NEVADA DIVISION of PUBLIC and BEHAVIORAL HEALTH

NEVADA HEPATITIS B AND HEPATITIS C ELIMINATION PLAN

(2021-2025)

Nevada Department of Health and Human Services

Division of Public and Behavioral Health

Office of State Epidemiology

Hepatitis Surveillance and Prevention Program

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PURPOSE AND EXECUTIVE SUMMARY

Hepatitis B and Hepatitis C are serious global public health threats responsible for significant morbidity and mortality. In the United States, approximately 800,000 people are living with hepatitis B and 2.4 million people are living with hepatitis C. While there were significant national decreases in hepatitis B and hepatitis C incidence in the early 2000's, the incidence of hepatitis C rose drastically in the 2010's. [1].

Building upon previous national viral hepatitis prevention strategies, the US Department of Health and Human Services recently released the *Viral Hepatitis National Strategic Plan: A Roadmap to Elimination 2021 – 2025* to provide a national framework for reducing the incidence of new viral hepatitis infections and ultimately eliminating hepatitis in the United States by 2030. This roadmap serves as a guide for states and localities to use as they develop tailored hepatitis elimination efforts [2].

In 2021, the Nevada Division of Public and Behavioral Health (DPBH) and the Larson Institute for Health Impact and Equity at the University of Nevada, Reno (UNR) School of Public Health collaborated to initiate the development of a viral hepatitis elimination plan for the State of Nevada. A Viral Hepatitis Technical Advisory committee was formed in 2021 to guide the development of this plan and includes representatives from public health systems and community-based organizations throughout the state (see acknowledgements). This committee reviewed the national strategies for viral hepatitis elimination and developed actionable, state-specific goals and objectives to guide elimination efforts in Nevada.

The Nevada Hepatitis B and Hepatitis C Elimination Plan was developed collaboratively by the Nevada Viral Hepatitis Technical Advisory Committee and the Larson Institute for Health Impact and Equity at the University of Nevada, Reno.

DEMOGRAPHIC AND SOCIOECONOMIC PROFILE OF THE STATE OF NEVADA

In 2020, Nevada had a population of 3,104,614 [3]. The state is geographically the 7th largest state and the 31st most populous state in the country. It is comprised of 17 counties spread across 109,831 square miles and a water area of 710 square miles [3]. Clark County, home to Las Vegas, comprises nearly three-quarters of the state's population (72.3%). Washoe County, home to Reno, makes up 15.2% of the population, while all other counties comprise the remaining 12.5% of the population.

Table 1, below, compares population characteristics between Nevada and the United States. Nevada has a higher proportion of residents who are Hispanic/Latino and foreign-born residents compared to the United States. The percentage of adults with a Bachelor's degree and the median household income are lower in Nevada compared to the United States. Nevada also has a higher proportion of residents without health insurance and a slightly higher proportion of persons living in poverty compared to the United States.

Nevada's economy has grown exponentially, making it the fifth fastest growing state in the country. The state's key industries include mining, aerospace & defense, information technology, manufacturing & logistics, health, natural resource technologies, and tourism & gaming [4]. Of these key industries, the most common employment sectors fall into the tourism & gaming category – restaurants & food services, amusement & recreation, and traveler accommodation. Despite the relatively small population of Nevada, in 2019 over 55 million tourists visited the state [5]. That same year, these three employment sectors amounted to roughly 31% of the 1.41M people in the workforce [4]. Among those working in the tourism & gaming sector, 32% are Hispanic or Latino. With a large portion of the workforce providing services rather than producing goods, Nevada may be more vulnerable to infectious disease transmission.

Table 1. Population characteristics of Nevada and the United States [3].

		Nevada	USA		
Population	Population, percent change - April 1, 2020 (estimates base) to July 1, 2022	2.4%	0.6%	NV	↑
Age and Sex	Persons under 5 years, percent	5.7%	5.7%		
	Persons under 18 years, percent	22.2%	22.2%		
	Persons 65 years and over, percent	16.5%	16.8%	USA	↑
	Female persons, percent	49.6%	50.5%	USA	↑

Race and Hispanic Origin	Black or African American alone, percent	10.6%	13.6%	USA	
	Hispanic or Latino, percent	29.9%	18.9%	NV	
	White alone, not Hispanic or Latino, percent	46.6%	59.3%	USA	
Population Characteristics	Foreign born persons, percent, 2017-2021	19.2%	13.6%	NV	
	Language other than English spoken at home, percent of persons age 5 years+, 2017-2021	29.9%	21.7%	NV	
Housing	Owner-occupied housing unit rate, 2016-2020	57.8%	64.6%	USA	
	Median gross rent, 2017-2021	$1,238	$1,163	NV	
	Persons per household, 2017-2021	2.65	2.60	NV	
Education	High school graduate or higher, percent of persons age 25 years+, 2017-2021	87.0%	88.9%	USA	
	Bachelor's degree or higher, percent of persons age 25 years+, 2016-2020	26.1%	33.7%	USA	
Health	Persons without health insurance, under age 65 years, percent	13.7%	9.8%	NV	
Economy	In civilian labor force, total, percent of population age 16 years+, 2017-2021	63.0%	63.1%	USA	
	In civilian labor force, female, percent of population age 16 years+, 2017-2021	58.4%	58.7%	USA	
Income & Poverty	Median household income (in 2021 dollars), 2017-2021	$65,686	$69,021	USA	
	Per capita income in past 12 months (in 2021 dollars), 2017-2021	$34,621	$37,638	USA	
	Persons in poverty, percent	14.1%	11.6%	NV	

HEPATITIS B VIRUS (HBV) AND HEPATITIS C VIRUS (HCV) IN NEVADA

In Nevada, reporting of reactive/positive Hepatitis A, Hepatitis B, acute and chronic Hepatitis C, perinatal, acute, and chronic Hepatitis C, negative results, Hepatitis Delta Hepatitis E, and Hepatitis, unspecified testing is mandated. While reporting of non-reactive/negative tests was historically not mandated, legislative changes effective in December of 2023 now mandate the reporting of negative tests. NAC/NRS 441A requires that laboratories report HCV test results to the local health authority (LHA). Reporting currently occurs by both electronic and manual transmission. The Electronic Laboratory Capacity grant is being utilized to onboard all labs to report electronically. Recent additions to NAC 441A in December 2023 also outline electronic reporting requirements for labs. Currently, most major labs such as LabCorp and Quest report electronically. For more details on hepatitis surveillance and reporting, please see: https://dpbh.nv.gov/uploadedFiles/dpbh.nv.gov/content/Programs/STD/dta/Providers/Regulations.pdf

In 2018, there were a total of 126 newly-reported chronic HBV cases, 4,256 newly-reported chronic HCV cases, 23 cases of acute HBV, and 19 cases of acute HCV (Table 2).

Table 2. The number of acute and newly-reported chronic cases of hepatitis B virus (HBV) and hepatitis C virus (HCV), 2014-2018, Nevada.

		2014	*2015*	*2016*	*2017*	*2018*
Hepatitis B Virus (HBV)	Acute HBV	21	25	22	30	23
	Chronic HBV	73	76	87	98	126
	Hospitalization associated with HBV	373	373	512	626	636
	Deaths associated with HBV	10	18	23	13	20
Hepatitis C Virus (HCV)	Acute HCV	6	12	16	35	19
	Chronic HCV	738	945	971	1374	4256
	Hospitalization associated with HCV	4579	4817	4915	4947	4984
	Deaths associated with HCV	181	173	181	153	140

Note: Data retrieved from Nevada Hepatitis Epidemiologic Profile: 2018. Nevada Division of Public and Behavioral Health.

The number of co-occurring conditions related to HBV and HCV hospitalization appear to be relatively common (Table 3). The most common co-occurring diagnoses were drug use, type 2 diabetes, liver disease, and alcohol use. The prevalence of co-occurring conditions for HBV and HCV highlights the syndemic, or co-occurring epidemics, consisting of substance use, HIV infection, and viral hepatitis.

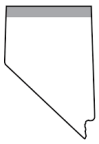
Table 3. Co-occurring diagnoses among hospitalizations for patients with hepatitis B virus (HBV) and hepatitis C virus (HCV), 2018, Nevada.

	Hepatitis B Virus (HBV)		*Hepatitis C Virus*	
Co-occurring Diagnoses Listed	Number of hospitalizations	Percentage of all hospitalizations	Number of hospitalizations	Percentage of all hospitalizations
Drug Use	131	21%	1849	37%
Type 2 Diabetes	186	29%	1425	29%
Liver Disease	168	26%	1441	29%
Alcohol Use	94	15%	1203	24%
Liver Cirrhosis/Fibrosis	122	19%	1163	23%
HIV Infection	64	10%	256	5%
Liver Cancer	40	6%	166	3%
Liver Transplant	11	2%	37	1%
Total co-occurring diagnoses	816		7540	
Total hospitalizations	**636**	**100%**	**4984**	**100%**

Note: Data retrieved from Nevada Hepatitis Epidemiologic Profile: 2018. Nevada Division of Public and Behavioral Health.

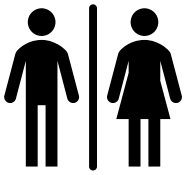
Epidemiologic Overview on HBV an HCV in Nevada

HBV



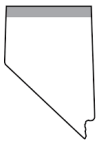
The rate of new acute HBV cases is highest in Clark, Carson, Douglas, and Lyon Counties, whereas the highest rate of newly-diagnosed chronic HBV is in Washoe County.

Rates of HBV have continued to remain low in Nevada since universal vaccination of infants began in 1999, and only one case of acute HBV was observed in those under the age of 25.



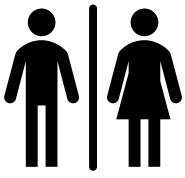
Men have 1.4 times the rate of both acute and chronic HBV incidence. Both acute and chronic HBV are common among adults older than 45 years of age. Those who identify as Asian or Pacific Islanders are disproportionately affected by HBV, and from 2014 to 2018, they had the highest rate of chronic HBV.

HCV



In 2018, 74.2% of acute HCV cases and 70.7% of chronic HCV cases were in Clark County. However, the rate of newly-reported chronic HCV were the highest in Carson, Douglas, and Lyon Counties in with the highest rate among men.

From 2017 to 2018, the rate of reported Chronic HCV infection increased by 205.2% from 46.0 to 140.4 cases per 100,000 population which may be caused by increasing injection drug use related to the opioid crisis and improved surveillance methods



Males have higher rates of acute (1.8 times) and chronic HCV (1.7 times) diagnoses compared to females. Males also had higher rates of hospitalization than women for all years between 2014 and 2018.

Note: Data retrieved from Nevada Hepatitis Epidemiologic Profile: 2018. Nevada Division of Public and Behavioral Health

VIRAL HEPATITIS STRATEGIC PLAN FOR NEVADA

What is elimination?

Elimination represents the control of a previously prevalent communicable disease by reducing case transmission to a predetermined low level, although not necessarily to zero. The aim is to achieve a situation where the infecting agent cannot sustain itself in the population or, it has an elimination threshold of less than 1 case per 10,000 population, until the disease no longer presents a major public health problem.

Vision

Our vision is that Nevada will be a place that strives to significantly reduce viral hepatitis transmission and that every person with viral hepatitis has access to high-quality health care, treatment, and resources, and lives free from stigma and discrimination. This vision is centered around health equity and is inclusive of all Nevadans, regardless of age, sex, gender identity, sexual orientation, race, ethnicity, religion, disability, geographical location, or socioeconomic circumstance.

Values

Our values support the vision of this plan and include:

- Access to quality health care and treatment for all persons living with viral hepatitis B and hepatitis C
- Cultural competency
- Health equity
- Combating stigma and discrimination
- Community participation and engagement
- Holistic and integrated strategies

Goals

The five overarching goals of the Nevada Hepatitis B and Hepatitis C Elimination Plan are presented below. The goals are in direct alignment with the national goals presented in the U.S. National Viral Hepatitis Strategic Plan. Each goal includes a set of objectives and measurable evaluation metrics to guide planning and prevention efforts.

Goal 1	Improve viral hepatitis surveillance and data usage
Goal 2	Prevent new viral hepatitis infections
Goal 3	Improve viral hepatitis–related health outcomes of people living with viral hepatitis
Goal 4	Reduce viral hepatitis–related disparities and health inequities
Goal 5	Achieve integrated, coordinated efforts that address the viral hepatitis epidemics among all partners

Figure 1. Hepatitis Elimination Goals, Nevada

Goals, Objectives, and Metrics

Goal 1: Improve Viral Hepatitis Surveillance and Data Usage	
Purpose	High quality data helps to understand the true scope and level of public health threats and allows for follow-up of trends.
Objective/Strategy	
Objective 1.1	Improve public health surveillance through data collection, case reporting, and investigation at the state and jurisdiction health department levels Facilitate reporting through electronic case reporting and health information technology Increase capacity to investigate acute and chronic infections, respond to outbreaks, and capture data related to viral hepatitis risk factors and health outcomes Improve the quality and completeness of clinical and laboratory data, including on race, ethnicity, and country of birth (long-term) Explore mechanisms for building capacity to collect data about other relevant risk factors
Evaluation Metrics	Document challenges and gaps pertaining to data quality and completeness and propose solutions Evaluate outbreak response plan annually # of new acute and chronic HBV and HCV cases % of case investigations for HBV and HCV that are complete (minimum required variables)
Objective 1.2	Improve reporting, sharing, and use of clinical viral hepatitis data Develop and promote standardized data collection strategies to collect, analyze and share information on viral hepatitis b and c incidence, prevalence, care, treatment, and cure Develop a draft of an HBV continuum of care and HCV care cascade based on current capacity
Evaluation Metrics	% of case investigations for HAV, HBV, and HCV that are complete Develop draft of a viral hepatitis continuum of care and care cascade
Objective 1.3	Conduct routine analysis of viral hepatitis data and disseminate findings to inform public health action and the public Increase analytics and informatics capacity to monitor trends and data for priority populations Collect and monitor data on viral hepatitis incidence, prevalence, and deaths with HBV and HCV as an underlying or contributing cause

	Develop and publish viral hepatitis epidemiologic profiles Share surveillance data with decision-makers, health care providers, and community leaders
Evaluation Metrics	Develop annual viral hepatitis epidemiologic report Distribute report to key partners (can be included in collaborative report with HIV, other STIs, etc.) Develop viral hepatitis dashboard
Objective 1.4	Improve mechanisms to measure, monitor, evaluate, report, and disseminate progress toward achieving state goals Monitor, evaluate, and regularly communicate progress on viral hepatitis strategic goals and objectives according to an established schedule and address areas of deficiency Reduce reporting burden through improved coordination of reporting requirements
Evaluation Metrics	Document current challenges related to the burden of reporting requirements and identify potential solutions Develop evaluation report and share with key partners Distribute most recent hepatitis epidemiologic report to key partners (can be included in collaborative report with HIV, other STIs, etc.)

Goal 2: Prevent New Viral Hepatitis Infections	
Purpose	Prevention of new cases via increasing awareness, high-rate vaccination, elimination of perinatal transmission, and treatment of cases appropriately.
Objective/Strategy	
Objective 2.1	Increased awareness of viral hepatitis Distribute accessible, comprehensive, culturally, linguistically, and age-appropriate curricula for hepatitis B, hepatitis C, HIV, STIs, and substance use risk for youth and adults
Evaluation Metrics	Document the number of publicly available educational materials in the state (or within individual jurisdictions) Document the number of hepatitis-related outreach and prevention events in the state (or within individual jurisdictions) Identify and document state-specific needs for education, information, and outreach
Objective 2.2	Increase viral hepatitis vaccination uptake Provide viral hepatitis vaccination at a broad range of clinical and nontraditional community-based settings including HIV, STI, refugee health clinics, organizations that serve people who use drugs and/or people experiencing homelessness, and correctional facilities
Evaluation Metrics	Rate of hepatitis B vaccination (data-dependent) List community-based settings and agencies offering vaccination Identify and document gaps in vaccination efforts
Objective 2.3	Eliminate perinatal transmission of hepatitis B and hepatitis C Identify barriers to documenting pregnancy status on viral hepatitis laboratory reports across health care facilities, laboratories, and public health departments Educate providers, clinics, and hospitals about CDC guidance to screen all pregnant women
Evaluation Metrics	Document barriers to documentation of pregnancy status on viral hepatitis laboratory reports and identify potential solutions Report the number of positive tests for perinatal transmission, when possible Document educational resources available for providers to include CDC guidance and recommendations
Objective 2.4	Increase viral hepatitis prevention and treatment services for people who use substances Educate communities and individuals about substance use disorders, available prevention, harm reduction and treatment options, and associated risks including transmission of viral hepatitis, HIV, and STIs

	Expand access to viral hepatitis prevention and treatment services by providing screening, vaccination, and linkage to care in a broad range of health care delivery and community-based settings
Evaluation Metrics	Document community organizations providing viral hepatitis prevention and treatment services Identify publicly available resources and educational materials
Objective 2.5	Increase the capacity of public health, health care systems, and the health workforce to prevent and manage viral hepatitis Engage professional societies, academic institutions, and accrediting bodies in viral hepatitis prevention and care efforts to identify means to improve curriculum of medical and other health care professionals' and paraprofessionals' education and training programs
Evaluation Metrics	# of agencies/individuals represented in viral hepatitis advisory committee Assess the feasibility of hosting routine telehealth sessions with subject matter experts to provide individualized education and training for providers in Nevada

Goal 3: Improve Viral Hepatitis–Related Health Outcomes of People with Viral Hepatitis	
Purpose	Early diagnosis of and treatment for cases to prevent severe conditions.
Objective/Strategy	
Objective 3.1	Increase the number of people who are tested and aware of their viral hepatitis status Understand barriers that affect the ability to scale up implementation of universal hepatitis C screening guidelines among all adults and pregnant women in a range of clinical and nonclinical settings, and provide linkage to care Engage with relevant partners to identify innovative and feasible models for viral hepatitis testing in a range of settings such as community-based organizations, mobile units, substance use disorder treatment programs, correctional facilities, syringe services programs, HIV clinics, STI clinics, refugee health centers, and homeless shelters
Evaluation Metrics	Document educational resources made available for providers Document gaps and limitations pertaining to current testing landscape in the state Identify potential funding opportunities to support innovative and feasible models for increased viral hepatitis testing
Objective 3.2	Improve the quality of care and increase the number of people with viral hepatitis who receive and continue (hepatitis B) or complete (hepatitis C) treatment Educate people who are newly diagnosed about recommended assessment, vaccination, treatments, and the benefits of treatment adherence and completion, including in substance use disorder and correctional settings Improve linkage to care between community-based organizations, correctional facilities, syringe services programs, alcohol and other substance use disorder treatment programs, and viral hepatitis treatment providers
Evaluation Metrics	Document current practices related to linkage to care in our communities (e.g., case management practices) Develop draft of viral hepatitis care cascade
Objective 3.3	Increase the capacity of the public health, health care delivery, and health care workforce to effectively identify, diagnose, and provide holistic care and treatment for people with viral hepatitis Assess ways to expand hepatitis C screening and treatment capacity among public health, primary care and other health care providers, including pharmacists, to support the implementation of viral hepatitis testing, counseling, and treatment recommendations Expand and improve effectiveness of viral hepatitis navigation and linkage to care in programs that provide viral hepatitis outreach, screening, and treatment

Evaluation Metrics	Document areas for improvement related to HCV screening and treatment Identify potential funding opportunities for navigation and linkage services
Objective 3.4	Support the development and uptake of new and improved diagnostic technologies, therapeutic agents, and other interventions for the identification and treatment of viral hepatitis Promote the use of viral hepatitis point-of-care diagnostics and self-collection diagnostics
Evaluation Metrics	Identify funding opportunities to support increased use of viral hepatitis point-of-care diagnostics and self-collection diagnostics

Goal 4: Reduce Viral Hepatitis–Related Disparities and Health Inequities	
Purpose	Combating the disparities for awareness, diagnose and treatment of cases.
Objective/Strategy	
Objective 4.1	Reduce stigma and discrimination faced by people with and at risk for viral hepatitis Reduce stigma, unconscious bias, and discriminatory practices, including at health care delivery sites
Evaluation Metrics	# of providers who completed statewide cultural competency training
Objective 4.2	Reduce disparities in new viral hepatitis infections, knowledge of status, and along the cascade/continuum of care Explore mechanisms to provide testing and treatment of uninsured or underinsured people who are not able to afford them Foster partnerships with organizations that serve disproportionately impacted populations, including community organizations, provider organizations, academic institutions, and offices of minority health, to raise awareness of viral hepatitis
Evaluation Metrics	Document current availability of free testing and treatment of uninsured or underinsured people and identify potential mechanisms for increasing this capacity # of agencies/individuals represented in hepatitis advisory committee
Objective 4.3	Expand culturally competent and linguistically appropriate viral hepatitis prevention, care, and treatment services Explore mechanisms to train and educate health professionals in the delivery of culturally competent education, counseling, testing, care, and treatment for viral hepatitis, including development of appropriate informational and clinical decision support tools
Evaluation Metrics	Identify and document gaps in education, information, and outreach related to viral hepatitis Assess the feasibility of hosting routine telehealth sessions with subject matter experts to provide individualized education and training for providers in Nevada
Objective 4.4	Address social determinants of health and co-occurring conditions Support community leaders and people with lived experience to identify, plan, and implement efforts to meet the needs of their community related to viral hepatitis Address the co-occurring conditions of viral hepatitis such as HIV, STI, and substance use disorder services
Evaluation Metrics	# of non-traditional partners/organizations engaged with viral hepatitis advisory committee

Goal 5: Achieve Integrated, Coordinated Efforts That Address the Viral Hepatitis Epidemics among All Partners	
Purpose	Involvement of all organizations which can contribute the elimination activities.
Objective/Strategy	
Objective 5.1	Integrate programs to address the syndemic of viral hepatitis, HIV, STIs, and substance use disorders Work to align indicators and integrate surveillance data across programs and clinical service providers that address viral hepatitis, HIV, STI, and substance use disorder services Engage new partners from fields related to HIV, STIs, and substance use Identify and scale up viral hepatitis prevention, testing, linkage to care (with patient navigation), and treatment in all care settings that address the syndemic
Evaluation Metrics	# of providers reporting linkage outcomes-comparison from prior years Reports on data completeness-year-by-year comparison
Objective 5.2	Establish and increase collaboration and coordination of viral hepatitis programs and activities across public and private partners Explore the feasibility of coordinating and aligning strategic planning efforts on viral hepatitis, HIV, STIs, and substance use disorders across national, state, and local partners Encourage development of public-private partnerships to expand education, screening, vaccination, linkage to care, and treatment of viral hepatitis
Evaluation Metrics	Document areas of coordination and alignment of strategic planning efforts across health conditions across national, state, and local partners # of non-traditional partners engaged in viral hepatitis advisory committee

Strengths, Weaknesses, Opportunities, Threats to Hepatitis Elimination

To move Nevada toward viral hepatitis elimination, it is important to recognize the strengths, weaknesses, opportunities, and threats to viral hepatitis elimination. The Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis presented below came to fruition through formal discussion by the Nevada Viral Hepatitis Technical Advisory committee.

STRENGTHS

- Limited number of health jurisdictions
    - Easy to communicate and collaborate
    - Strong existing partnerships
- Community-based organizations and local heath districts
    - Utilize point-of-care tests for at-risk populations
    - Free screenings available
    - Offer full wrap around services, including linkage to care
    - Education and outreach for prevention
- Strong disease investigation teams
- High HBV vaccination rates
- Comprehensive testing and treatment plan through Nevada Department of Corrections

WEAKNESSES

- Severe lack of funding for hepatitis programs in the state
- Inconsistent surveillance tools/forms across the state
- Delays in receipt of treatment
    - Some providers do not treat immediately after initial diagnosis
    - Medication authorizations impacts patient's ability to get the medications they need
    - Patients may face difficulties accessing/paying for treatment
- Many positive cases are caught upon intake into justice system
    - Need to catch cases more upstream
- Many challenges to get high-risk populations screened
    - Stigma
    - Perceived barriers
- Need for more focused education and outreach

OPPORTUNITIES

- Strong willingness to eliminate viral hepatitis by health programs and policymakers
- Provide better health education for vulnerable populations may provide an opportunity to prevent infection and transmission
- Better data quality is possible with EpiTrax
    - Opportunity to generate good surveillance data and monitor trends in the future
    - Data sharing
- Development of regular reports, epidemiologic profiles, etc.

THREATS

- Severe lack of funding for hepatitis programs in the state
- Knowledge/stigma prevents patients from seeking care
- Risk of reinfection after a successful treatment regimen
- The scope of education on hepatitis is limited and stigmatized
- A small number of community agencies providing hepatitis-related services

One of the main strengths related to HBC and HCV elimination in Nevada is that there are only five health jurisdictions that cover the entire state, making communication and coordination of efforts relatively easy. Another strength is the existing community organizations that do hepatitis-related work in Nevada's communities. The greatest weaknesses and threats to hepatitis elimination in Nevada are that there is a lack of funding directed to hepatitis prevention, care, and treatment, and lack of a standardized surveillance system for hepatitis reporting.

Despite these weaknesses and threats to hepatitis elimination in Nevada, there are several important opportunities on the horizon to move our state closer to hepatitis elimination. First, Nevada is leveraging EpiTrax to support disease surveillance, which has improved data quality and allows for more streamlined data sharing. There is also an opportunity to opportunity to provide training and education to health care providers to improve access to treatment for Nevadans living with viral hepatitis.

PREVENTION STRATEGIES IN TARGET POPULATIONS

Recommended target groups for hepatitis eliminations strategies include [2]:

- People who inject drugs (PWID)
- Men who have sex with men (MSM)
- Patients engaged with drug treatment units
- Patients with advanced liver disease
- Hemophilia patients
- Children (vaccinations)
- Persons who are incarcerated
- Migrant populations from high prevalence regions
- Generational cohorts of high prevalence
- Geographically defined areas with high prevalence

Social Ecological Model for Health Promotion: Applications for Hepatitis Prevention, Treatment, and Care in Nevada

The social ecological model provides a framework for understanding various factors that can influence health across many domains of influence including individual factors, interpersonal factors, community factors, and societal factors (Figure 2). To move toward viral hepatitis elimination, it is paramount that prevention strategies are leveraged across multiple levels of the social ecological model [6]. Incidence of HBV and HCV is often the result of interacting factors across multiple levels of influence and prevention strategies should aim to address factors at each of these levels. For example, individual behaviors, such as injection drug use (IDU), can increase one's risk of contracting HCV. A multilevel intervention could include a combination of individual-level substance abuse counseling, implementation of support groups at the interpersonal-level, and community-level campaigns to reduce stigma surround injection drug use for the general population and among providers.

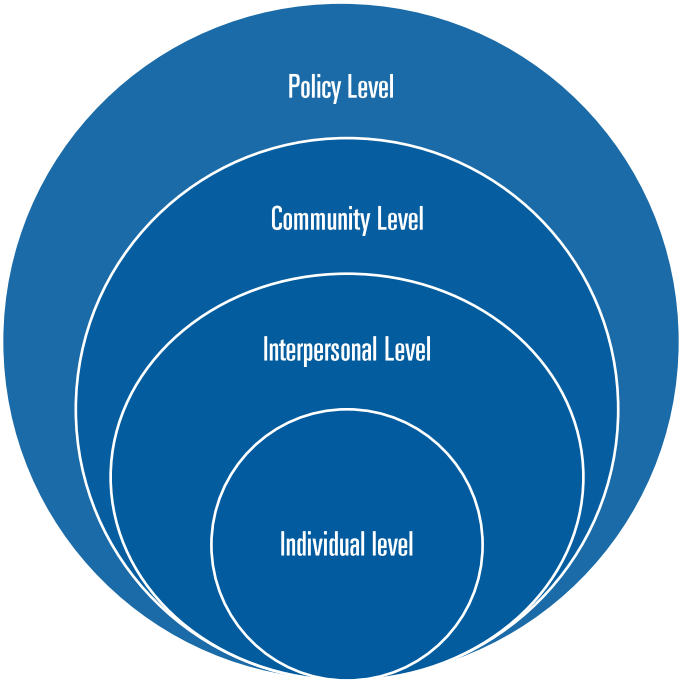


Figure 2. The social ecological model for health promotion.

Nevada Viral Hepatitis Needs Assessment

In late 2021 and early 2021, a brief, multi-faceted viral hepatitis needs assessment was conducted to understand barriers, challenges, and needs related to viral hepatitis prevention, treatment, and care in Nevada. The needs assessment included focus groups and key informant interviews. Given the nature of the COVID-19 pandemic and surging case numbers throughout the data collection period, many challenges related to recruitment and participation in the needs assessment arose leading to low community participation. However, the information collected in this assessment provides an initial look into the barriers, challenges, and needs related to viral hepatitis in Nevada.

The findings from this assessment were used to develop recommended strategies for elimination viral hepatitis in Nevada within the framework of the Social Ecological Model and in alignment with federal goals and objectives. A summary of each component of the needs assessment and recommended strategies for hepatitis elimination are outlined below.

Focus Groups

In late 2021, three focus groups were completed in partnership with community-based organizations serving at-risk populations in Nevada. Two focus groups were composed of community members from high-risk populations and focused on viral hepatitis prevention. One focus group was composed of people living with viral hepatitis and focused on treatment and care. The focus groups were transcribed and analyzed using a thematic analysis.

Several key themes were identified from the prevention focus groups:

Perceptions of risk

Injection drug use and risky sexual behaviors were common behaviors discussed in the focus groups. Use of shared needles or needles off the streets was mentioned as a relatively common occurrence, however, use of syringe services (e.g. Trac-B Exchange) and vending machines was also mentioned in a positive light. Unprotected sex was also a common occurrence. Generally, participants reported that their peers had low levels of concern about hepatitis transmission from these risky behaviors. In reference to needle use among their peers, one participant said*: "They'll use anything…. They just want to get high. The risk factor doesn't mean [anything] to them."*

Knowledge of hepatitis

In general, participants mentioned low levels of hepatitis knowledge among their peers. One participant even stated: "I don't even know what viral hepatitis is. I don't know how to get it. I have no information about it. I've never been talked to about it." Participants mentioned that much more was known about HIV compared to viral hepatitis. Further, there were misconceptions about hepatitis that were brought up by participants, including knowledge of vaccines and treatment for hepatitis.

Education

Interestingly, but not surprisingly, participants expressed that more resources were widely available for HIV compared to viral hepatitis. In the groups, not much was known about viral hepatitis statistics, transmission, and testing, highlighting that education is needed. Regarding specific types of education or information needed, one participant stated: "Just more advertisements letting people know to go get tested and like just get tested…like, to tell people the statistics, that it's on the rise. Information in general; anything is better than nothing."

Participants stated that providing more information and education is crucial, but that it needs to be done through more modern modes of communications, such as social media, YouTube, music streaming services, and dating apps. Community organizations that are trusted by high-risk populations were also mentioned as a valuable resource for hepatitis education.

Testing

One of the important prevention activities discussed in the focus groups was testing. Participants mentioned that they and their peers were not regularly testing and that greater access to free testing is needed, as well as education and information about testing. Again, much more was known in the groups about HIV testing compared to hepatitis testing. One participant even said: *"I've been tested for hepatitis C, B, and A through Clark County Detention Center. But if I wouldn't have ever gone to jail, I wouldn't have known about it."*

The following themes were identified from the treatment and care focus group:

Systematic challenges

One participant discussed the systematic challenges they experienced in receiving the hepatitis C diagnosis and beginning their treatment regimen. The participant was diagnosed at one location and was referred for treatment at a separate location. During the time of their diagnosis, the treating facility was shut down due to COVID-19, and the participant dealt with technological difficulties in setting up virtual appointments with the provider. Upon the treating office opening, the participant still could not settle into their treatment regimen due to difficulty getting to appointments. The participant's partner mentioned: *"I feel like we're always at the beginning."*

Stigma

Participants receiving treatment and care discussed stigma related to viral hepatitis. One source of stigma discussed was related to fear that viral hepatitis is incurable. One participant highlighted this stigma when discussing why they didn't seek testing sooner:

"Because it gets scary. You don't want to go. I know that's why I put it off forever, because I thought 'Oh my God, I'm going to get tested and they're going to tell me I'm dying, so why go?'"

Education

Participants expressed a need for education, specifically regarding treatment and preventing transmission to others for those who have viral hepatitis. One participant highlighted a need for spreading knowledge about *"where people know where to get help"*, because *"maybe people don't know where to look."*

Key Informant Interviews

In early 2022, key informant interviews were conducted with six health care providers who refer or treat patients living with viral hepatitis, including primary care providers from family practice office and community-based organizations, infectious disease specialists, and gastroenterologists. The purpose of these interviews was to speak with providers about challenges and barriers related to hepatitis prevention, treatment, and care from both the patient and provider perspective.

The following these emerged from these interviews:

Testing

Providers felt that testing was available, especially through community-based organizations and health districts, but felt that in general, we need to use innovative strategies to meet people where they are. Another interesting dimension that was brought up, which is alignment with HIV testing and treatment, is that immediate linkage to care is critical.

Treatment/Care

Providers generally agreed that managing treatment and care is simple, but the system and process creates many hurdles for patients. Several providers interviewed utilize care coordinators, medical assistants, and/or case managers and discussed the importance of these team members in treatment initiation and retention. One provider said: *"I actually have an MA (medical assistant) that helps me get the medications approved, and that has drastically helped as well. It used to take a month to get these meds approved, and we developed a worksheet, and I have a dedicated Medical Assistant to get all these meds approved, and it takes like a day now."*

One topic discussed by all providers was insurance and how that plays into treatment and care. In recent years, there have been significant improvements in getting treatments covered for uninsured patients, but providers reported that lab work was far more difficult to get covered and posed a significant financial barrier to patients. Even among insured

patients, providers cautioned that expensive copays can also factor into treatment initiation and adherence.

Education

Interestingly, providers not only discussed the importance of education for the high-risk populations and patients, but also provider-specific education. In regard to patient education, providers generally felt that more education was needed in the community and that trusted community partners and organizations were well-suited to address this challenge.

There was also discussion of provider-specific education. Among specialty providers, like infectious disease specialists or gastroenterologist, one provider mentioned that in their experience, stigma was a problem within the field: *"There is still probably a certain amount of stigma within, like the gastroenterology community, that says 'if someone is actively using [illicit drugs], I'm not going to treat them'. We need to take this [treatment] as more of a harm reduction strategy…and I think that's the education that needs to go out there. We're not here to change the behavior. That's not the purpose of this treatment."*

One provider also highlighted cultural competency training and education as an important tool for understand the unique needs of diverse populations: *"I think sometimes ethnic minorities might have a unique stigma that may not be understood, like by me or other providers, so I think some sort of education surrounding that would be good."*

Special populations

Providers highlighted important considerations for high-risk populations related to insurance, housing transportation, and reliable phone or internet access. To better serve those without stable housing, one provider suggested utilizing a "boots on the ground" approach to bring more testing and direct linkage to care to this populations and to also provide resources for those who require treatment: "*You can't really, if you're sleeping outside, have a month's worth of medication on you is not ideal, especially if it gets stolen. So maybe having a place where they can keep their meds, or dispensing medicine for a week at a time might be helpful for some of those folks."*

And it doesn't stop there. Providers also mentioned that providing reliable phone or internet access is also necessary and discussed challenges that his practice has in communicating and following up with those who do not have phone or internet access.

One provider summed up considerations for working with special populations by saying: *"Not everybody lives in your world, so you have to make sure you understand where your patients are living, and their support, and what they can and cannot do… You need to adjust your discussion with them [the patients] in terms they can understand. If you don't, in terms as a caregiver, you're falling behind with what you need to do."*

Avoid "missed opportunities"

Providers continually mentioned several "missed opportunities" that represent areas for improving access to testing, treatment, and care. One example of "missed opportunities" stems from testing at emergency rooms and urgent cares. High-risk individuals often seek care from emergency rooms and urgent cares, yet testing is not as common as it should be in these locations. Technically, emergency care providers are required by Nevada law to speak with patients about STD testing when seeking emergency services, but it is not understood how well enforced this law is among emergency providers.

Another significant "missed opportunity" arises when patients who seek testing from a primary care provider are referred out for treatment from another provider. One provider suggested education and training for primary care providers regarding hepatitis treatment, because more primary care providers should be providing treatment. However, one primary care provider who sees nearly one thousand patients mentioned that only a few have hepatitis and it doesn't make sense for that provider to manage their care.

One provider provided an ideal scenario for testing, treatment, and care: *"Having special viral hepatitis clinics in general, with a team-based approach, with a physician and even advanced practice providers can be doing a lot of the care for these patients and, kind of the monitoring, and hopefully, having somebody in terms of case management working with insurance companies doing the financials... would be ideal."*

Summary

In summary, this needs assessment highlighted key areas for community engagement to reduce the burden of viral hepatitis in Nevada, including improving education and resources related to hepatitis prevention (e.g. testing and stigma), providing training to providers to improve treatment and care, and fostering system-level changes to provide better support to high-risk populations and people living with hepatitis. While this assessment reveals that a great deal of work that needs to be done to improve hepatitis prevention and treatment in Nevada, it also shows that our communities care deeply about helping Nevada move towards viral hepatitis elimination. Figure 3 below highlights potential approaches to improve hepatitis prevention, treatment, and care across each level of the Social Ecological Model.

Policy Level

Public financing and policy implementation can either promote or inhibit the community's ability to provide preventive and harm reduction services.

- Legislation to treat and testing the individuals who have no insurance or underinsurance
- Policies to support harm reduction services
- Government assistance programs for cost-effective treatment
- Training of family physicians that are more accessible for patients

Community Level

The community environment can either promote health and well-being thorugh easy access to prevention, treatment and care servicesor be a source of stigma.

- Public health campaigns to encourage testing
- Free testing sites
- Education and training against stigma for both community and health care providers
- Train HIV educators on HCV
- Offer treatment training for family providers

Interpersonal Level

Interpersonal relationship with family, friends, neighbors and others can influence health.

- Support groups for those in close relationships with infected populations
- Social support to reinforce protective norms

Individual Level

Individual behaviors and traits, such as biological and behavioral factors, are directly associated with one's ability or risk to acquire or transmit infection.

- Substance abuse counseling
- HCV antiviral therapy
- Health education and promotion to understand risk perception

Figure 3. Suggested approaches to hepatitis prevention, treatment, and care across levels of the Social Ecological Model

CONCLUSIONS

Viral hepatitis b and c both pose a serious threat to the health and well-being and people around the world, in the United States, and in Nevada. Based on our state's most recent data, rates of hepatitis B virus have stabilized and rates of hepatitis C virus have more than doubled. Now more than ever, it is necessary for our state to develop actionable goals and activities to guide viral hepatitis prevention efforts and improve treatment, care, and stigma for Nevadans living with viral hepatitis. The development of this elimination plan serves as our state's guide to reduce the burden of viral hepatitis in Nevada and to help our state meet the goals and objectives outline by the US Department of Health and Human Services for the elimination of viral hepatitis in the United States by 2030. It will take a coordinated and comprehensive effort from public health agencies, community organizations, healthcare providers, policymakers, and community members to help our state move closer to hepatitis elimination. However, our state is poised to take on this challenge and eliminate the threat of viral hepatitis in Nevada.

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For more information about viral hepatitis prevention and control in Nevada, please visit: https://nvose.org/programs/viral-hepatitis-surveillance-prevention/

APPENDICES

Appendix 1: Targets for Global Viral Hepatitis Elimination, World Health Organization (WHO).

HBV and HCV are important public health problems that have caused high mortality and morbidity rates around the world. In 2016, the World Health Organization (WHO) announced the Global Health Sector Strategy on Viral Hepatitis which provided guidance and framework for countries to control HBV and HCV. The strategy suggests preventing both new infections of HBV and HCV and mortality due to consequences of viral hepatitis such as cirrhosis and liver cancer. WHO provides targets on preventive interventions of viral hepatitis, including metrics to measure the efforts through a goal-oriented approach. Using 2015 as a baseline year, WHO targeted a 90% reduction in new chronic infections and a 65% reduction in mortality by 2030 (Table 4).

Table 4. World Health Organization (WHO) targets for viral hepatitis elimination – Current Standing in Nevada.

Target areas				Global Baseline 2015	Nevada	Global 2030 Target
Service coverage	Prevention	Three-dose hepatitis B vaccine for 13 months (coverage %)		82%		90%
		Prevention of perinatal transmission of HBV: 1 dose Hep B vaccination in the first day (coverage %)		38%	76.2%[a]	90%
		Blood and injection safety (coverage %)	Blood safety: donations screened with quality assurance	89%	No data	100%
			Injection safety: use of engineered devices	5%	No data	90%
		Harm reduction (sterile syringe/needle set distributed per person per year for people who injected drugs		20	No data	300
	Treatment	Diagnosis of HBV (coverage %)		<5%		
		Diagnosis of HCV (coverage %)		No data		90%
		Treatment of HBV (coverage %)		<1%		
		Treatment of HCV (coverage %)		No data		80% eligible treated

Impact leading to elimination	Incidence of chronic HBV infections Incidence of chronic HCV infections	6-10 million	4.2 per 100.000 [b] 140 per 100.000 [b]	90% reduction
	Mortality from both chronic HBV and HCV infections	1.46 million	4.1 per 100.000 [b]	65% reduction

[a] WHO (2016). Combating Hepatitis B and C to Reach Elimination by 2030. World Health Organization

[b] Nevada Hepatitis Epidemiological Profile: 2018. Nevada Division of Public and Behavioral Health.

Appendix 2: Targets for National Viral Hepatitis Eliminations, Department of Health and Human Services (DHHS)

Table 5. Viral hepatitis elimination targets for the United States [2].

Core indicators		Baseline	2030 Target
Incidence of hepatitis A infections (acute Hep A)	Estimated number of cases	6,700	2,500
Incidence of hepatitis B infections (acute Hep B)	Estimated number of cases	22,200	2,200
Incidence of hepatitis C infections (acute Hep C)	Estimated number of cases	44,700	4,400
Rate of hepatitis B "birth dose" vaccination	Percentage	67 (2015-16 baseline)	90
People with hepatitis B infection aware of their infection	Rate/ 100,000	32 (2013–16 baseline)	90
Rate of hepatitis B–related deaths	Rate/ 100,000	0.46	0.16
Proportion of people who have cleared hepatitis C infection	Percentage	43 (2013-16 baseline)	80
Rate of hepatitis C–related deaths	Rate/ 100,000	4.13	1.44
Hepatitis Plan Disparities Indicators			
Reduce acute hepatitis B infections among people who inject drugs	Reported rate/100,000	1,4	0,10
Increase proportion of people with hepatitis B infection aware of their infection among Asian and Pacific Islanders	Percentage	39 (2013-16 baseline)	90
11a. Reduce rate of hepatitis B–related	Reported rate/100,000	2.45	0.86

deaths among Asian and Pacific Islanders			
11b. Reduce rate of hepatitis B–related deaths among non-Hispanic Blacks	Rate/ 100,000	0.74	0.26
12a. Reduce acute hepatitis C infections among people who inject drugs	Reported rate/100,000	2.30	0.20
12b. Reduce acute hepatitis C infections among American Indian or Alaska Native (AI/AN)	Reported rate/100,000	2.90	0.29
13a. Reduce rate of hepatitis C–related deaths among American Indian or Alaska Native (AI/AN)	Rate/ 100,000	10.24	3.58
13b. Reduce rate of hepatitis C–related deaths among Non-Hispanic Blacks	Rate/ 100,000	7,03	2.46

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