



Washington State Opioid Overdose Mortality: A Comparison of Three Rural Counties

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INTRODUCTION AND REPORT OBJECTIVE

Since 1999, opioid dependence and overdose mortality in the United States has been on the rise, a phenomenon now termed the opioid “epidemic.” Between 1999 and 2016, the U.S. saw a 300 percent increase in opioid-related deaths.¹ The economic impact has been equally substantial, with a single-year estimated cost of about \$504 billion in lost lives, emergency medical response, treatment services, and law enforcement efforts.² Despite several initiatives to address high mortality, deaths only marginally decreased in the past few years, and are expected to increase in the near future due to the COVID-19 pandemic and economic crisis.^{3,4}

Compared to other states, Washington State (WA) has fared reasonably well in terms of opioid overdose mortality. Although WA has seen far fewer opioid-related deaths than most states, statewide opioid misuse and related mortality have substantially increased since 2000.⁵ At this time, the Washington State Department of Health (WA DOH) began tracking the state and county-level effects of and responses to the opioid epidemic. WA DOH now regularly collects data and updates recommendations on opioid overdose mortality, hospitalizations, and prescriptions. The state formally enacted the [Washington State Opioid Response Plan](#) in 2016 with the following goals: prevent opioid misuse and abuse; identify and treat opioid use disorder; prevent deaths from overdose; and use data to detect opioid misuse/abuse, monitor illness, injury and death, and evaluate interventions.

WA DOH currently reports two opioid overdose deaths per day statewide.⁶ However, there is significant geographic variation.⁷ This variation is especially pronounced in rural counties, which comprise the majority of the state geographically. Although opioid overdose mortality is roughly equal in rural versus urban areas, there are several factors that make addressing the opioid epidemic much more challenging in rural places.⁸ The variation present among WA State counties suggests that each rural county has its own unique risk factors, demonstrating a need for an opioid overdose mortality report sensitive to intra-rural context.

This comparative report examines opioid overdose mortality rates in three rural Washington State counties and explores how county characteristics may contribute to opioid overdose mortality. County characteristics are divided into four categories: comorbidities; overdose prevention and opioid dependence treatment; healthcare and provider access; and socioeconomic factors. A brief history and description of each county is provided to account for historical and geographic contexts. The overall objective of this report – to further understand why certain rural counties experience greater opioid overdose mortality - aligns with several initiatives presented in the [Washington State Opioid Response Plan](#).

METHODOLOGY AND DATA SOURCES

The data in this report were restricted to the 2013-2017 period whenever possible, as this was the most recent estimate available for the majority of report measures. There are discrepancies, indicated by the years listed for each measure. Data were age-adjusted whenever possible. Age-adjustment is a statistical technique – often applied to rates or percentages of health indicators – that accounts for the different age structures of communities being compared.⁹ Age-adjustment considers the age structure of the indicator itself, as the frequency of health outcomes differs for specific age groups. Each measure was adjusted for population size (per 10,000 population, per 100,000 population, or percent of population) using population estimates from the U.S. Census Bureau American Community Survey (ACS). A statewide value is included with every measure as a baseline for comparison. This report includes self-reported data, which may create problems with recall and social desirability bias.¹⁰ It is important to note that the data and findings from this report represent a cross-sectional, snapshot understanding of opioid overdose mortality.

Opioid Overdose Mortality by County

The opioid overdose mortality data presented in this report were obtained from the Washington Tracking Network (WTN), an open-access data repository managed by the WA DOH. The data available through the WTN comes from various sources, including the WA DOH, the U.S. Census Bureau, and other state agencies. The most recent five-year estimates for fatal opioid overdose rates (2013-2017) were used for this report.

County Characteristics

As described, county characteristics were divided into four categories: comorbidities; overdose prevention and opioid dependence treatment; healthcare and provider access; and socioeconomic factors. Data on the prevalence of comorbidities were obtained from the WTN and the online, GIS-friendly data warehouse, [PolicyMap](#). Data on overdose prevention and opioid dependence treatment were obtained from the University of Washington Alcohol and Drug Abuse Institute (UWADAI), WA DOH syringe service program and pharmacy listings, and the Substance Abuse & Mental Health Services Administration (SAMHSA). Healthcare and provider access data came from the WTN, as well as the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute [County Health Rankings & Roadmaps \(CHRR\)](#) website. Data on county-level socioeconomic factors were obtained from the ACS, WTN, and CHRR.

County Selection

Clallam, Chelan, and Walla Walla counties were selected for this report given their rurality, similar population sizes, and regionality. Given that most Washington State counties are considered rural by WA DOH, rural counties were selected to better reflect the overall characteristics of Washington State. Additionally, populations in rural places often experience unique challenges associated with opioid use, demonstrating a need for a deeper understanding of opioid overdose mortality in these areas. County geographic variation may

elucidate any regional differences contributing to opioid overdose mortality rates. Further, this approach considers how rural places may differ from one another. Selecting three counties for comparison rather than all counties in Washington allows for a more deliberate, comprehensive understanding of opioid overdose mortality in these areas. For opioid overdose mortality and health information on the counties excluded from this report, please visit the [WTN dashboard](#).

COUNTY DESCRIPTIONS

Clallam County

Clallam County is located in northwestern Washington, forming the northern section of the state's Olympic Peninsula. The 2019 estimated population was 77,331, with most residents in the cities of Port Angeles, Sequim, and Forks.¹¹ Clallam County is home to the Klallam, Makah, and Quileute peoples, who were the original occupants of the county and are crucial to its future.¹² Historically, logging and timber production were the main industries due to the vast expanse of western hemlock, red cedar, and other coniferous trees. However, the introduction of strict environmental regulations in the 1980s reduced operations.^{12,13} This left a lasting impact on Clallam County, as unemployment rose considerably.¹³ Healthcare and service industries are now the primary employers.¹⁴ Tourism is popular due to the county's natural amenities such as Olympic National Park. Although Clallam County is considered rural, the major cities of western Washington are close by.

Chelan County

Chelan County is located in central Washington, in the shadow of the Cascade Mountains. The 2019 estimated population was 77,200, with populations centers in Wenatchee and Chelan.¹¹ The county drew much of its identity from Lake Chelan, the Wenatchee River, the Chelan River, and the Entiat River. Irrigation from these water sources transformed the once arid valley into an agricultural hub, famous for its Washington apples.¹⁵ While hydroelectric power development played a significant role in the county's history, agriculture was and still is the primary industry in the county.^{15, 16} The healthcare sector is also a major employer.¹⁶ Booming wine tourism and several resort towns, such as the Bavarian-themed Leavenworth, consistently draw visitors to the county and supplement its economy. Like Clallam County, Chelan County is not far from Seattle given its shared border with King County.

Walla Walla County

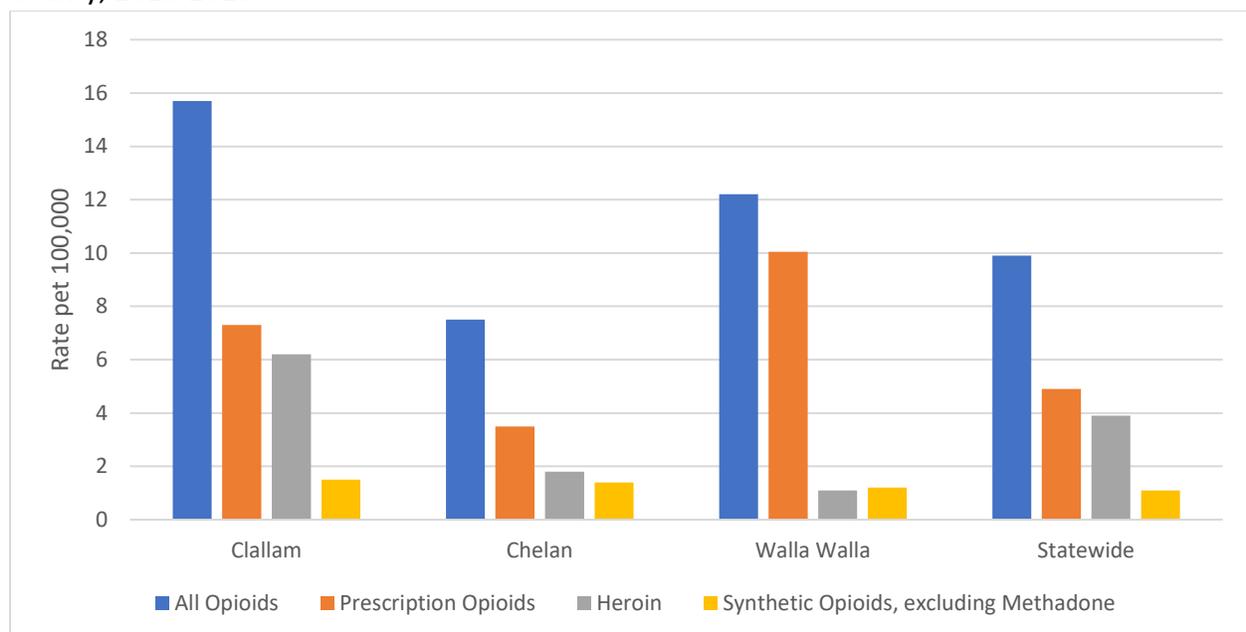
Walla Walla County is located in southeastern Washington, complete with rolling hills and wheat fields to match the surrounding area. The 2019 estimated population was 60,760 with most residents in the four incorporated cities of Walla Walla, Prescott, College Place, and Waitsburg.¹¹ The county owes its establishment to military operations and a short-lived gold rush in the mid 1800s.^{17,18} Agriculture, especially the cultivation of wheat, onions, and wine grapes, and healthcare are the most substantial industries in the county.¹⁷ Higher education is a vital industry in the county, serving as the home of Whitman College, Walla Walla University, and Walla Walla Community College.¹⁹ Due to a history of agriculture and the climate of the Walla Walla Valley, wine tourism in the county has flourished in recent years.¹⁸ Unlike Clallam and Chelan counties, Walla Walla County is relatively isolated from major urban areas.

OPIOID OVERDOSE MORTALITY

Figure 1.1. displays opioid overdose mortality rates for the selected counties during the 2013-2017 period. The trends emphasize the geographic variation in overdose mortality among rural counties in Washington. Clallam Co. experienced the highest opioid overdose mortality rate of the three selected counties, with a rate of 15.70 deaths per 100,000 population. Walla Walla Co. followed closely with a rate of 12.20 deaths per 100,000 population. Chelan Co. reported the lowest overdose mortality rate with 7.5 deaths per 100,00 population.

The type of opioid involved in an overdose matters for developing effective solutions. If county-level trends in opioid type mirror those at a national level, county-level solutions can draw from national ones. The national trend in opioid abuse suggests that prescription opioids are often replaced by heroin due to cost or prescription regulations¹. In recent years, heroin has been displaced by synthetic opioids for their cheaper price and increased potency. Fig. 1.1 tells a different story at the county-level. Prescription opioids accounted for the greatest number of deaths in all three counties and WA generally. Although to a different degree, Clallam and Chelan Co. opioid types were similar to the statewide trend. However, prescription opioid use was the primary driver of overdose mortality in Walla Walla Co. by a significant margin, despite the robust statewide prescription monitoring program. This highlights the necessity of local-level policies and solutions, as geographic location can influence the types of opioids available in each county.

Figure 1.1 Overdose deaths, 5 year age-adjusted rate per 100,000 population, by substance and county, 2013-2017



Data Source: Washington Tracking Network (WTN); Data accessed October 2020

EXPLANATORY FACTORS

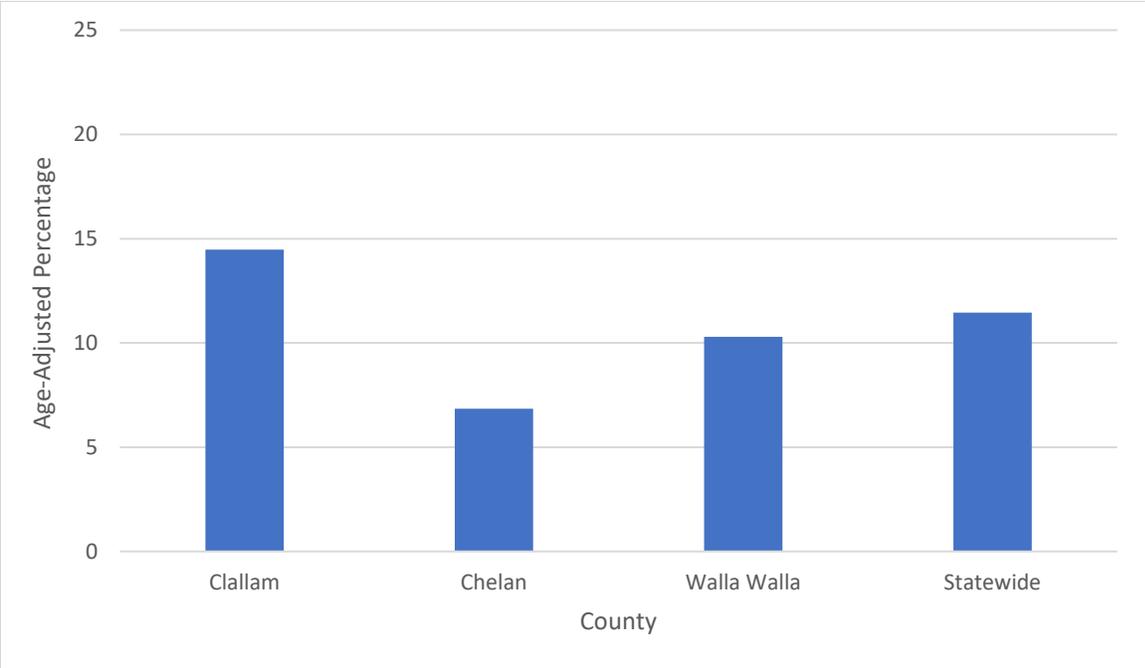
COMORBIDITIES

The World Health Organization (WHO) has identified several comorbidities for opioid dependence that increase risk of an overdose. These include mental health conditions, human immunodeficiency virus (HIV), and other substance use.²¹ In addition to opioid overdose, several of these comorbidities are linked to the larger phenomenon of “deaths of despair,” or death by suicide, drug and alcohol poisoning, and lung or liver cancer.⁸ Deaths of despair are often much greater in rural areas, presenting important implications for the three selected counties.²²

Mental Health

Poor mental health is highly correlated with general substance use and overdose mortality.²³ Opioids are used to alleviate mental distress and often have serious interactions with psychiatric medications, which increases the likelihood of an overdose.²¹ Clallam Co. had an elevated percentage of adults with poor mental health when compared to the state average and other two counties (Figure 2.1). This suggests that improving access to mental healthcare and alleviating the sources of mental distress could reduce opioid overdose mortality.

Figure 2.1 Age-adjusted percent of adults who reported poor mental health during the past 30 days, by county, 2012-2016

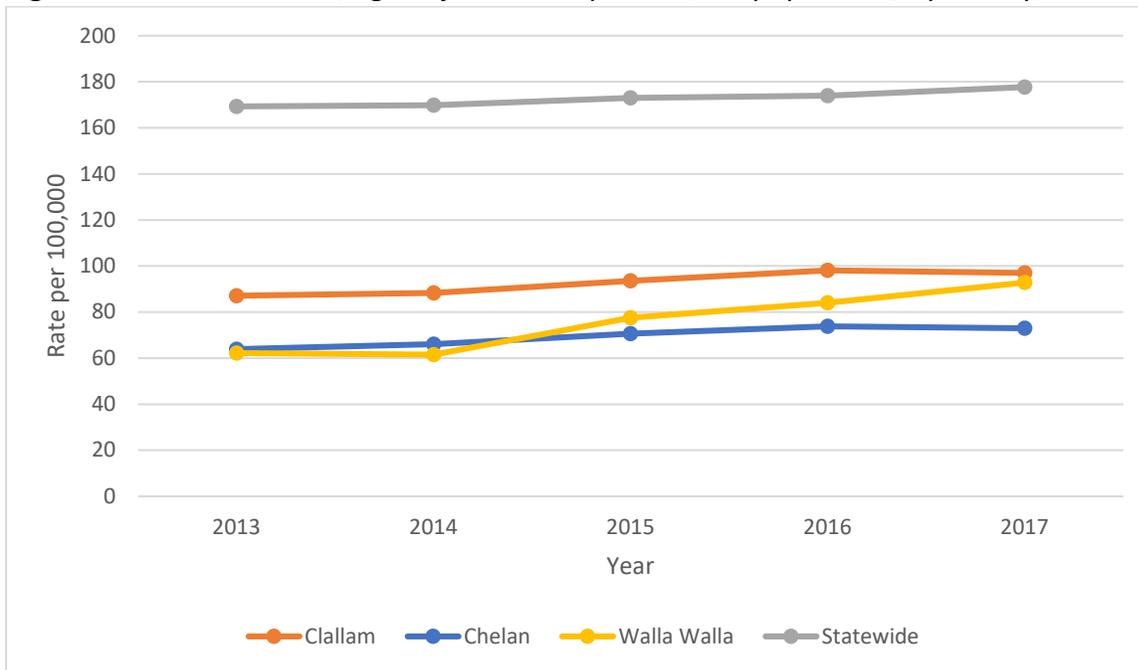


Data Source: Washington Tracking Network (WTN); Data accessed October 2020

Human Immunodeficiency Virus (HIV)

HIV and drug use have been inextricably linked since the onset of the HIV/AIDS epidemic.^{23,24} Although all three counties were below the state average for HIV prevalence, Figure 2.2 shows a slightly elevated rate in Clallam Co. and in Walla Walla Co. more recently. Since HIV can be both a product of drug use and a risk factor for overdose, it is difficult to confirm that HIV prevalence contributed to opioid overdose mortality in Clallam and Walla Walla counties.

Figure 2.2 HIV Prevalence, age-adjusted rate per 100,000 population, by county, 2013-2017



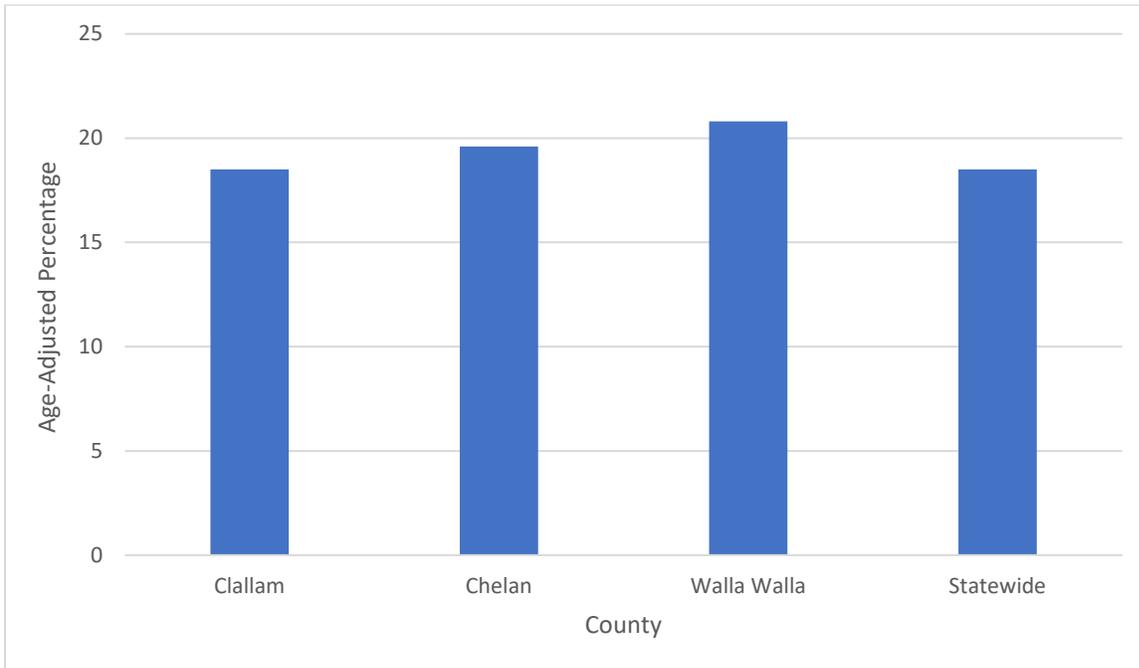
Data Source: Washington Tracking Network (WTN); Data accessed November 2020

Other Substance Use – Heavy Drinking and Smoking

Using opioids in combination with alcohol increases the risk of an overdose, as alcohol enhances the respiratory-depressing effect of opioids.²⁵ Excessive alcohol consumption further increases this risk. Figure 2.3 shows heavy drinking was slightly elevated in Chelan and Walla Walla counties compared to the state average, but not elevated in Clallam Co. This indicates excessive alcohol consumption may not provide a clear explanation for the 2013-2017 opioid overdose mortality trend.

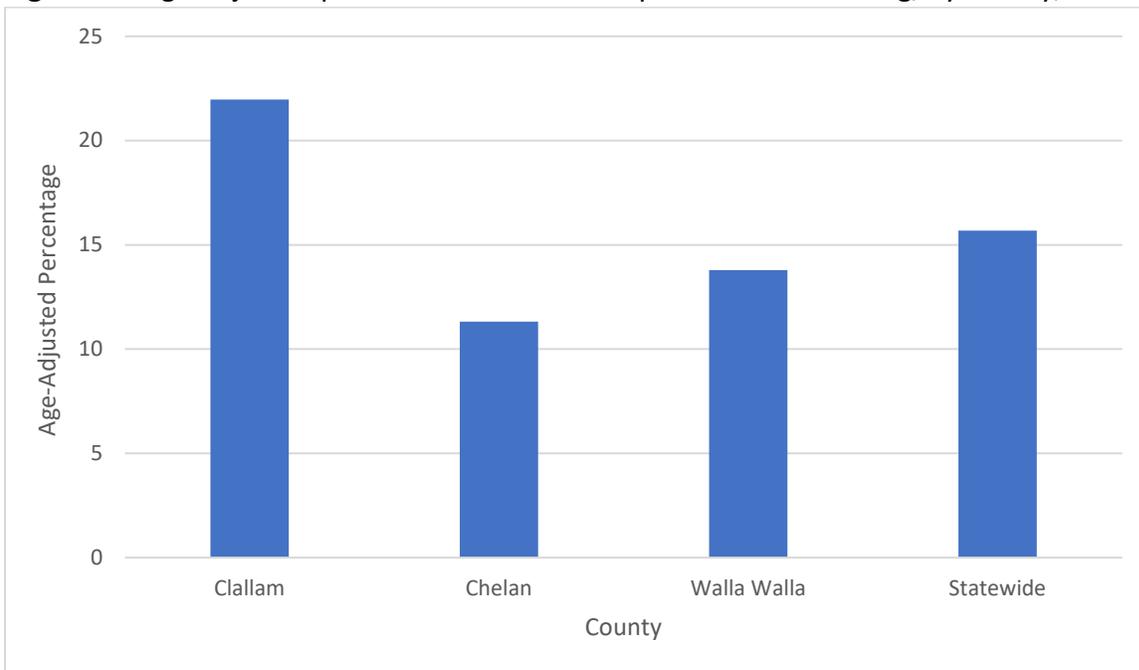
Figure 2.4 shows that Clallam Co. had a much greater percentage of current smokers compared to the state average and the other two counties. Although the physiological link between smoking and overdose is unclear, smoking rates may serve as an indicator for socioeconomic conditions that lead to opioid dependence.^{26,27} Therefore, to address opioid dependence and overdose mortality, we can consider how these conditions relate to others with similar socioeconomic risk factors.

Figure 2.3 Age-adjusted percent of adults who report heavy drinking in the last 30 days, by county, 2018



Data Source: PolicyMap and CDC BRFSS; Data accessed February 2021

Figure 2.4 Age-adjusted percent of adults who report current smoking, by county, 2012-2016



Data Source: Washington Tracking Network (WTN); Data accessed October 2020

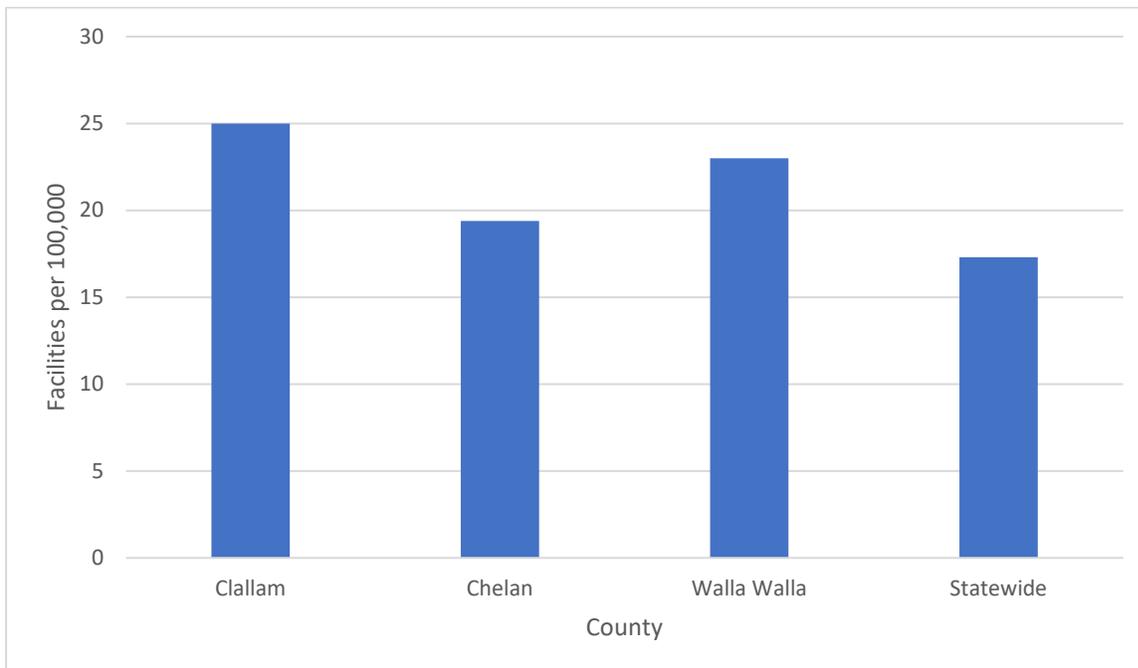
OVERDOSE PREVENTION AND OPIOID DEPENDENCE TREATMENT

The following section explores access to services intended to prevent opioid overdoses and treat opioid dependence. The following are evidence-based strategies and often apply the [harm reduction approach](#) to drug use.

Overdose Prevention: Naloxone Distribution

Naloxone is an opioid antagonist that can reverse the effects of an opioid overdose within minutes if delivered properly. Although it does not solve the underlying causes of opioid dependence, naloxone is an important tool for decreasing the prevalence of fatal overdoses. In addition to community providers, pharmacies in each county were included in this measure to account for the [Statewide Standing Order to Dispense Naloxone](#). Figure 3.1 depicts naloxone access points in each county, and shows that counties with greater overdose mortality had a greater number of access points. Although the counties with the greatest need for naloxone had more of it, the data suggest increased prevalence of naloxone may not be as vital to reducing overdose mortality overall.

Figure 3.1 Naloxone access points (including pharmacies) per 100,000 population, by county, 2019

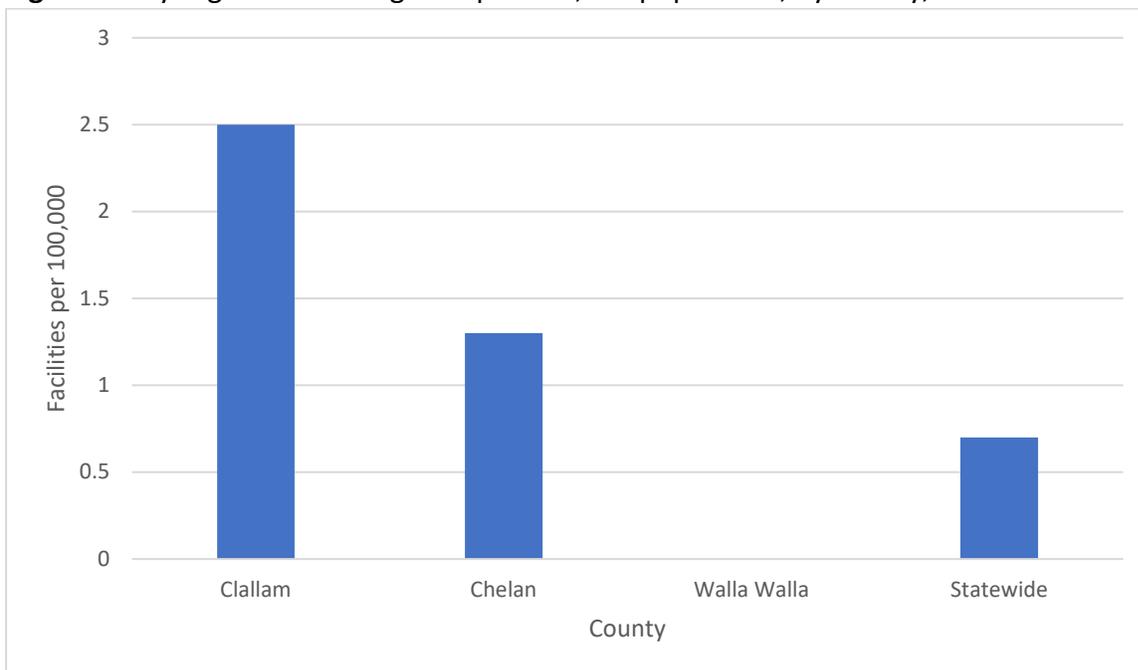


Data Sources: UWADAI, WA DOH; Data accessed October 2020

Harm Reduction: Syringe Service Programs (SSPs)

Syringe service programs (SSPs) are community-based public health programs that provide essential, nonjudgmental services to individuals who use syringes, often for intravenous opioid use.²⁸ These programs decrease the likelihood of overdose mortality by reducing the transmission of life-threatening diseases and by easing individuals into treatment. In general, these programs are scarce across Washington State, especially in rural places.²⁸ Figure 3.2 shows Clallam and Walla Walla counties had more of these providers compared to the state average. Since opioid overdose mortality was driven primarily by prescription opioids in the selected counties, it is unclear how effective SSPs were during the 2013-2017 period. While SSPs are essential for some individuals with opioid dependence, they may have been an inadequate use of county resources at the time.

Figure 3.2 Syringe Service Programs per 100,000 population, by county, 2019



Data Source: WA DOH; Data accessed October 2020

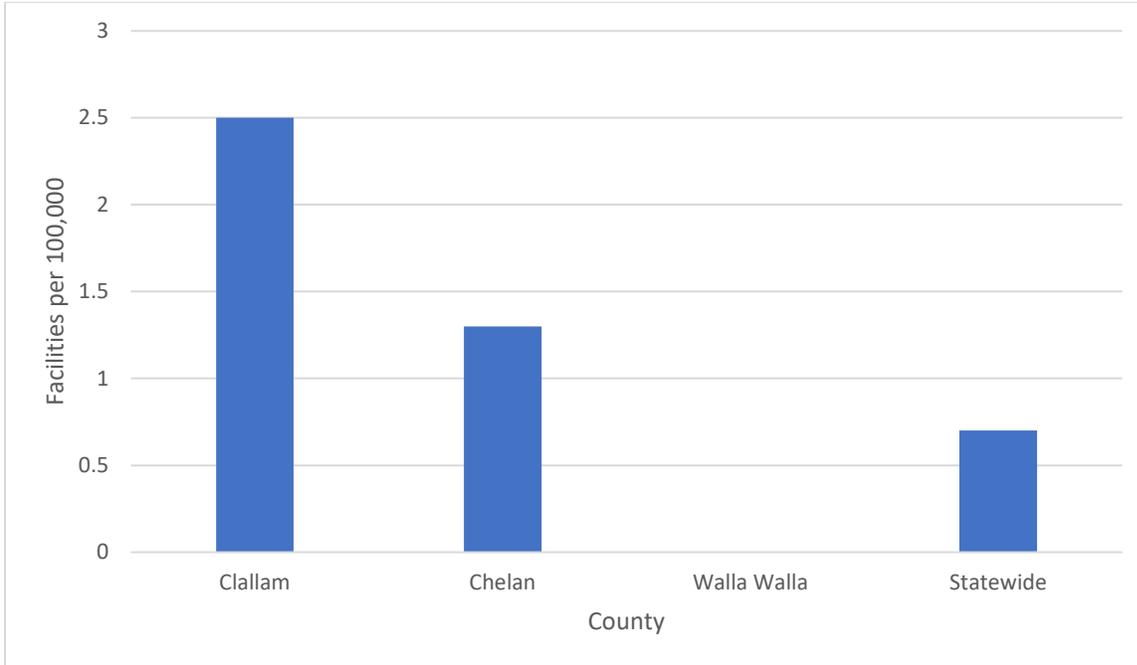
Opioid Dependence Treatment: Detoxification and Office-Based Buprenorphine Treatment (OBBT)

Access to treatment can significantly reduce the likelihood of opioid overdose. Without supervised detox programs to help ease withdrawal symptoms, individuals are more likely to relapse or have an adverse reaction.²⁹ Medication-assisted treatment (MAT), such as office-based buprenorphine (OBBT) and methadone, have proven effective for the treatment of opioid dependence.³⁰ OBBT is a viable treatment option in rural counties because residents may not need to travel long distances to treatment facilities as frequently.

Clallam and Chelan counties had the greatest number of treatment services, likely due to proximity to major urban areas. However, detoxification facilities, OBBT, and other MAT options are severely lacking in the selected counties, across the state, and in rural places across the U.S.^{31,32} Opioid Treatment Programs (OTPs) – the only legal point of access for methadone –

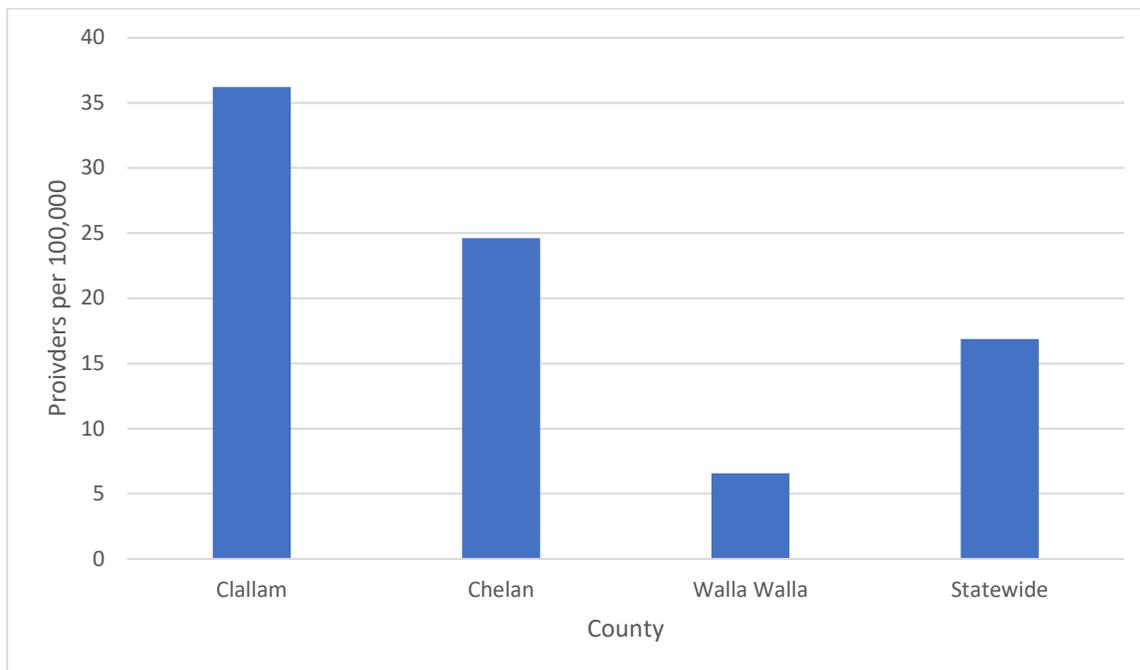
were excluded from the report because there were no OTPs in the selected counties. Additionally, only 2.2 percent of all U.S. physicians are legally able to prescribe buprenorphine, and about 90 percent of these providers are in urban areas.³³

Figure 3.3 Detoxification Facilities per 100,000 population, by county, 2019



Data Source: SAMHSA; Data accessed November 2020

Figure 3.4 Office-Based Buprenorphine Treatment Providers per 100,000 population, by county, 2019

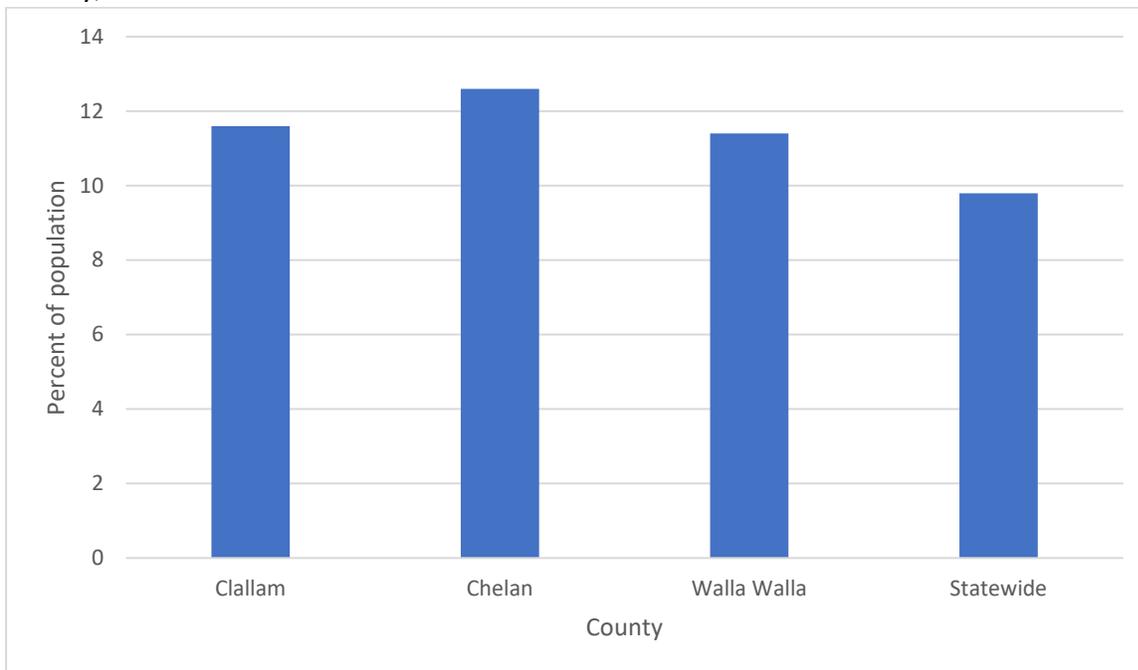


Data Source: SAMHSA; Data accessed October 2020

HEALTHCARE AND PROVIDER ACCESS

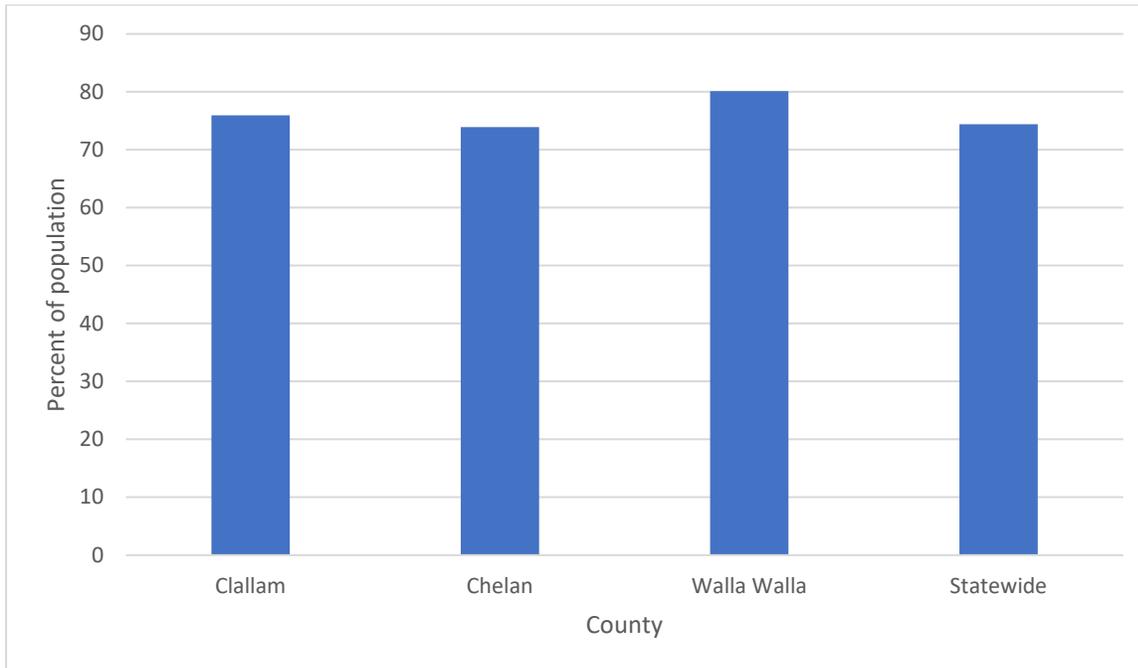
Rural places and their residents often have limited access to basic and emergency healthcare services. This may be attributed to inadequate insurance coverage and limited healthcare providers in these areas. Insurance coverage is essential for opioid dependence treatment and routine care, both of which reduce overdose risk. Additionally, primary care providers often perform the initial diagnosis and treatment of opioid dependence and its comorbidities.^{4, 34} Figures 4.1 and 4.2 demonstrate little variation in insurance rates and healthcare provider use between the three selected counties. While these measures might not explain county variation in opioid overdose mortality, they are worth examining to gain a comprehensive understanding of the selected counties.

Figure 4.1 Percent of population under age 65 without health insurance, 5-year estimate, by county, 2013-2017



Data Source: countyhealthrankings.org; Data accessed November 2020

Figure 4.2 Percent of adults who reported having a personal health care provider, 5-year estimate, by county, 2012-2016



Data Source: Washington Tracking Network (WTN); Data accessed October 2020

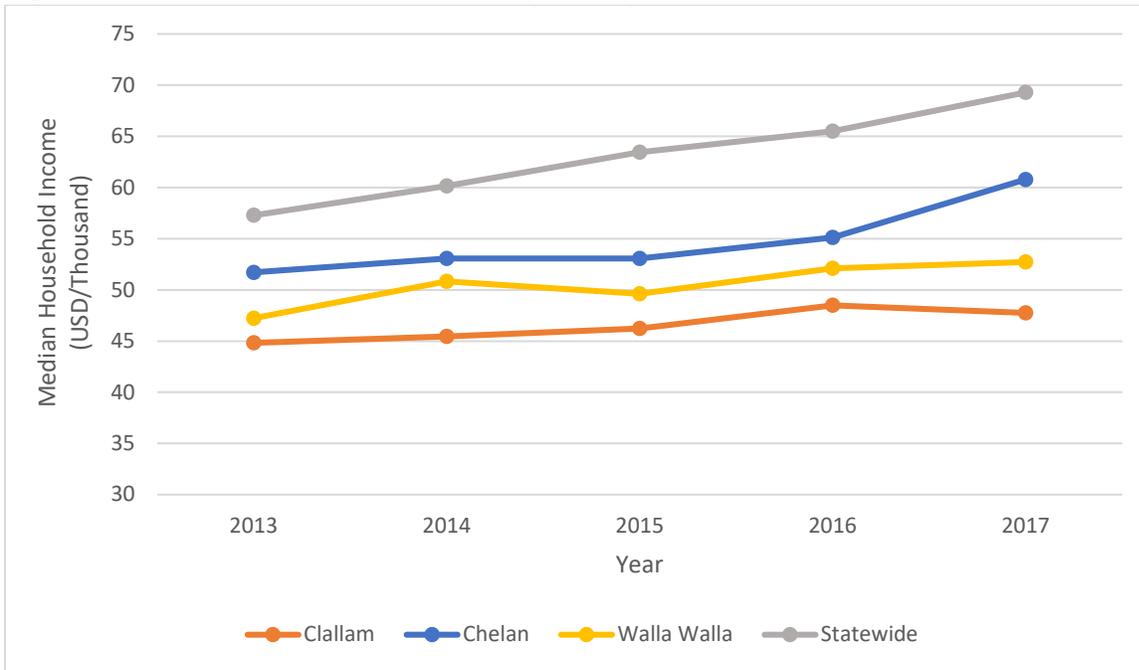
SOCIAL AND ECONOMIC FACTORS

The following section explores socioeconomic and social capital measures. These factors are often called the social determinants of health, as they provide insight about the ways in which social factors, like access to socioeconomic opportunities or the structure of our communities, affect our health.³⁵

Income and Education

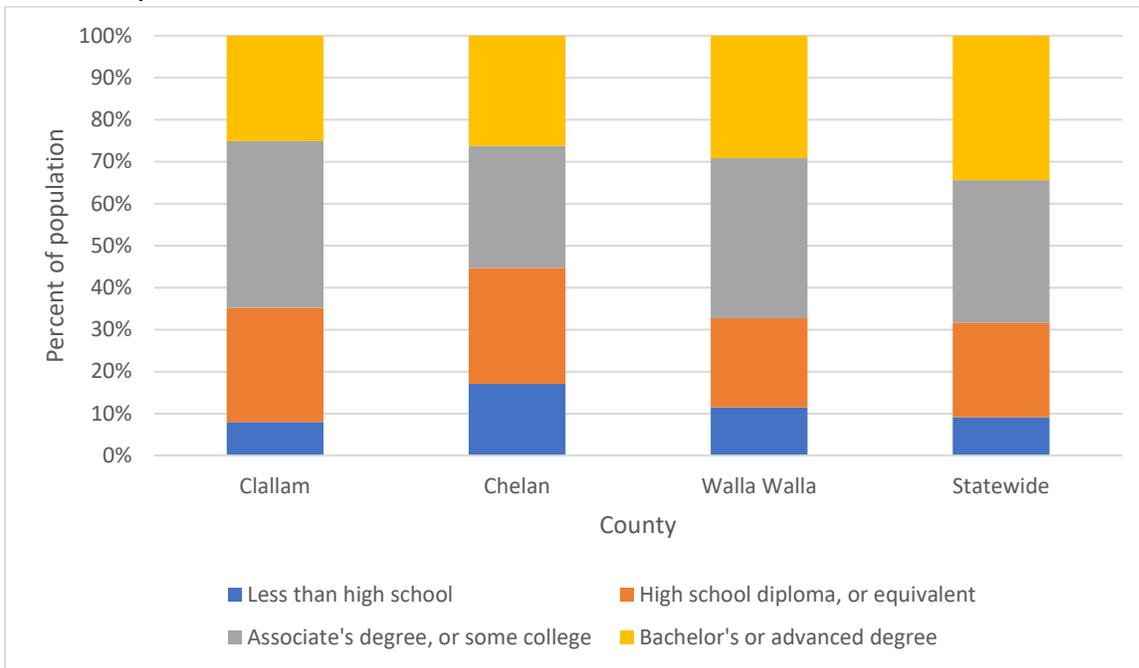
Socioeconomic status – often measured through income and educational attainment – has an inverse relationship with both opioid overdose mortality and overall health. Individuals in lower income brackets often have an increased risk of substance use in response to stress, hopelessness, and lack of control.²⁹ Additionally, educational attainment is strongly associated with health and opioid overdose mortality, as those with less education are often less healthy and more likely to suffer a fatal overdose compared to those with higher education.^{10,36} Figure 5.1 shows that all three counties had median household incomes (MHI) below the state average. However, Clallam Co. – which had the highest overdose rate – had the lowest MHI. Figure 5.2 shows little variation in educational attainment between the three counties. Chelan Co. had the greatest percent of the population without a high school diploma, but the lowest overdose mortality rate.

Figure 5.1 Median Household Income, by county, 2013-2017



Data Source: Washington Tracking Network (WTN); Data accessed October 2020

Figure 5.2 Educational attainment for population 25 years and over, 5-year estimate, by level and county, 2013-2017

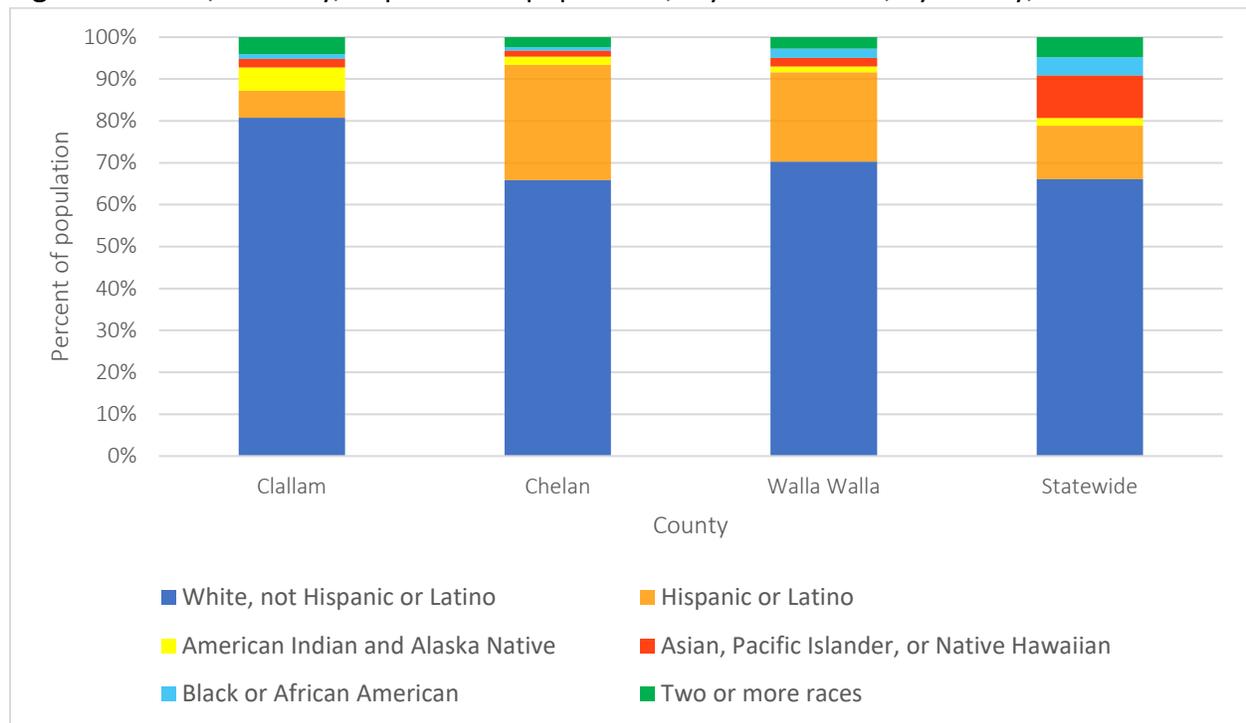


Data Source: American Community Survey (ACS); Data accessed November 2020

Race and Ethnicity

In Washington State and across the U.S., significant racial disparities exist for opioid overdose mortality. Therefore, the racial and ethnic compositions of each county matter. American Indians and Alaska Natives have a significantly higher opioid overdose mortality rate compared to all other racial/ethnic groups in Washington State²⁰. This partially matches the national trend for rural areas, with American Indian/Alaska Natives and Whites having the highest mortality rates⁸. As Figure 5.3 depicts, Clallam Co. has a significant American Indian/Alaska Native population (5.6% of population), which may contribute to the higher opioid overdose mortality rate in the county.

Figure 5.3 Race/Ethnicity, as percent of population, 5-year estimate, by county, 2015-2019

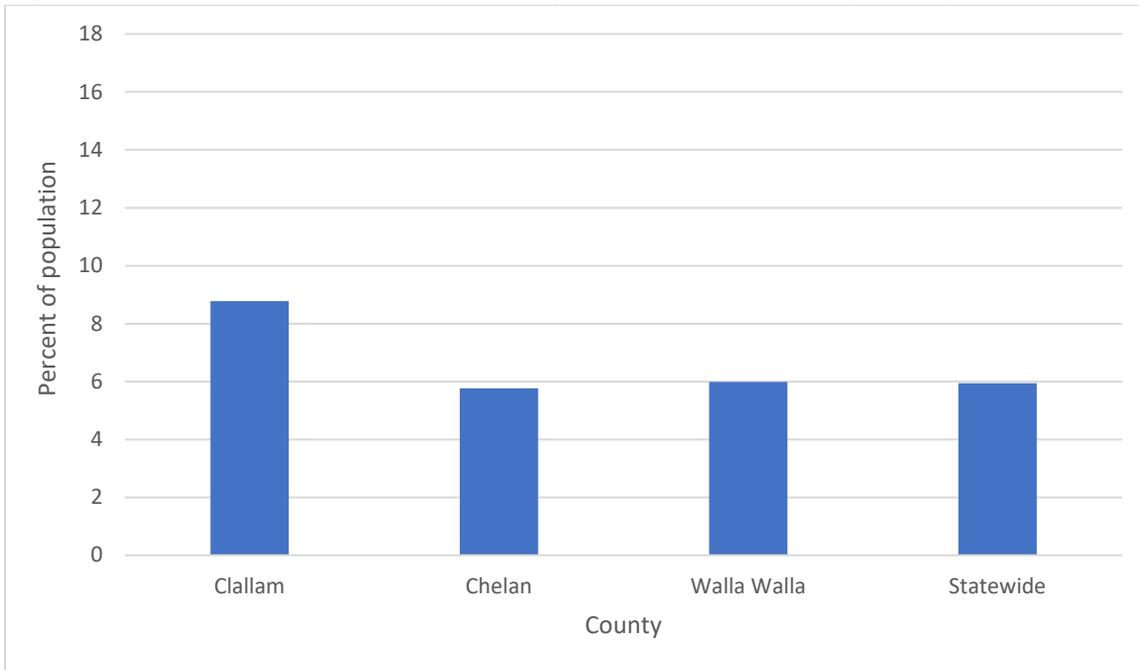


Data Source: US Census Bureau; Data accessed November 2020

Unemployment and Poverty

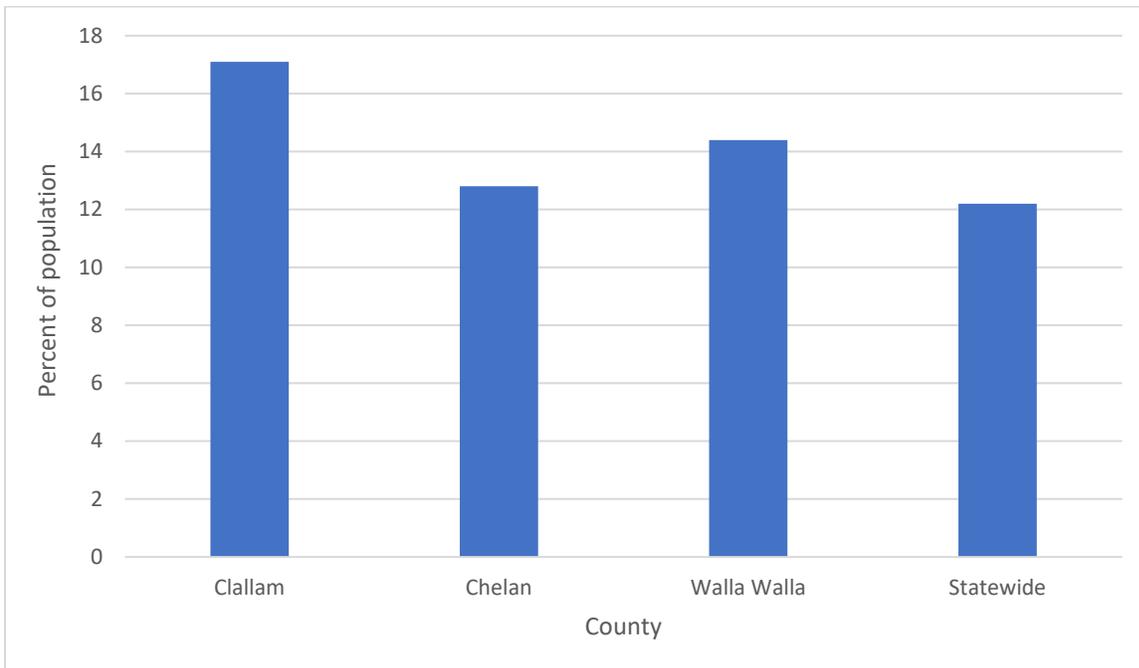
High levels of poverty and unemployment are strongly associated with increased opioid use and opioid overdose mortality. Those experiencing economic insecurity suffer from social and economic exclusion, barriers to social mobility, and lower levels of emotional wellbeing. To manage this distress, substance use increases.^{8,37} Clallam Co. had elevated poverty and unemployment rates compared to the state average and other two counties. This may offer an economic explanation for the high opioid overdose mortality rate in Clallam Co. There is also historical significance to this measure given the 1980s deindustrialization period within the county and the resulting impact it left on residents.

Figure 5.4 Percent of Population Unemployed, 5 year estimate, by county, 2013-2017



Data Source: Washington Tracking Network (WTN); Data accessed October 2020

Figure 5.5 Percent of individuals living below poverty level, 5 year estimate, by county, 2013-2017



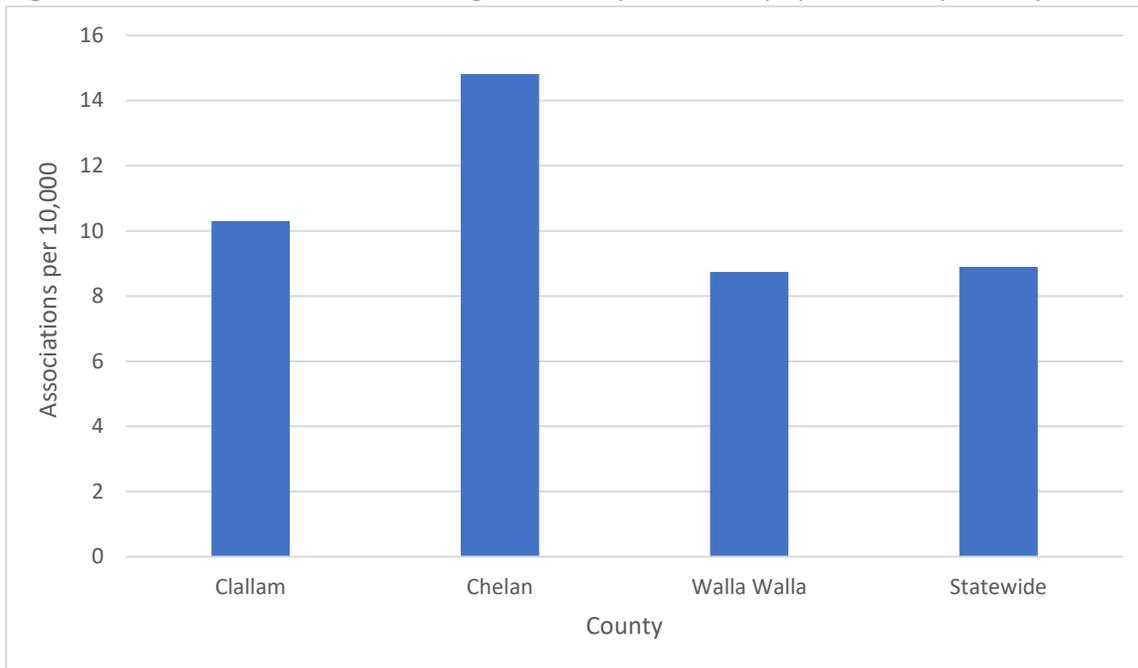
Data Source: Washington Tracking Network (WTN); Data accessed October 2020

Social Capital: Social Associations and Civic Participation

Although social capital has several definitions and orientations, this report examines structural social capital, or one’s involvement in the community through organizations or voting.³⁸

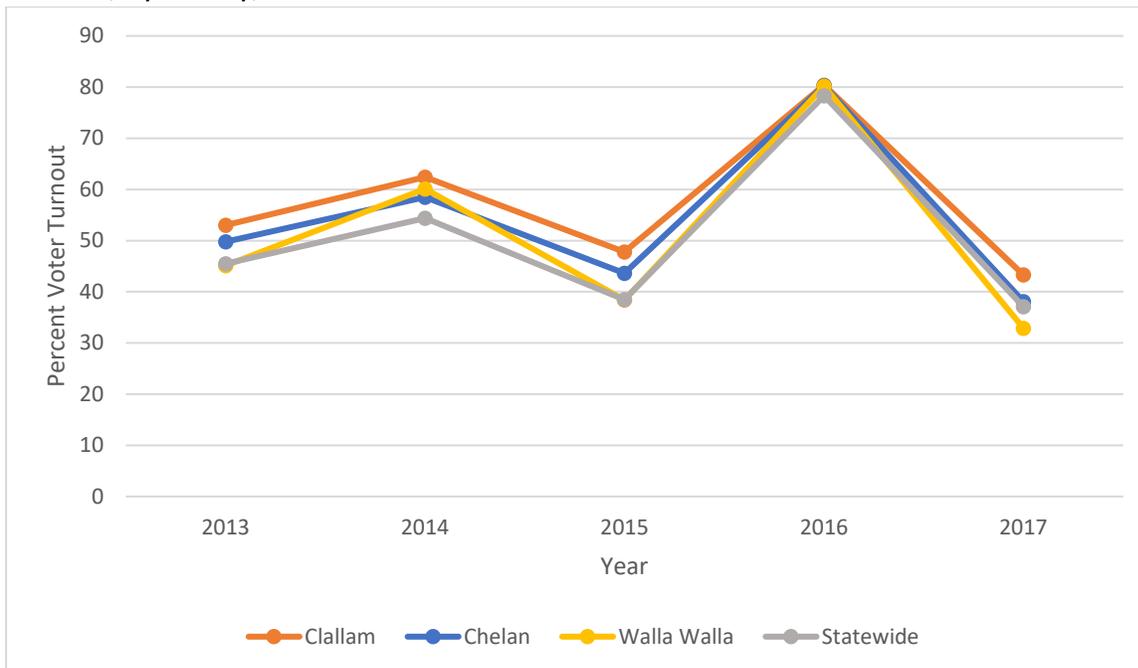
Community organizations provide opportunities for social interaction, and facilitate relationships, trust, goodwill, and social cohesion, all of which may buffer against substance use.²⁹ Figure 5.6 shows that Chelan Co. had the greatest population-adjusted number of social associations. Chelan Co. also had the lowest opioid overdose mortality rate. This suggests a protective effect of social capital. However, no conclusions can be drawn about voter turnout, as county percentages were quite similar (see Fig. 5.7).

Figure 5.6 Social associations, average number per 10,000 population, by county, 2013-2017



Data Source: countyhealthrankings.org; Data accessed October 2020

Figure 5.7 Civic participation as voter turnout, percent of eligible voters who voted in a general election, by county, 2013-2017



Data Source: Washington Secretary of State; Data accessed November 2020

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Opioid use and overdose mortality are multifaceted issues that require equally thoughtful, evidence-based solutions. The variation in opioid overdose mortality rates within and between rural Washington counties presents additional complexity we have yet to fully understand. The objective of this report was to further our efforts to understand county-level mechanisms behind opioid overdose mortality in Clallam, Chelan, and Walla Walla counties. While there is never a single explanation for overdose mortality patterns, there are several medical, public health, and social factors that play a significant role.

As reported, Clallam Co. had an overdose mortality rate well over the state average for the 2013-2017 period, followed closely by Walla Walla Co. Chelan Co. fell below the state average during this time period. High rates of poor mental health and other substance use in Clallam and Walla Walla counties provided insight about the presence comorbidities that contribute to increased opioid dependence and the likelihood of fatal overdose. Lacking treatment and overdose prevention services in every county, as well as Washington State generally, suggested a surface-level area for improvement focused solely on immediately saving lives. Poverty and unemployment in Clallam Co. – likely biproducts of deindustrialization from decades before use – were considerably higher at this time compared to state averages. Additionally, Clallam and Walla Walla counties had far less social capital – or community/social engagement – compared

to Chelan county. The factors explored in this report may begin to unearth the root causes of opioid dependence and overdose mortality in rural areas of Washington.

The vast majority of policy and public health efforts to reduce opioid overdose mortality focus on factors similar to those outlined in the opioid dependence treatment and overdose prevention services category of this report. While these evidence-based initiatives are vital for saving lives, they are not and cannot be our only solution for overdose mortality. Often, these initiatives fail to address the fundamental causes of opioid dependence and overdose risk. It is important that we recognize how the opioid epidemic is situated within the larger, interconnected context of health and socioeconomic structure.⁸ The factors explored in this report should inform the development of policy, research, and overdose prevention efforts in order to save lives and remedy the conditions that made lives in need of saving. Furthermore, these efforts should be mindful of local context – or place-specific causes and trends – in their creation and implementation. Finally, it is imperative that we begin to recognize and address the fundamental causes of opioid dependence as a preventative, rather than reactive strategy for the expected surge in opioid overdose mortality due to the COVID-19 pandemic.^{3,4}

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