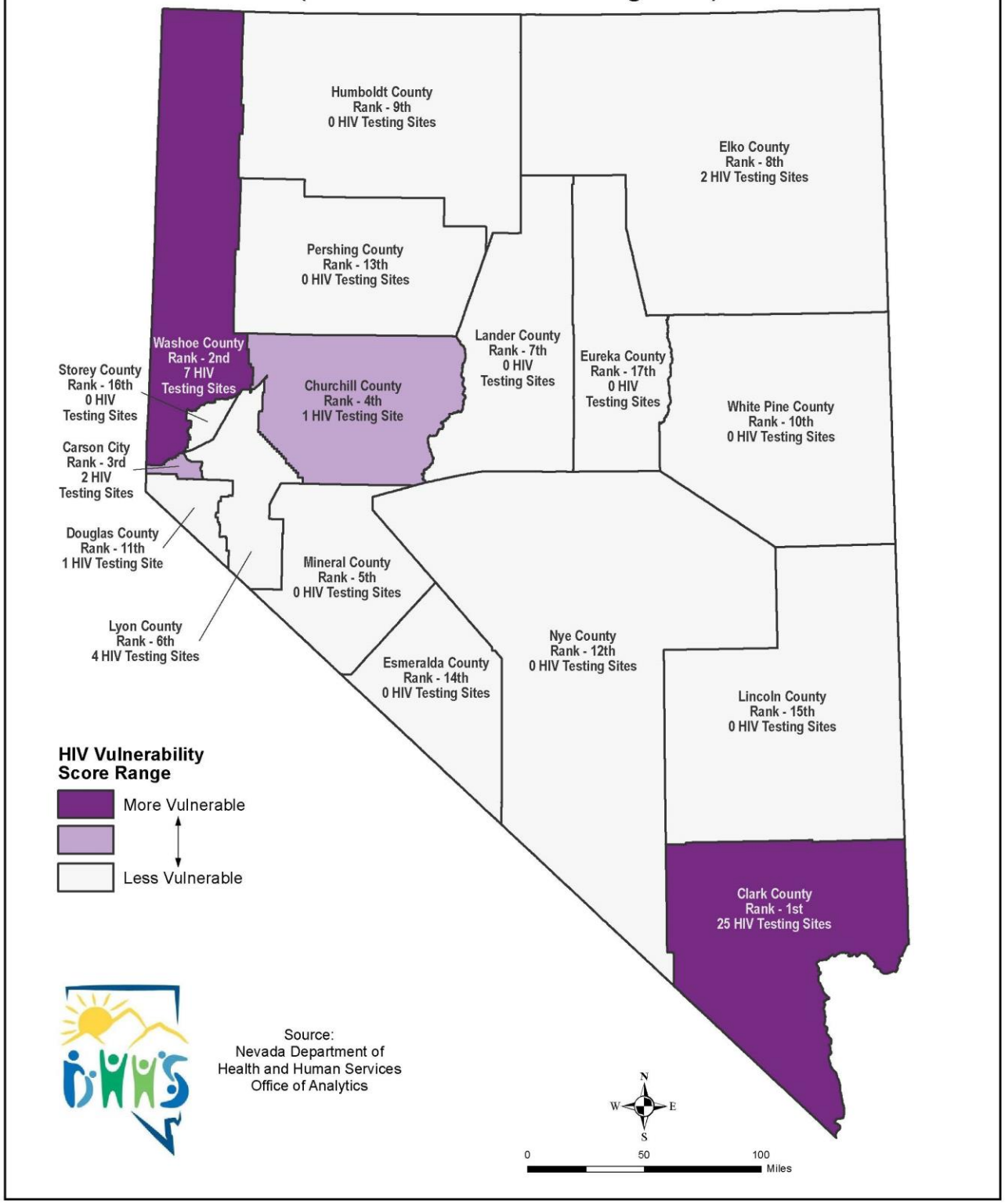
Opioid Vulnerability by County	HIV Vulnerability by County
1. Nye	1. Clark
2. Lyon	2. Washoe
3. Storey	3. Carson City
4. Mineral	4. Churchill
5. Washoe	5. Mineral
6. Carson City	6. Lyon
7. Churchill	7. Lander
8. Lincoln	8. Elko
9. Douglas	9. Humboldt
10. Clark	10. White Pine
11. Pershing	11. Douglas
12. White Pine	12. Nye
13. Humboldt	13. Pershing
14. Elko	14. Esmeralda
15. Eureka	15. Lincoln
16. Lander	16. Storey
17. Esmeralda	17. Eureka

Opioid Vulnerability by County Ranked More to Less Vulnerable



HIV Vulnerability by County Ranked More to Less Vulnerable

(with Number of HIV Testing Sites)



Assessment Indicators

All assessment indicators were established through 2015-2017 aggregate data. All rates are calculated per 100,000 population unless otherwise noted.

Socioeconomic indicators included per capita annual income, percentage of the population who live below the poverty level, percentage of the noninstitutionalized population who are uninsured, percentage of households with no access to a vehicle, unemployment rate of persons ages 16 years and greater, and percentage of the population who are ages 25 and greater without a high school diploma.

The infectious disease indicators included the count of new HIV cases, HIV incidence rate, HIV prevalence rate, rate of HIV incidence through IDU transmission, rate of sexually transmitted infections (STI), rate of acute hepatitis B virus, and rate of acute hepatitis C virus.

Although not considered an indicator, counts of HIV-testing sites per county are included on the HIV vulnerability map.

Drug use indicators included the opioid-related inpatient admission rate, opioid-related ED visit rate, opioid prescription rate, opioid prescriptions greater than 90 morphine milligram equivalents (MME) rate, methadone-related inpatient admission rate, methadone-related ED visit rate, methamphetamine-related inpatient admission rate, methamphetamine-related ED visit rate, methamphetamine-related mortality rate, heroin-related inpatient admission rate, heroin-related ED visit rate, and heroin-related mortality rate.

County-specific information also included rural-urban status scaling (1 is most Urban—6 is most Rural), access to an interstate highway, and whether there is an urgent care facility in the county.

Population of Nevada (2019): 3,073,304[10]

Population Density of Nevada (2015-2017 Aggregate): 26.8 density/square mile[11]

Socioeconomic Data

Per Capita Annual Income[12]	$27,414.70
Population Below Poverty[13]	14.9%
Uninsured[14]	16.1%
Household with No Vehicle[15]	3.6%
Unemployment Rate (ages 16 and greater)[16]	9.3
Ages 25+; No High School Diploma[17]	8.5%

Infectious Disease Data

New HIV Cases[18]	1,488 cases
HIV Incidence Rate[18]	16.9
HIV Prevalence Rate[18]	368.0
HIV Transmission Through IDU Rate[18]	1.7
STI Rate[19,20]	679.1
Acute Hepatitis B Rate[20,21]	0.9
Acute Hepatitis C Rate[20,21]	1.0

Drug Use Data

Opioid-Related Inpatient Rate[22]	15.9
Opioid-Related ED Rate[22]	16.7
Opioid Prescription Rate per 100[23]	84.9
Opioid Prescriptions >90 MME Rate per 100[23]	14.6
Methadone-Related Inpatient Rate[22]	1.5
Methadone-Related ED Rate[22]	0.9
Methamphetamine-Related Inpatient Rate[22]	6.8
Methamphetamine-Related ED Rate[22]	5.0
Methamphetamine-Related Mortality Rate[24]	7.2
Heroin-Related Inpatient Rate[22]	2.4
Heroin-Related ED Rate[22]	10.0
Heroin-Related Mortality Rate[24]	2.9

County Specific Data

County	HIV Testing Site[25]	Rural-Urban Status[26]*	Access to Interstate[27]	Urgent Care Facility in County[28]
Carson City	2	4	Yes	Yes
Churchill	1	5	Yes	Yes
Clark	25	1	Yes	Yes
Douglas	1	5	No	Yes
Elko	2	5	Yes	Yes
Esmeralda	0	6	No	No
Eureka	0	5	Yes	No
Humboldt	0	5	Yes	Yes
Lander	0	6	Yes	Yes
Lincoln	0	6	No	Yes
Lyon	4	5	Yes	Yes
Mineral	0	6	No	Yes
Nye	0	5	No	Yes
Pershing	0	6	Yes	Yes
Storey	0	3	Yes	No
Washoe	7	3	Yes	Yes
White Pine	0	6	No	Yes

*1 is most Urban—6 is most Rural

Methods

Nevada has a small number of counties (n = 17), which posed a set of statistical challenges. Conventional practice sets p-value significance at $\leq$ 0.05. Due to the small sample size, there would have to be a large effect to show significance; therefore, a p-value significance was set at ≤ 0.1. Using SAS, a bivariate analysis was first performed with both continuous and categorical covariates to determine statistical significance. A Spearman's rank correlation was then used to assess multicollinearity. Many statistically significant covariates were also linearly correlated, and certain variables were eliminated from the assessment based on collinearity and correlation with the dependent variable. Stepwise regression was used to identify variables for inclusion in the final model.

Opioid-related death[24] was the dependent variable in assessing opioid vulnerability in Nevada. Thirty-three (33) indicators were identified and assigned as independent variables. These variables included opioid-specific data such as emergency department and inpatient overdoses[22]; socioeconomic data such as poverty rate[13] and unemployment rate[16]; and county-level specific data such as population density[11] and rural status.[26] Out of the 33 covariates, 14 were statistically significant. After running bivariate and stepwise regressions, two significant variables were identified: emergency department heroin overdoses (non-fatal)[22] and number of opioid prescriptions.[23] A ranking of the 17 Nevada counties were then calculated using these two covariates and the dependent variable, death from opioids[24], using generalized linear mixed modeling.

HIV incidence[18] was the dependent variable in assessing HIV vulnerability in Nevada. Thirty-five (35) indicators were identified and assigned as independent variables. These variables included HIV-specific data such as HIV incidence rate by injection drug use transmission[18] and acute hepatitis B and C rates[20,21]; socioeconomic data such as poverty rate[13] and unemployment rate[16]; and county-level specific data such as population density[11] and rural status.[26] Out of the 35 covariates, 21 were statistically significant. After running bivariate and stepwise regressions, one significant variable was identified: sexually transmitted infection (STI) rate. [19,20] A ranking of the 17 Nevada counties were then calculated using this one covariate and the dependent variable, HIV incidence[18], using generalized linear mixed modeling.

Findings

Opioid Overdose Vulnerability Findings

There were 1,203 opioid-related deaths from 2015 to 2017 in Nevada[24]. Of the 33 indicators for assessing opioid vulnerability in Nevada, 14 were found to have statistical significance, and two were ultimately used for modelling after running Spearman's correlations and stepwise regressions. The two (2) variables that were found to be most significantly associated with opioid deaths[24] in Nevada are emergency department overdoses[22] (p=0.035) and number of opioid prescriptions[23] (p= 0.006). The 17 Nevada counties were ranked in order of vulnerability, from most to least vulnerable.

HIV Vulnerability Findings

There were 1,488 new HIV diagnoses[18], 77 cases of acute Hepatitis B[20,21], and 85 cases of acute Hepatitis C[20,21] from 2015 to 2017 in Nevada. Of the 35 indicators for assessing HIV vulnerability in Nevada, 21 were found to have statistical significance, and one was ultimately used for modelling. The one variable that was found to be most significantly associated with HIV incidence in Nevada is STI rate[19,20] (p=0.0005). STI's included in the analysis were chlamydia, gonorrhea, primary syphilis, secondary syphilis, and early latent syphilis. The 17 Nevada counties were ranked in order of vulnerability, from most to least vulnerable.

Prevention Strategies

Opioid Spike Response Prevention Strategies

The state of Nevada has been working to identify overdose spikes, or clusters since 2017. The implementation of ODMAPS, and expansion of ImageTrend will help the state identify spikes or clusters in more real time. The DEA ODMAP program generates overdose spike alerts to help inform law enforcement, public health, and other stakeholders. As part of the DEA ODMAP implementation in Nevada, SAMSHA State Opioid Response dollars have been sub-granted to the community to support spike prevention planning.

To date, Nye County, Lincoln County, Esmeralda County, and Clark County have computed their jurisdictional overdose response plans. The jurisdictional vulnerability assessment will be provided to these communities for review. Counties will be encouraged to review the assessment to determine if they are at heightened risk, and modify their plans as needed.

CDC Overdose Data to Action (OD2A) grant funds will be used to support table top exercise development which will allow counties to bring together vested stakeholders to test their plans and identify any gaps in present stakeholders, in communication sharing, or in information sharing capabilities in the deployment of resources.

HIV and Hepatitis C Spike Response

In Nevada, there are three health authorities that work on HIV and Hepatitis prevention and intervention planning. The Washoe County Health District has authority over the state's northern urban population center. Southern Nevada Health District has authority over Clark County, the state's southern urban population center. The State of Nevada, Department of Health and Human Services, Division of Public and Behavioral Health, Office of Public Health Investigations and Epidemiology has the balance of the state, which includes all of our rural and frontier populations centers.

The HIV Surveillance and Prevention program has been working to draft their statewide cluster and outbreak plan for persons that inject drugs. Once finalized, this report will be shared with statewide stakeholders. The findings from this report will be provided to the local health authorities, as well as the State HIV Surveillance and Prevention program.

Endnotes

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