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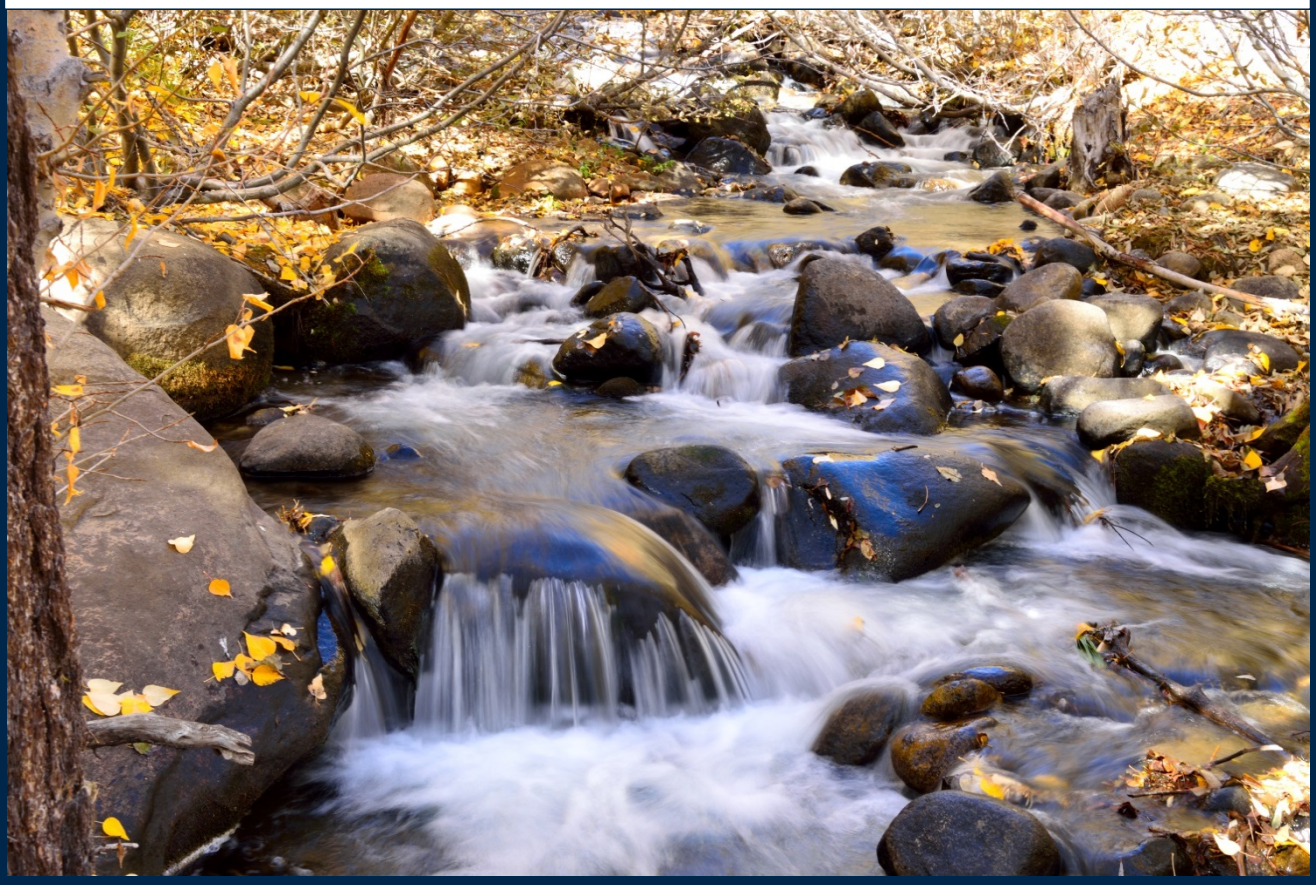

Compiled and Prepared By:

Washoe County Health District
1001 E. 9th Street, Building B, Reno
NV 89520-0027
Phone: (775) 328-2447Fax: (775) 328-3764
Email: epicenter@washoecounty.us
Web: http://www.washoecounty.us/health

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Cover picture by Cindy Hawks

2019
Annual Communicable Disease Summary

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Communicable diseases are a continuing threat to all people, regardless of age, gender, lifestyle, ethnic background or socioeconomic status. They cause illness, suffering and even death, and place an enormous financial burden on society. Indeed, Joshua Lederberg, Nobel laureate once commented "We live in evolutionary competition with microbes – bacteria and viruses. There is no guarantee that we will be the survivors." Although some communicable diseases have been controlled by modern advances, new ones are constantly emerging. The Washoe County Health District (WCHD) relies on healthcare providers, laboratories, and others to report the occurrence of notifiable diseases. Without such data, trends cannot be accurately monitored, unusual occurrences of diseases (such as Ebola Virus, Zika Virus, and outbreaks) might not be detected or appropriately investigated, and the effectiveness of control and prevention activities cannot be easily evaluated.

Under the direction of the District Health Officer, Mr. Kevin Dick and the Director of Epidemiology and Public Health Preparedness, Dr. Randall Todd, staff of the WCHD Communicable Disease Control Program coordinate the countywide disease surveillance and reporting system. They work in conjunction with the following prevention and control programs: tuberculosis (TB), foodborne illness, sexually transmitted disease (STD), HIV/AIDS, vaccine preventable diseases and vector-borne diseases.

Nevada Administrative Code Chapter 441A[1] identifies diseases of public health significance that must be reported to the WCHD. Persons required to report include health care providers and directors of hospitals, diagnostic laboratories, schools, child care facilities, correctional facilities, permitted food establishments and others. In general, each report is investigated to characterize the illness, collect demographic information about the case, identify possible sources of the infection and take steps necessary to minimize the risk of further disease transmission. Data are collected, maintained and analyzed at the program level. The 2017 Annual Communicable Disease Summary is a compilation of communicable disease surveillance data in Washoe County. It is recognized these data have the following limitations:

1.) For most diseases, reported cases represent a fraction of the true number. This is because many patients with mild disease do not seek medical care. Even if they do, the health care provider may not order a test to identify the causative agent.
2.) Health care providers may fail to report a case as required by law. For example, CDC estimates that there are as many as 1.2 million persons in the US who may be sick due to salmonellosis; however, only approximately 50,000 cases of salmonellosis are reported each year in the United States, which represents only 5% of the estimated level of illness.[2]
3.) Reported cases represent a skewed sample of the total. Severe illnesses are more likely to be reported than milder ones. Health care providers may be more likely to report contagious diseases such as TB than vector-borne diseases such as Lyme disease.
4.) Epidemics of disease or media coverage of a particular disease can greatly increase testing and reporting rates.

[1] NAC 441 A http://www.leg.state.nv.us/nac/NAC-441A.html
[2] http://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html

With these limitations in mind, surveillance data are valuable in a variety of ways. Analysis of disease incidence by various demographic variables is useful for identifying segments of the population that may be at higher risk of illness allowing public health officials to target prevention and control measures in ways that will have maximum impact. Further, analysis of surveillance data allows for identification of disease trends and may help to detect disease outbreaks or epidemics. However, for diseases that only occur sporadically, presentation of demographic information has limited value and may serve to compromise the privacy of individual case patients. Therefore, in this report, the amount of detail related to the population affected by any particular disease will vary depending on the number of reported cases.

It should be noted that in several places throughout this report, data have been included that are not current. These areas have been highlighted with a blue shading to make it clear that they do not represent current data. They are included so that the reader may gain a better understanding and perspective based on information that may be somewhat dated but still relevant.

The intent of this report is to provide local health care providers, infection control practitioners and other interested persons with useful data. Please contact the WCHD Division of Epidemiology and Public Health Preparedness (EPHP) at (775) 328-2447 for additional information or comments.

SUMMARY

Table A. Total Reported Cases of Selected Communicable Diseases by Year, Washoe County, 2014-2018.

	2014	2015	2016	2017	2018
AIDS	21	11	14	13	14
Campylobacteriosis	45	35	47	37	46
Chlamydia trachomatis, genital	1755	2033	2200	2504	2729
E. coli O157:H7	1	25	3	9	2
Giardiasis	12	14	20	10	20
Gonorrhea	492	547	598	743	918
Hemophilus influenzae type b	0	0	0	0	6
Hepatitis A	1	0	0	2	1
Hepatitis B (Acute)	2	4	2	5	2
Hepatitis B (Chronic)	52	62	73	65	62
Hepatitis C (Acute)	3	1	4	13	5
Hepatitis C (past or present)*	575	525	527	648	648
HIV infection	27	32	35	22	27
Listeriosis	0	0	0	0	0
Malaria	2	1	0	1	3
Measles	0	0	0	0	0
Meningococcal invasive disease	0	1	0	0	1
Mumps	4	2	3	2	2
Pertussis	56	13	2	11	13
Rotavirus	21	31	16	10	12
RSV	305	241	410	635	480
Rubella	0	0	0	0	0
Salmonellosis	35	53	30	28	36
Shigellosis	5	12	12	3	5
Syphilis (primary and secondary)	36	27	33	56	111
Tuberculosis	7	11	6	17	9
Typhoid Fever	0	0	0	1	0

Table B. Cases per 100,000 Population of Selected Communicable Diseases by Year Compared to Healthy People 2020 Target, Washoe County, 2013-2017.

Disease	2014	2015	2016	2017	2018	Healthy People 2020 Target
Met Healthy People 2020 Target in 2017						
Salmonellosis	8.0	12.0	6.9	6.2	6.2	6.8
E. coli 0157:H7	0.2	5.7	0.7	2.0	0.4	0.6
Listeriosis	0.0	0.0	0	0	0	0.2
Hepatitis A	0.2	0.0	0	0	0.2	0.3
Did Not Meet Healthy People 2020 Target in 2017						
Campylobacteriosis	10.3	7.9	10.5	8.2	10.0	8.5
Gonorrhea (Female, 15-44)	250.4	266.6	239.9	305.8	373.4	157.0
Gonorrhea (Male, 15-44)	250.4	293.6	361.3	390.6	479.6	198.0
Primary or Secondary Syphilis (Male)	14.3	10.1	12.6	18	38.6	6.8
Primary or Secondary Syphilis (Female)	2.3	2.3	2.2	7.1	9.6	1.4
Tuberculosis	1.6	2.5	1.3	3.8	2.0	1.0

ENTERIC DISEASES

I. Bacterial Enteric Diseases

A. Campylobacteriosis

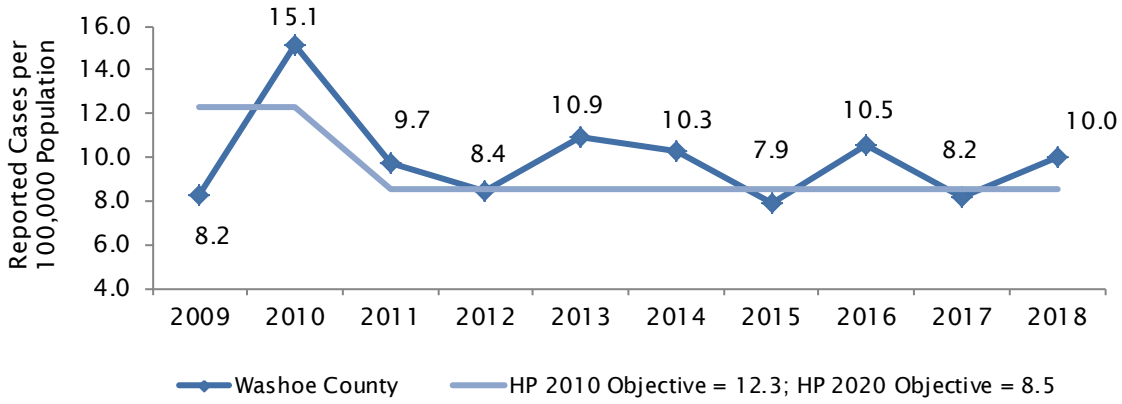
Campylobacter is the most common bacterial cause of diarrheal illness in the United States. Campylobacteriosis usually occurs in single, sporadic cases, but it can also occur in outbreaks. Campylobacteriosis is most commonly associated with handling raw poultry or eating raw or undercooked poultry.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the estimated national incidence of campylobacteriosis was 19.6 cases per 100,000 population. In 2018 the incidence rate was significantly higher for campylobacteriosis (12% increased) compared to the previous year. The Healthy People 2020 national health objective is 8.5 cases per 100,000 population.

Forty-six (46) cases of campylobacteriosis were reported in Washoe County in 2018 for a reported incidence of 10.0 cases per 100,000 population. Of the 46 cases, 40 (87%) were laboratory confirmed and 3 (6.5%) were probable cases epidemiologically linked to a confirmed case.

Figure 1.1 Rates of Reported Cases* of Campylobacteriosis, Washoe County, 2009 – 2018



*Effective in 2009, probable cases became reportable in Washoe County.

2. Population Affected

The median age of cases in Washoe County was 43.5 years (range: 2 year - 80 years); 20 (43%) of 46 reported cases were male. Eight (8) cases (17%) were hospitalized, with a median length of hospitalization of 2.5 days (range: 1 day - 29 days). One (1) case was a food handler. No deaths were reported.

Table 1.1 Reported Campylobacteriosis Cases by Race/Ethnicity, Washoe County, 2018

Race/Ethnicity	Number of Cases	Percent of Cases	# Cases per 100,000
White, non-Hispanic	34	73.9	11.6
Hispanic	4	8.7	3.4
Others* (A/PI, AI/AN, Black)	2	4.3	3.9
Unknown	6	13.0	N/A
Total Cases	46	100.0	

** A/PI = Asian/Pacific Islander AI/AN = American Indian/Alaskan Native*

Figure 1.2 Campylobacteriosis Cases by Age and Gender, Washoe County, 2018

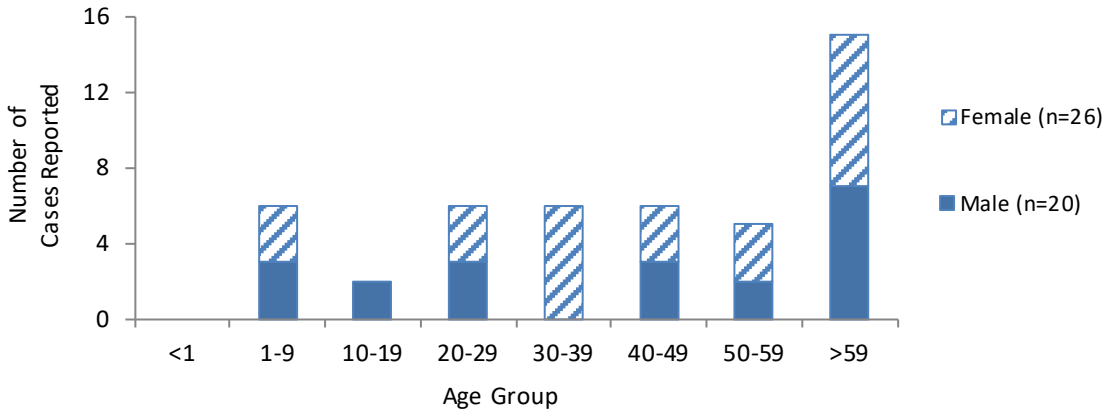


Table 1.2 Reported Risk Factors among Campylobacteriosis Cases, Washoe County, 2018(N=46)

Risk Factor (not mutually exclusive)	Number of Cases	%
Contaminated foods	18	49
Travel (7 international, 5 domestic)	12	32
Contact to a similarly ill person	7	19
Contact to animals*	9	24
Recreational water exposure	6	16
Day care associated**	1	3
Drank untreated water	3	8
Unknown risk factors (unable to interview or review medical record, exclusive)	2	5
No known risk factors*** (exclusive)	3	8

*Puppies, sick animal, birds, chicken, reptile
**Includes day care attendees, staff, or persons who live with a day care attendee.
*** No risk factors identified.

No campylobacteriosis outbreaks were reported or detected from surveillance systems in 2018.

B. *Escherichia coli* 0157:H7 (Shiga toxin- producing *E.coli* O157 = STEC O157)

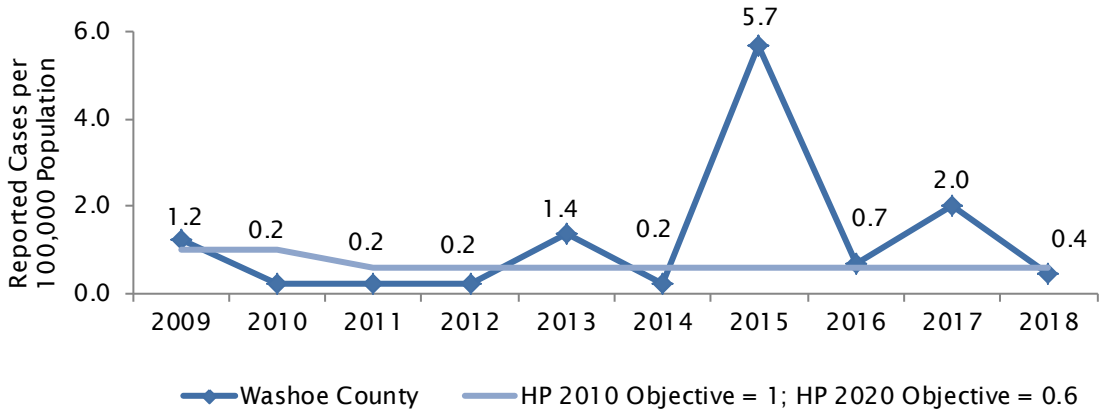
The new terminology for *Escherichia coli* species that cause human disease includes "Shiga toxin-producing Escherichia coli O157" (STEC O157) and "Shiga toxin-producing Escherichia coli non-O157" (STEC non-O157). Infection often leads to bloody diarrhea. Hemolytic uremic syndrome (HUS) is a serious, sometimes fatal complication often associated with STEC infection. Most illness has been associated with eating undercooked, contaminated ground meat. Other vehicles implicated in outbreaks are sprouts, lettuce, salami, unpasteurized milk and juice, and swimming in or drinking sewage-contaminated water. Person-to-person contact in families and child care centers is also an important mode of transmission.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the estimated national incidence of culture-based STEC infection was 5.9 cases per 100,000 population. The incidence of STEC infection was significantly higher for confirmed infection (26% increase). The Healthy People 2020 national health objective is 0.6 cases per 100,000 population. The national incidence of culture-based STEC non-O157 in 2015-2017 was 1.64 cases per 100,000 population and 0.95 for STEC O157 (latest available data). The incidence of STEC non-O157 and O157 SETEC in 2017 was unchanged.

Two (2) laboratory-confirmed cases of STEC O157 were reported in Washoe County in 2018 for a reported incidence of 0.4 cases per 100,000 population. Nine (9) cases of STEC non-O157 infection were reported for a reported incidence of 2.2 cases per 100,000 population, lower than the national incidence rate 2.66 in 2017 (latest available data). The total 2018 STEC incidence rate for Washoe County was 3.0 cases per 100,000 population. In 2015 Washoe County had the highest incidence rate in recent history due to a foodborne outbreak. Two (2) cases of HUS were reported in Washoe County in 2018. No deaths were reported. No cases were associated with a multi-state outbreak in 2018.

Figure 1.3 Rates of Reported Cases* of STEC O157 Infection, Washoe County, 2009–2018



*Effective in 2009, probable cases became reportable in Washoe County.

2. Population Affected

The median age of cases in Washoe County was 32 years (range: 3 year - 95 years); 8 (57%) of 14 reported cases were female. Twelve (12) of 14 cases (86%) with known race/ethnicity were White, non-Hispanic, one (1) (7%) was Hispanic and Asian or Pacific Islanders. Three (3) cases (21%) were hospitalized with a median length of hospitalization of 4 days. One of the cases was food handler. No deaths were reported.

Table 1.3 Reported Risk Factors Among STEC Cases, Washoe County, 2018 (N=14).

Risk Factor (not mutually exclusive)	Number of Cases	%
Contaminated foods	3	21
Travel (5/3 domestic/internationa travel)	8	57
Contact to a similarly ill person	5	36
Contact to animals*	3	21
Recreational water exposure	6	43
Day care associated**	0	0
Drank untreated water	1	7
Unknown risk factors (unable to interview or review medical record, exclusive)	2	14
No known risk factors*** (exclusive)	0	0
Total	14	100

C. Listeriosis

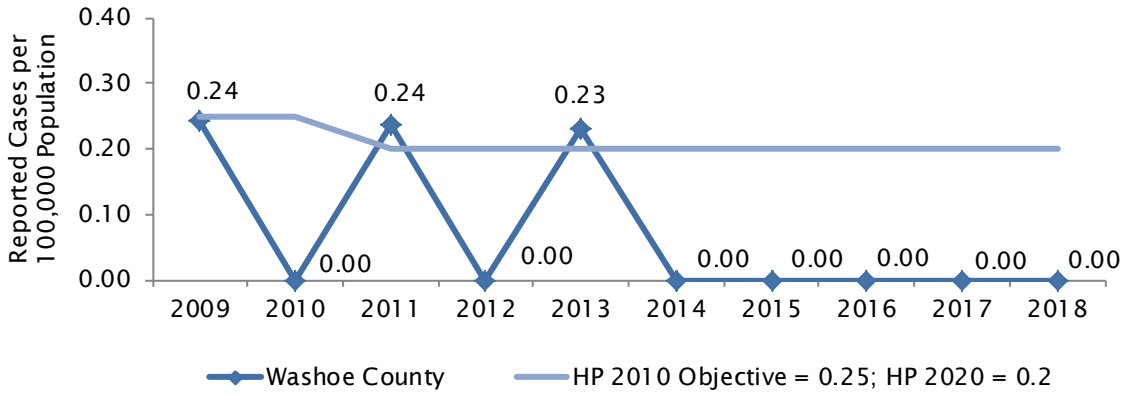
Listeriosis is a serious infection caused by eating food contaminated with the bacterium *Listeria monocytogenes.* In the United States, an estimated 1,600 persons become seriously ill with listeriosis each year. Approximately 16% of these infections are fatal.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the estimated national incidence of listeriosis was 0.3 cases per 100,000 population. This incidence shows a decrease by 4 % from the 2015-2017 data. The Healthy People 2020 national health objective is 0.2 cases per 100,000 population.

No (0) cases of listeriosis were reported in Washoe County in 2018.

Figure 1.4 Rates of Reported Cases of Listeriosis, Washoe County, 2009 – 2018



2. Population Affected

No cases of listeriosis were reported in Washoe County in 2018. The last case of listeriosis reported in Washoe County was reported in 2013.

D. Salmonellosis

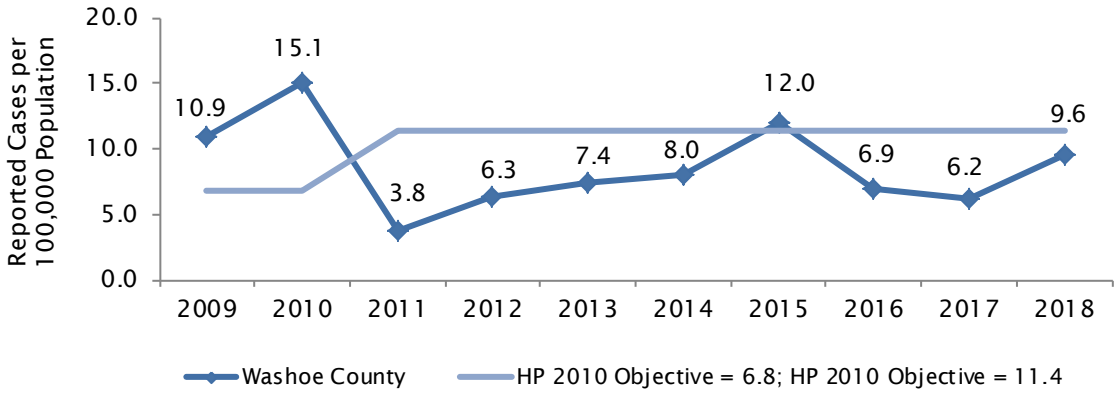
Salmonellosis is a bacterial infection that is transmitted among people and/or animals via the fecal-oral route. Although foods of animal origin are one source of *Salmonella,* transmission through fresh produce and direct contact have been increasingly recognized. Salmonellosis is one of the most frequently reported foodborne illnesses in the United States. About 1.2 million cases of Salmonellosis are reported with 23,000 hospitalizations, and 450 deaths in the United State every years.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2017, the national incidence of salmonellosis was 18.3 cases per 100,000 population. The overall rate shows a 9% increase from the 2015-2017 data. The Healthy People 2020 national health objective is 11.4 cases per 100,000 population.

Thirty-six (36) laboratory-confirmed cases and eight (8) probable case of salmonellosis were reported in Washoe County in 2018 for a reported incidence of 9.6 cases per 100,000 population.

Figure 1.5 Rates of Reported Cases* of Salmonellosis, Washoe County, 2009– 2018



* Effective in 2009, probable cases become reportable in Washoe County.

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2006-2017 states that of the 89% of *Salmonella* isolates serotyped in 2017 (latest available data), the top five (5) serotypes are Enteritidis (2.6 cases per 100,000 population), Newport (1.3 cases per 100,00 population), Typhimurium (1.4 cases per 100,000 population), Javiana (1.1 cases per 100,000 population), and I 4,[5],12:i:- (0.9 cases per 100,000 population).The incidence rate in 2017 compares with 2014-2016 was significantly lower for Typhimurium (decrease by 14%) and Heidelberg (decrease by 38%).

Thirty-three (33) *Salmonella* isolates reported in Washoe County in 2018 were serotyped either by the Nevada State Public Health Laboratory (NSPHL) or by the Centers for Disease Control and Prevention (CDC). Local data indicated the two serotypes, Enteritidis and Typhimurium accounted for 38.9% of salmonellosis in 2018.

Table 1.4 *Salmonella* Isolates by Serotype, Washoe County, 2018

Salmonella Isolate Serotype	Number of Cases	Percent of Cases
Bareilly	3	8.3
Dublin	1	2.8
Enteritidis	6	16.7
Heidelberg	1	2.8
Javiana	1	2.8
Mississippi	1	2.8
Montevideo	1	2.8
Newport	5	13.9
Panama	1	2.8
Paratyphi B	2	5.6
Poona	1	2.8
Saintpaul	1	2.8
Thompson	2	5.6
Typhimurium	8	22.2
Urbana	1	2.8
Unknown Serotype	1	2.8
Total	36	100.0

2. Population Affected

The elderly, infants, and those with impaired immune systems are more likely to have severe symptoms of salmonellosis. In 2018, the median age of cases in Washoe County was 36 years (range: 6 month - 78 years). Eighteen (18) cases (41%) were hospitalized with a median length of hospitalization of 3.5 days (range: 1 days - 10 days) and no deaths were reported. Five (5) cases were food handlers; no (0) cases were associated with child care facilities.

Table 1.5 Reported Salmonellosis Cases by Race and Ethnicity, Washoe County, 2018

Race/Ethnicity	Number of Cases	Percent of Cases	Cases per 100,000 Population
White/non-Hispanic	30	68	10.3
Hispanic	10	23	8.6
Black	1	2	8.6
Asian/Pacific Islander	2	5	6.2
Native	0	0	0.0
Unknown	1	2	N/A
Total cases	44	100	9.6

Figure 1.6 Salmonellosis Cases by Age and Gender, Washoe County, 2018

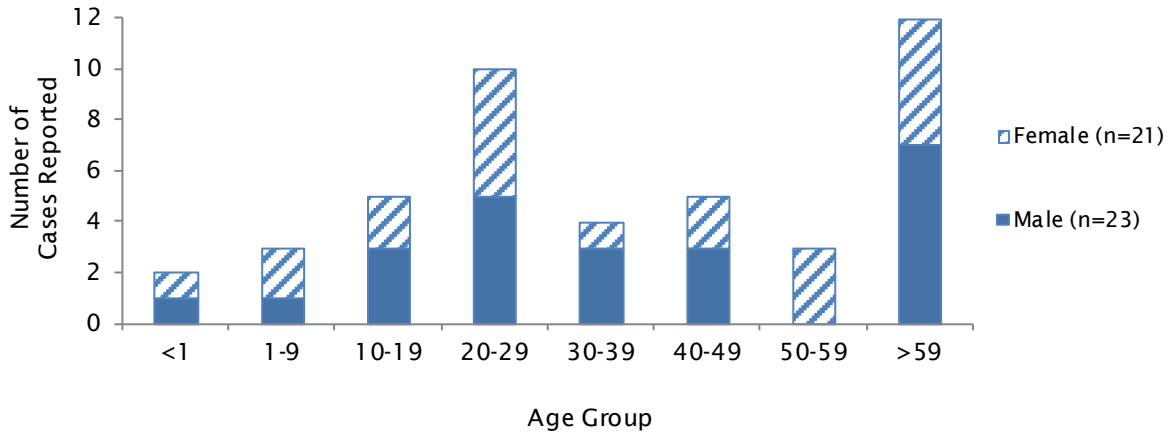


Table 1.6 Reported Risk Factors Among Salmonellosis Cases, Washoe County, 2018

Risk Factors (not mutually exclusive)	Number of Cases	%
Contaminated foods	19	43
Contact with symptomatic person	13	30
Travel (5/10 domestic/international travel)	15	34
(reptile/bird/puppy)	10	23
Recreational water exposure	8	18
Day care associated*	0	0
Drank untreated water	0	0
Unknown or missing data (Exclusive)	0	0
No known risk factors identified (exclusive)	12	27

Three clusters of Salmonellosis were investigated in 2018. One of the cases was associated with multi-state outbreaks related to kratom products.

E. Shigellosis

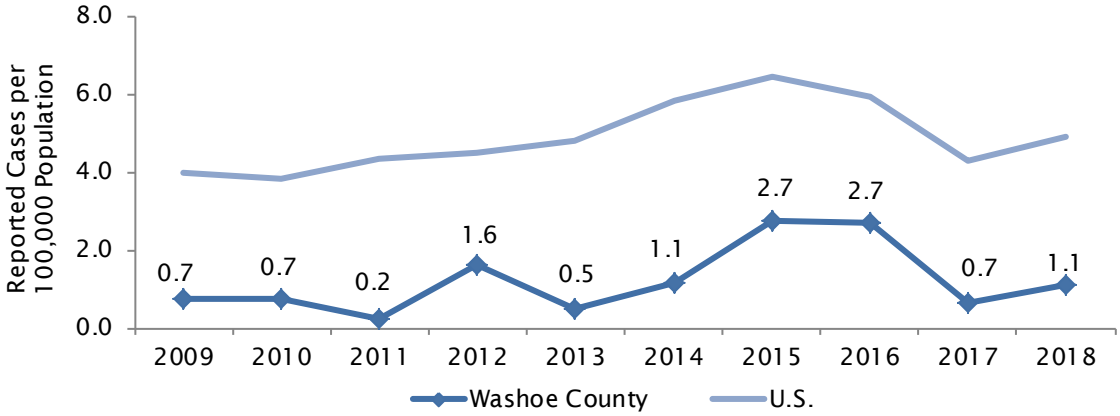
Shigellosis is a bacterial infection that is transmitted from person-to-person through the fecal/oral route. Approximately 18,000 cases of shigellosis are reported in the United States every year. Children, especially toddlers ages 2 to 4 years, are the most likely to get shigellosis. Many cases are related to the spread of illness in child care settings or in families with small children.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the national incidence of confirmed or CIDT positive only shigellosis was 4.9 cases per 100,000 population. A Healthy People 2020 national health objective has not been established for shigellosis.

Four (4) laboratory-confirmed and one (1) probable cases of shigellosis were reported in Washoe County in 2018 for an incidence of 1.1 cases per 100,000 population.

Figure 1.7 Rates of Reported Cases of Shigellosis, 2009 – 2018



2. Population Affected

Five (5) cases of shigellosis were reported in 2018. The median age of cases was 52 years (range: 18 – 57 years). Two (2) cases were White non-Hispanic, three (3) were female. Three hospitalized with a median length of hospitalization of 4 days (range: 3 days - 4 days) and no deaths associated with Shigellosis were reported. One person had exposure to recreational water.

No cases were associated with a multi-state outbreak.

Figure 1.8 Shigellosis Cases by Age and Gender, Washoe County, 2018

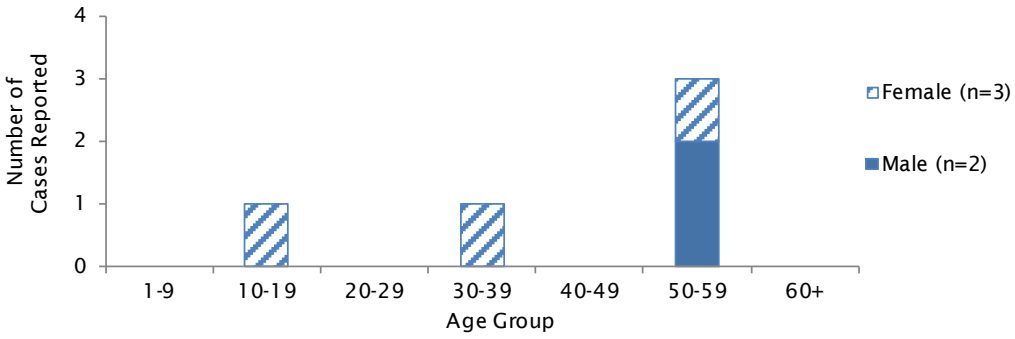
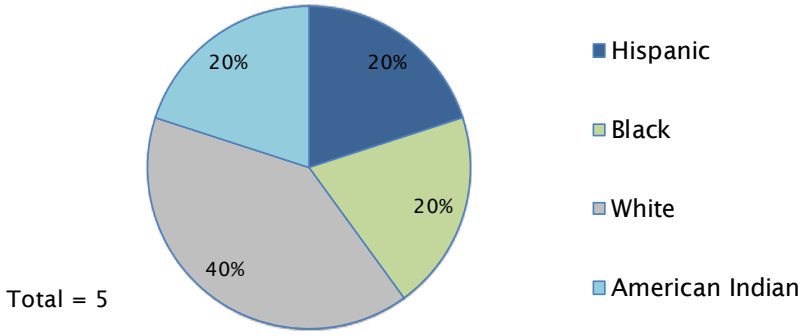


Figure 1.9 Shigellosis Cases by Race Ethnicity, Washoe County, 2018



F. Typhoid Fever

Typhoid fever is caused by *Salmonella typhi* and is transmitted from person-to-person through the fecal/oral route. Two typhoid vaccines are currently available and are recommended for travelers to endemic countries.

1. Reported Incidence

The national incidence of reported typhoid fever cases in 2017 was 0.13 cases per 100,000 population. A Healthy People 2020 national health objective for typhoid fever has not been established.

No cases of typhoid fever were reported in Washoe County in 2018.

G. *Vibrio* Species

Vibrio cholerae consists of more than 200 serogroups. Of these, only serogroups O1 and O139 are associated with the clinical syndrome of cholera and can cause large epidemics. Serogroups O1 and O139 result in an acute bacterial enteric disease characterized in its severe form by sudden onset, profuse painless watery stools, nausea and profuse vomiting early in the course of illness. In most cases infection is asymptomatic or causes mild diarrhea. Asymptomatic carriers can transmit the infection. Cholera is acquired through ingestion of an infective dose of contaminated food or water and through fecal-oral transmission.

Vibrio vulnificus and *Vibrio parahaemolyticus* are in the same family of bacteria as those that cause cholera. Both bacteria can cause disease in persons who eat contaminated seafood or have an open wound exposed to seawater. There is no evidence of person-to-person transmission. Both *V. vulnificus* and *V. parahaemolyticus* can cause serious illness and death in persons with pre-existing liver disease or compromised immune systems. *V. vulnificus* and *V. parahaemolyticus* infections are

rare, but also underreported. Vibriosis became a reportable condition in the State of Nevada effective in 2011.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the estimated national combined incidence of *Vibrio* species infection was 1.1 cases per 100,000 persons, which was significantly higher compare to the previous year. The overall rate shows a 109% increase from the 2015-2017 data The new Healthy People 2020 national health objective for infection with *Vibrio* species is 0.2 cases per 100,000 population.

There were two (2) cases of reported vibriosis in Washoe County in 2018 for an incidence of 0.43 cases per 100,000 population.

2. Population Affected

Two (2) cases of vibriosis were reported in 2018. The median age of cases was 43 years (range: 16 – 70 years). One case was hospitalized and died in the hospital. This case had multiple underlying medical conditions. The case had exposure to raw seafood.

H. Yersiniosis

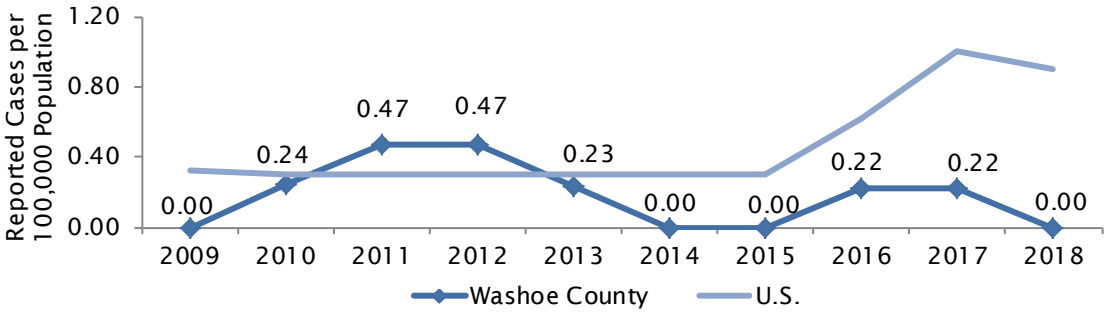
Yersiniosis is a relatively infrequent gastrointestinal disease. Symptoms of diarrhea and abdominal pain are caused by infection with Y*ersinia enterocolitica.*

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2015-2018 describes surveillance data for 2018 and compares them with 2015-2017 data. In 2018, the estimated national incidence of confirmed or CIDT positive yersiniosis was 0.9 cases per 100,000 population. Compare with incidence during 2015-2017, the 2018 incidence rate increase significantly for yersiniosis (58% increase). The Healthy People 2020 national health objective for yersiniosis is 0.3 cases per 100,000 population.

No cases of yersiniosis were reported in Washoe County in 2018.

Figure 1.9 Rates of Reported Cases of Yersiniosis, 2009 – 2018.



2. Population Affected

No cases of Yersiniosis were reported in Washoe County in 2018.

II. Parasitic Enteric Diseases

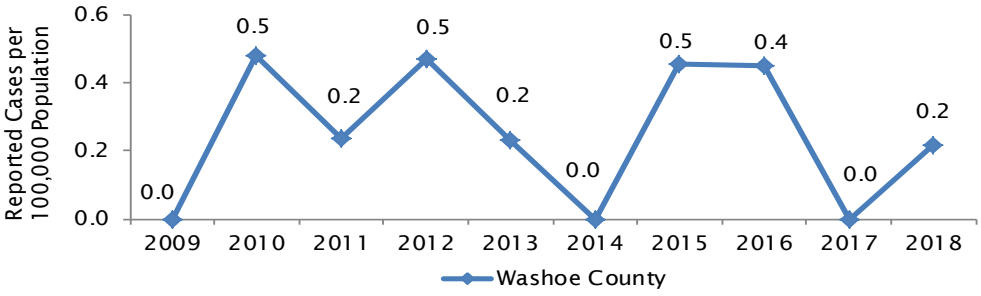
A. Amebiasis (*Entamoeba histolytica*)

Amebiasis is a diarrheal illness caused by a one-celled parasite, *Entamoeba histolytica.* Amebiasis is most common in people who live in developing countries with poor sanitary conditions. In the United States, amebiasis is most often found in immigrants from developing countries. It is also found in people who have traveled to developing countries and in people who live in institutions that have poor sanitary conditions. Men who have sex with men (MSM) have an increased risk of amebiasis. Amebiasis is not a notifiable disease in the U.S.; therefore, national case data are not available.

1. Reported Incidence

One (1) case of Amebiasis was reported in Washoe County in 2018 for incidence of an 0.2 cases per 100,000 population.

Figure 2.1 Rates of Reported Cases of Amebiasis, Washoe County, 2009– 2018



2. Population Affected

One (1) case of Amebiasis was reported in Washoe County in 2018. The case was a Black female in the 10-19 year age group. The case was not hospitalized. The case most likely acquired the infections while living in Africa refugee camp. No death was reported.

B. Cryptosporidiosis

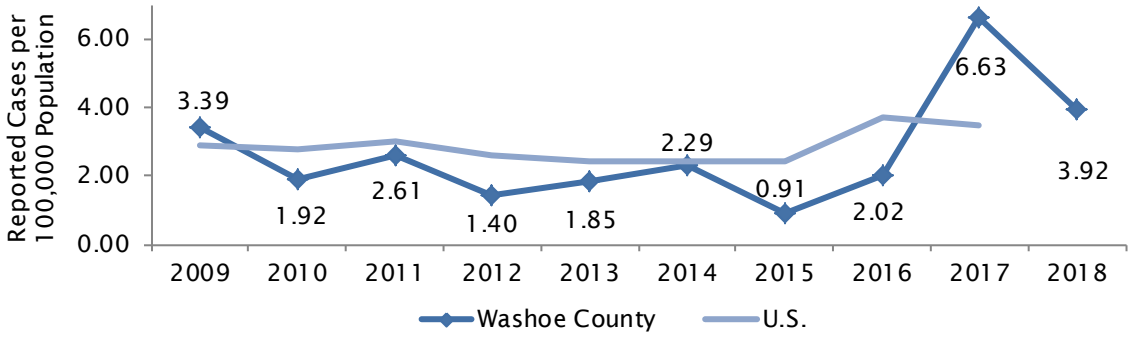
Cryptosporidiosis is a diarrheal disease transmitted via the fecal/oral route and is caused by the parasite, *Cryptosporidium parvum*. It is found in the intestines of humans and animals and is passed in the stool into the environment. The parasite is protected by an outer shell, survives outside the body for long periods of time, and is very resistant to chlorine disinfection. During the past two decades, *Cryptosporidium* has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. *Cryptosporidium* is found in every region of the United States and throughout the world. Men who have sex with men (MSM) have an increased risk of cryptosporidiosis.

1. Reported Incidence

Preliminary Incidence and Trends of Infection with Pathogens Transmitted Commonly Through Food - Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2006-2017 describes surveillance data for 2017 and compares them with 2014-2016 data. In 2017 (the most recent data), the national incidence of confirmed cryptosporidiosis was 3.7 cases per 100,000 population. A Healthy People 2020 national health objective has not been established for cryptosporidiosis.

One (1) laboratory-confirmed and seventeen (17) probable cases of cryptosporidiosis were reported in Washoe County in 2018, for an incidence of 3.92 cases per 100,000 population, a significant decrease compared to 2017. It is important to note that there has been a more widespread use of diagnostic testing such as rapid screening due to the recent licensing of nitazoxanide for the treatment of cryptosporidiosis. Nitazoxanide was licensed by the Food and Drug Administration (FDA) in November 2002 for the treatment of cryptosporidiosis in children aged 1-11 years. In June 2004, nitazoxanide was also licensed for older children and adults.

Figure 2.2 Rates of Reported Cases of Cryptosporidiosis, 2009 – 2018



2. Population Affected

The median age of cases was 48 years (range: 15 years – 79 years). There were 11 (61%) female. Fourteen (14) cases were White, non-Hispanic, three (3) Hispanic and one (1) was unknown race. None of the cases were in food handlers. Two (2) of the cases were hospitalized for an average of 3.5 days (range between 1 and 7 days) and no deaths were reported.

Figure 2.3 Cryptosporidiosis Cases by Age and Gender, Washoe County, 2018

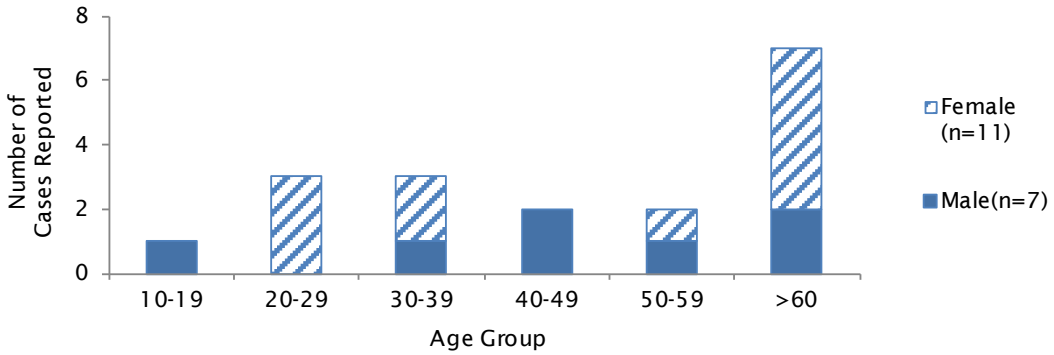


Table 2.1 Reported Risk Factors Among Cryptosporidiosis Cases, Washoe County, 2018

Risk Factor (not mutually exclusive)	Number of Cases	%
Travel (3 international and 1 domestic)	6	33
Recreational water exposure	5	28
Daycare associated	0	0
Contact with ill animals	1	6
Underlying chronic conditions	1	6
Unable to interview (exlusive)	1	6
No known risk factors identified (exclusive)	8	44

No cryptosporidiosis outbreaks were reported in 2018.

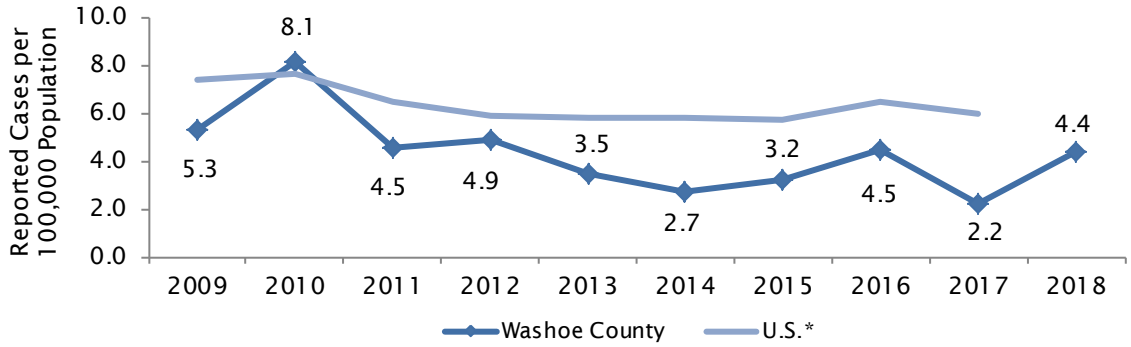
C. Giardiasis

Giardiasis is a diarrheal illness transmitted via the fecal/oral route and caused by a one-celled parasite, *Giardia lamblia. Giardia* lives in the intestines of people and animals. The parasite is passed in the stool of an infected person or animal. It is protected by an outer shell that allows it to survive outside the body and in the environment for long periods of time. *Giardia* is found in every region of the United States and throughout the world. During the past two decades, *Giardia* has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. It is also easily transmitted from person-to-person and is a common cause of diarrhea in child care settings.

1. Reported Incidence

In 2017, the national reported incidence of giardiasis was 5.94 cases per 100,000 population, which was the most current national data. In 2018, 20 cases of giardiasis were reported in Washoe County for an incidence rate of 4.4 cases per 100,000 population. All 20 cases were laboratory confirmed.

Figure 2.4 Rates of Reported Cases* of Giardiasis, 2009 – 2018



*Giardiasis was not nationally notifiable until 2002. Effective in 2009, probable cases became reportable in Washoe County.

2. Population Affected

The median age of cases in Washoe County was 42.5 years (range: 4 years – 74 years). Seven (7) cases (35%) were female. Sixteen (16) cases were White non-Hispanic, one (1) Black and three (3) Hispanic. Two cases were hospitalized with a median length of hospitalization of 6 days (range: 4 days - 8 days). No deaths were reported.

Figure 2.5 Giardiasis Cases by Age and Gender, Washoe County, 2018

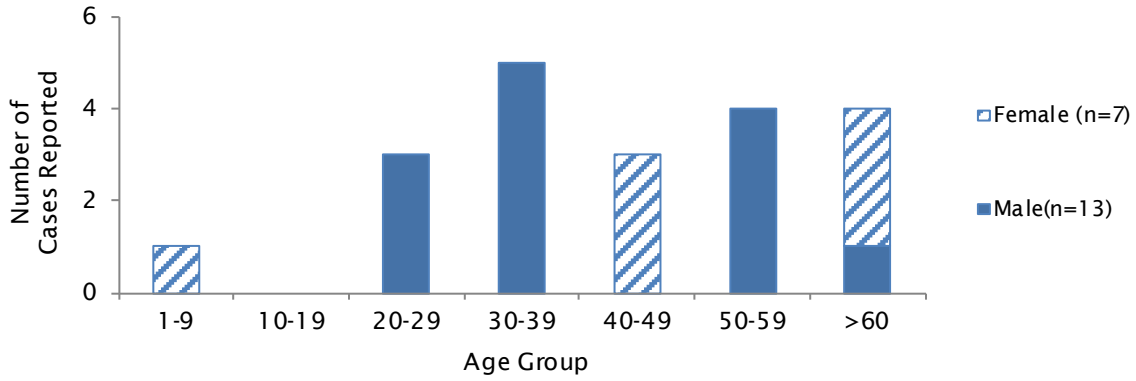


Table 2.2 Giardiasis Cases by Race and Ethnicity, Washoe County, 2018

Race/Ethnicity	Number of Cases	Percent of Cases	Cases per 100,000 Population
White/non-Hispanic	16	80	5.5
Hispanic	3	15	2.6
American Indian/Alaska Native	0	0	0.0
Black	1	5	8.6
Asian	0	0	0.0
Total cases	20	100	4.4

Table 2.3 Reported Risk Factors Among Giardiasis Cases, Washoe County, 2018

Risk Factor (not mutually exclusive)	Number of Cases	%
Domestic / International Travel (2/4)	6	30
Recreational water exposure	7	35
Drank untreated water	1	5
Animal contact*	4	20
Contact with symptomatic confirmed case	1	5
Day care associated**	1	5
No acknowledged risk (exclusive)	3	15
Unknown risks (unable to interview, exclusive)	2	10

* High risk animal contact such as sick animal, sick puppies, etc.

** Includes day care attendees, staff, or persons who live with a day care attendee.

No outbreak of giardiasis was reported in 2018.

III. Viral Enteric Diseases

A. Norovirus

Norovirus" is the official genus name for the group of viruses previously called "Norwalk-like viruses" (NoV), a member of the viral family *Caliciviridae*. Norovirus infection causes gastrointestinal illness characterized by nausea, abdominal cramps, profuse diarrhea and projectile vomiting.

Noroviruses are human pathogens transmitted primarily through the fecal/oral route, by consumption of fecally contaminated food or water, or by direct person-to-person spread. Airborne and fomite transmission are also likely. Aerosolization of vomitus presumably results in droplets contaminating surfaces or entering the oral/nasal mucosa and being swallowed.

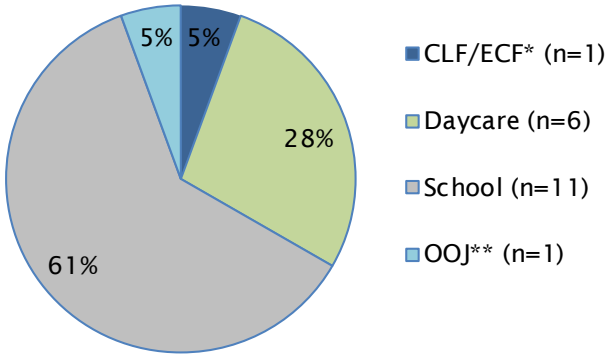
During January 1, 2017 through December 31, 2017, public health departments reported 839 foodborne disease outbreaks to the Centers for Disease Control and Prevention (CDC). Norovirus was the most reported etiological agent accounting for 38% of confirmed cases. The CDC annual outbreak reports for 2018 were not available as of the date this report was prepared.

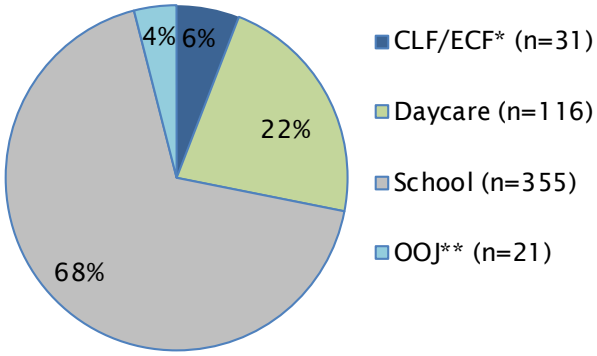
Most foodborne outbreaks of NoV illness are the result of direct contamination of food by a food handler immediately before its consumption. By contrast, NoV outbreaks in group living facilities are usually due to person-to-person, fomite and aerosol transmission. A public vomiting incident (PVI) carries high risk for transmission to other nearby persons. Contaminated raw oysters, fruits, vegetables and water have also caused outbreaks

Cases of NoV are not reportable in Nevada unless they are part of an outbreak. In 2018, NoV was confirmed as the cause of one (1) outbreak and suspected as the cause of seventeen (17) other outbreaks in Washoe County. Rotavirus was later suspected as the etiology in one (1) of the outbreaks at a childcare center. Of the eighteen (18) total viral gastroenteritis outbreaks reported in Washoe County, 61% (11/18) occurred in a school

setting 33% (6/18) occurred in a childcare setting and there was one (1) outbreak (<1% - 1/18) at an adult assisted living facility. The median number of reported ill persons per outbreak was 21 (range: 6 - 186 reported ill persons per outbreak). A total of 533 persons were reported as ill of which 530 met the case definition. Less than 1% (1/533) was confirmed by laboratory testing. Of the 533 reported ill persons, 67% (358/533) were associated with a school setting, 27% (144/533) were associated with a childcare setting and 6% (31/533) were associated with an adult assisted living facility. The transmission modes were primarily person-to-person.

Figure 3.1 Reported Norovirus Outbreaks by Facility type, Washoe County, 2018





*CLF/ECF – Group Living Facility
(A) – Number of Outbreaks (n=23)

**OOJ - Out off Jurisdiction
(B) – Number of Ill Persons (n=1155)

IV. Surveillance, Prevention and Control of Enteric Diseases

A. Investigation of Consumer Complaints

In 2018, the Division of Environmental Health Services (EHS) Food Safety Program received 115 complaints involving 134 individuals reporting a foodborne illness. Foodborne illnesses comprise the various acute syndromes that result from the ingestion of foods contaminated by infection-producing bacteria, parasites and viruses. The Food Safety Program is responsible for surveillance and investigation of foodborne illness complaints in Washoe County. The purpose of these investigations is to identify and halt potential epidemics of foodborne illness.

The number of complaints averaged ten (10) per month and ranged from four (4) in December to sixteen (16) in October. In 2014 through 2018, the number of complaints received per month averaged 11, 10, 13, 8 and 10 respectively. All foodborne illness or food product complaints that involved a product regulated by the Food and Drug Administration (FDA) or the United States Department of Agriculture (USDA) were forwarded to the respective agency.

Figure 4.1 Foodborne Illness Complaints Received by Month, WCHD, 2014 – 2018

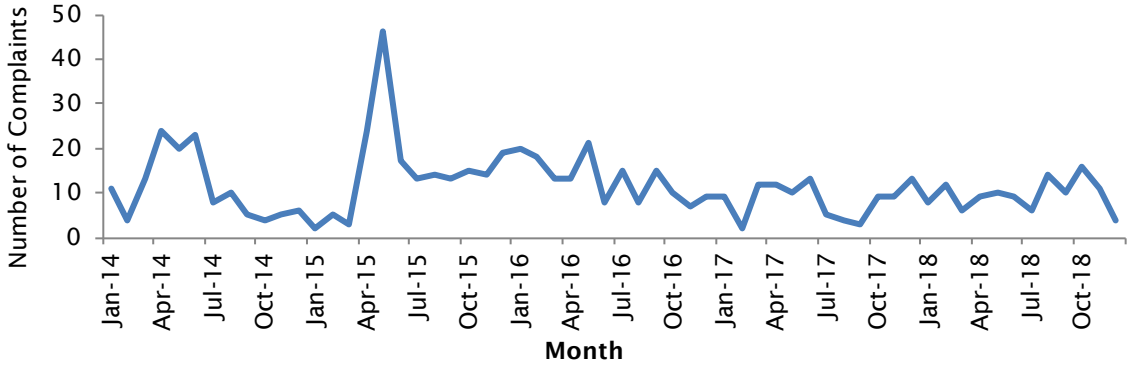
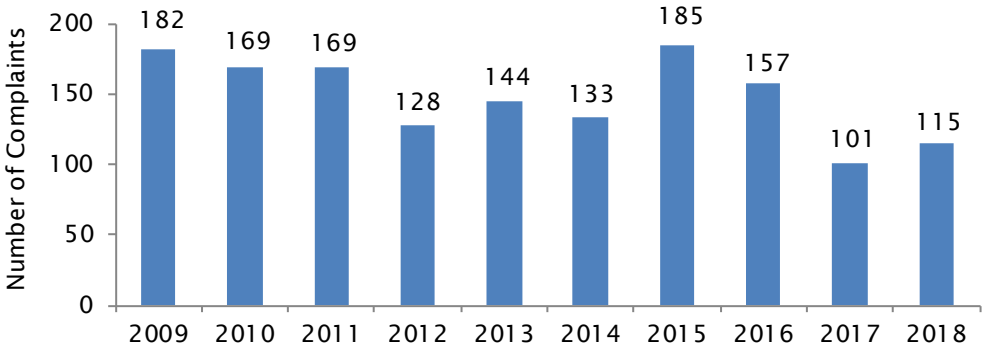


Figure 4.2 Foodborne Illness Complaints, WCHD, 2009– 2018



B. Exclusion of Ill Food Handlers

Six (6) food service workers were excluded from work in 2018 to prevent transmission of confirmed or suspected diseases through handling food or person-to person contact. All individuals were allowed to return to work after the Washoe County Health District (WCHD) determined they were no longer contagious.

C. Consumer Alerts and Recalls

The Food Safety Program also monitored consumer alert and recall notices on the internet. Most of the recalls and alerts did not affect Washoe County residents, as most products were not shipped into the area. If a product was distributed into Washoe County, staff ensured that distributors and/or retail outlets were notified and complied with the recommendations. There were two (2) recalls that were investigated as part of nationwide outbreaks. The total number of consumer alerts/recalls tracked by the food safety program in 2018 was 15.

D. Outbreaks

In addition to the eighteen (18) viral gastroenteritis outbreaks there were sixteen (16) outbreaks of Hand, Foot and Mouth Disease (HFMD) outbreaks in local childcare settings in Washoe County in 2018. Other outbreaks associated with school and childcare settings included Influenza-Like Illness (12), Pink Eye (2) and Respiratory Syncytial Virus (1). There were eleven (11) investigations of permitted food establishments related to consumer illness complaints but no outbreaks were

associated with any of these facilities. Additionally there were investigations of outbreaks stemming from a local corporate picnic and national outbreaks related to recalled supplements and ground beef.

1. Nationwide Outbreak of Salmonella linked to Kratom

On April 2nd, 2018 the FDA issued mandatory recall of a list of kratom supplement products following a multistate outbreak investigation of *Salmonella* strains linked to these products by the Centers for Disease Control and Prevention (CDC). On April 18th, 2018 Environmental Health Services (EHS) received a referral from the Communicable Disease (CD) program for a case of *Salmonella* thompson that matched the national outbreak. The case had consumed kratom powder believed to be part of the recall and purchased from a local smoke shop. Upon investigation it was noted that there were at least two (2) other smoke shops and stores believed to have recalled kratom products. Staff from EHS did investigations at all facilities known to have kratom, five (5) in total, and put a hold order on one hundred and forty-six (146) bags of kratom powder and capsules. On April 25th, 2019 there were 2 samples taken by EHS staff from the smoke shop of the product that the case consumed. The samples were submitted to the Nevada State Public Health Lab (NSPHL) for testing. On May 2nd, 2019 sample reports indicated the product was negative for salmonella. The FDA advised EHS to have all recall-listed kratom to be destroyed and return the remaining product on hold back to the merchant to allow for sale. On May 24th, 2019 the outbreak was declared over by the CDC and the EHS case was closed. There were no further cases of salmonella in Washoe County matching the recall reported in 2018.

2. Outbreak of Clostridium perfringens following a Company Picnic

On June 21st 2018, notification was received by EHS from the CD program of a suspected foodborne illness outbreak at a corporate facility (Facility A) following their annual company picnic. The picnic had occurred a day prior, June 20th, 2019 and was attended by approximately three hundred (300) employees. The initial report indicated there were approximately thirty (30) illnesses with predominant symptoms of diarrhea and abdominal cramping. A manager of Facility A, whom called in the report, stated that the food at the picnic came from a local restaurant (Restaurant A) and was supplemented with beans and rice prepared at home by two (2) employees. The company also held a home-made salsa competition at the picnic with an unknown number of employees participating. Staff from EHS interviewed twenty (20) ill employees and delivered ten (10) stool specimen collection kits to ill individuals willing to submit a sample. The kits were collected and delivered to the NSPHL for analysis on June 22nd, 2019.

Staff from EHS responded to Restaurant A on June 21, 2019 to investigate potential food sources. Upon interview of the owner it was stated that ten (10) trays of carne asada (beef), ten (10) trays of grilled chicken, five (5) trays of diced potatoes, four (4) trays of pico de gallo, four (4) trays of pickled carrots and onions, and one (1) five-gallon bucket each of red sauce and green sauce and tortilla chips were provided for the picnic. There was no food left over from the picnic preparation to obtain samples. During the investigation of Restaurant A EHS staff did not note any violations of temperatures or procedures during food preparation. Staff from EHS also interviewed the employees of Facility A, who prepared the beans and rice for the picnic. It was noted that both food items were precooked and cooled the day

before and then reheated the day of the event. There were no records of temperature monitoring for the beans or rice and there was no food leftover to sample.

On June 24th, 2019 the NSPHL reported four (4) of the specimens submitted from Facility A employees were positive for Clostridium perfringens. The results matched the symptoms and duration of illnesses reported. Follow-up questionnaires issued to employees by CD staff indicated that there were one-hundred and twenty-one (121) employees attending the picnic who met case definition, with onset of symptoms between June 20th and June 23rd, 2019. It was further determined by EHS that the likely source was the beans that were prepared by an employee of Facility A. A final report was completed by CD and EHS on August 2nd, 2019 and provided to management of Facility A with findings and recommendations.

3. Nationwide Outbreak of Salmonella Newport linked to Ground Beef

On September 12th, 2018 a notice was sent by the CDC Outbreak Response and Prevention Branch of one hundred and fifty-two (152) cases of Salmonella Newport related to ground beef consumption. The cases showed 3 specific patterns on pulsed-field gel electrophoresis (PFGE). On September 13th, 2018 it was reported that one (1) of the cases resided in Washoe County. The case was a 4 year-old male with onset of symptoms on September 4th, 2018. On September 20th, 2018 a parent of the case reported to CD staff that they get their ground beef from a large retail Store (Store A). Staff from EHS contacted Store A with the parent's shopper card information requesting purchase records for 3-months prior to the onset of illness. Staff from EHS followed up with Store A over the next week with no response and on September 27th, 2018 a letter was hand-delivered to Store A requiring cooperation to provide requested information for the outbreak to the Health Authority under Nevada Administrative Code (NAC) 441A.280. On October 2nd, 2018, EHS received reports from CD of 2 other cases of Salmonella Newport from Washoe County matching the nationwide outbreak. One of the newly reported cases also shopped at Store A and provided a shopper's card information. The letter was forwarded by EHS to the corporate office of Store A requesting 3-month purchase records for both cases. Information was then provided from Store A of purchases for both cases and it did not indicate any purchases of ground beef.

On October 4th, 2018, a recall of 6.5 million pounds of raw beef products from a processing and packaging establishment (Establishment A) in Tolleson, Arizona was issued by the United States Department of Agriculture Food Safety and Inspection Service (USDA-FSIS) as a result of trace-back linking the products to the nationwide outbreak. Recalled products were packaged from July 26th, 2018 through September 7th, 2018. A list of retailers was provided and in response staff from EHS contacted all fourteen (14) local retailers on the list to ensure the product was no longer on the shelves.
Additionally a post was put on the EHS social media site regarding the recall so that local residents could check their freezers.

On November 13th, 2018 EHS received a report from CD of a fourth case from Washoe County that matched the nationwide outbreak. The patient was a 70 year-old female who had an onset of October 25th, 2018. She had reported eating ground beef that was purchased in July of 2018 from a local retail store (Store B). Of note, Store B was on the list of retailers from the recall. Staff from EHS requested

shopping records from Store B for the case from June 1st, 2018 through October 31st 2018. The case also stated there was ground beef from the purchase remaining in her freezer. The remaining ground beef, approximately 2 pounds, was picked up by EHS from the case's home freezer on November 14th, 2018 and delivered to the NSPHL for analysis. On November 20th, 2018 NSPHL reported a positive result for Salmonella and matched the serotype to the nationwide outbreak using whole genome sequencing (WGS). Information provided from shopping records for the case from Store B confirmed purchase of twelve (12) pounds of ground beef on July 8th, 2018. A subsequent expansion of the recall in late October confirmed that the product was subject to recall and was distributed to Store B from Establishment A. As of December 31st, 2018 no new cases linked to the outbreak were reported in Washoe County.

HEPATITIS

"Hepatitis" is a general term for inflammatory conditions of the liver. It is characterized by jaundice, hepatomegaly, anorexia, abdominal and gastric discomfort, abnormal liver function, clay-colored stools and dark urine. It may be mild and brief, or severe, fulminate and life threatening. Hepatitis may be caused by: bacterial or viral infection, parasitic infestation, alcohol and/or drug abuse, chemical or biological toxins or transfusion of incompatible blood. This report will focus only on viral forms of hepatitis.

I. Hepatitis A Virus (HAV) Infection

A. Surveillance Case Definition (2012 CDC case definition)

Clinical Description
An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either jaundice, or elevated serum alanine aminotransferase (ALT) or aspartate aminotransferase (AST) levels.

Laboratory Criteria for Diagnosis
Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive

Case Classification

Confirmed

- A case that meets the clinical case definition and is laboratory confirmed, OR
- A case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

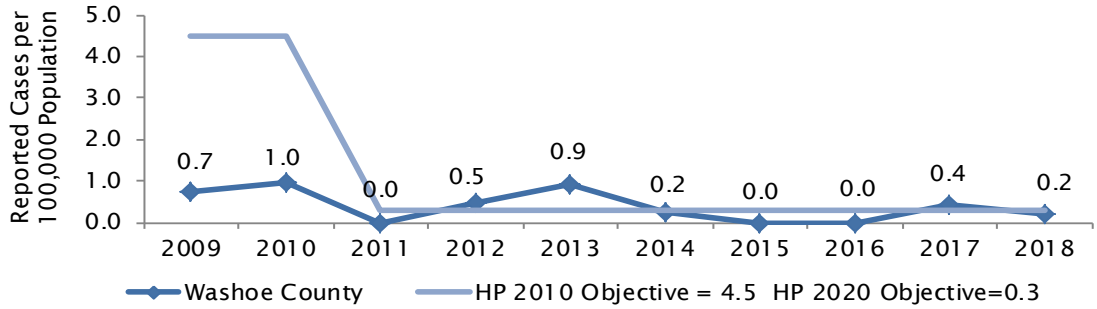
B. Epidemiology

HAV is transmitted from person-to-person via the fecal/oral route. Historically, children have had the highest rates of HAV infection. They are often asymptomatic, and are a primary source of acute infection to household members and contacts in child care facilities. As of July 1, 2002, Nevada Administrative Code Chapters 392.105 and 394.190 requires all children entering a Nevada school (public or private) for the first time to be immunized against HAV. HAV can produce jaundice or a flu-like syndrome in adults. There is no chronic form of HAV but there is a relapsing form with a prolonged course (that can last for up to 6 months).

1. Reported Incidence

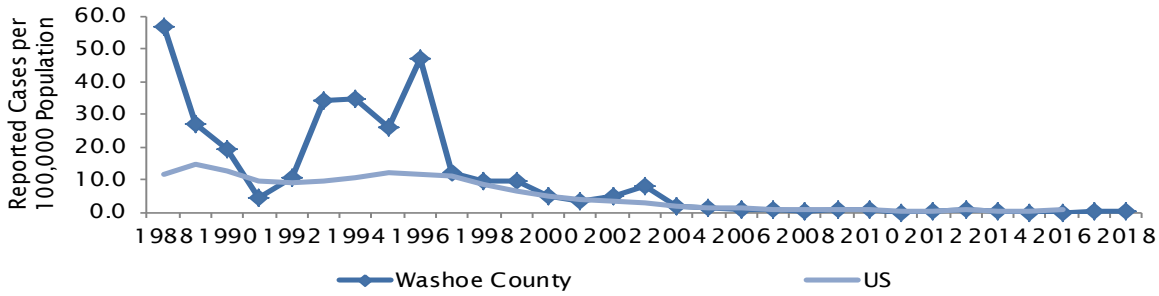
One (1) laboratory-confirmed case of acute hepatitis A was reported in 2018 for an incidence rate of 0.2 cases per 100,000 population. The Healthy People 2020 national health objective for acute HAV is 0.3 cases per 100,000 population. In 2017, the national incidence rate of acute hepatitis A was 1.03 cases per 100,000 population, which was the most current national data.

Figure 1.1 Rates of Reported Acute Hepatitis A Cases, Washoe County, 2009-2018



HAV infection follows a cyclic pattern. In the United States, nationwide increases in incidence were historically seen every 10-15 years. Washoe County has observed peaks in 1988 and 1996.

Figure 1.2 Rates of Reported Acute Hepatitis A Cases, Washoe County, 1988 – 2018



2. Population Affected

One (1) case of acute hepatitis A was reported in 2018. The case was a white, non-Hispanic male in the 30-39 year age group. The case was hospitalized.

C. Prevention and Control

1. Post- exposure Prophylaxis

The case was interviewed and exposed contacts were identified. One contact to the case was identified and reported to be immune.

Table 1.1 Disposition of HAV contacts, Washoe County, 2018 (n=1).

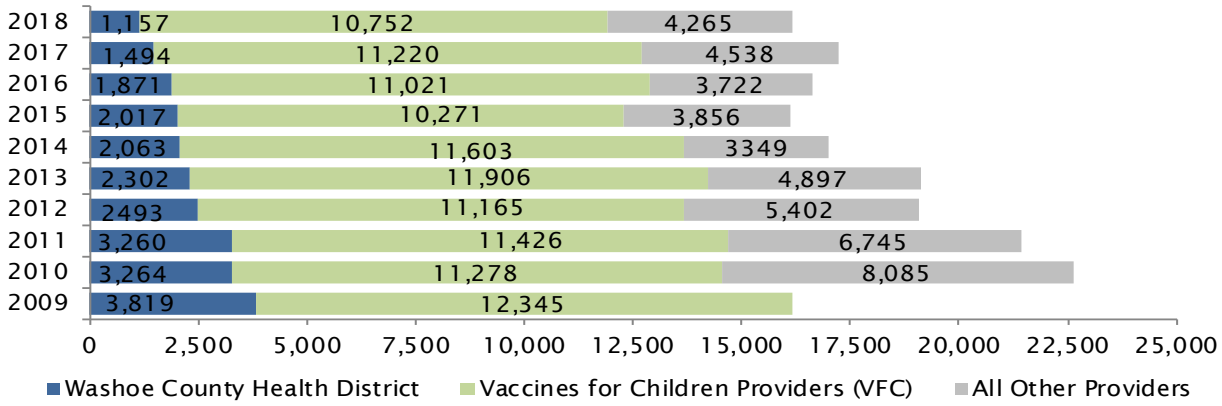
Disposition	Total	Percent
IG recommended and received*	0	0
IG recommended but contact non-compliant	0	0
Immune	1	100
Beyond the timeframe for effective PEP	0	0
Vaccine recommended and received*	0	0
Vaccine recommended but contact non-complia	0	0
Total	**1**	**100**
Contact Index (number of contacts per case) = 1		

No outbreaks of hepatitis A were reported in 2018.

2. Routine Hepatitis A Vaccination

HAV vaccine first became available in 1995. Since 2002, HAV vaccination has been required for all students entering the Washoe County School District or any private educational setting in Washoe County.

Figure 1.4 Total Doses of HAV Vaccine Administered, Stratified by Provider, 2009 – 2018



II. Hepatitis B Virus (HBV) Infection

A. Surveillance Case Definitions

1. Acute HBV Infection (2012 CDC case definition)

Clinical Description

An acute illness with a discrete onset of any sign or symptom* consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) levels >100 IU/L.

*A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test (either HBsAg, hepatitis B "e" antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does not require an acute clinical presentation to meet the surveillance case definition.

Laboratory Criteria for Diagnosis

- HBsAg positive, AND
- Immunoglobulin M (IgM) antibody to hepatitis B core antigen (IgM anti-HBc) positive (if done)

Case Classification

Confirmed

A case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis B.

2. Chronic Hepatitis B (2012 CDC case definition)

Clinical Description

No symptoms are required. Persons with chronic hepatitis B virus (HBV) infection may have no evidence of liver disease or may have a spectrum of disease ranging from chronic hepatitis to cirrhosis or liver cancer.

Laboratory Criteria for Diagnosis

- Immunoglobulin M (IgM) antibodies to hepatitis B core antigen (IgM anti-HBc) negative AND a positive result on one of the following tests: hepatitis B surface antigen (HBsAg), hepatitis B e antigen (HBeAg), or nucleic acid test for hepatitis B virus DNA (including qualitative, quantitative and genotype testing), OR

- HBsAg positive or nucleic acid test for HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive two times at least 6 months apart (Any combination of these tests performed 6 months apart is acceptable)

Case Classification

Probable

A person with a single HBsAg positive or HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive lab result and does not meet the case definition for acute hepatitis B.

Confirmed

A person who meets either of the above laboratory criteria for diagnosis.

Comment(s)

Multiple laboratory tests indicative of chronic HBV infection may be performed simultaneously on the same patient specimen as part of a "hepatitis panel." Testing performed in this manner may lead to seemingly discordant results, e.g., HBsAg-negative AND HBV DNA-positive. For the purposes of this case definition, any positive result among the three laboratory tests mentioned above is acceptable, regardless of other testing results. Negative HBeAg results and HBV DNA levels below positive cutoff level do not confirm the absence of HBV infection.

B. Epidemiology

Hepatitis B virus (HBV) is transmitted from person-to-person through activities that involve percutaneous or mucosal contact with infectious blood or body fluids. Approximately 2%-6% of adults will become chronically infected after an acute HBV infection and 90% of infants infected with HBV at birth will remain chronically infected.

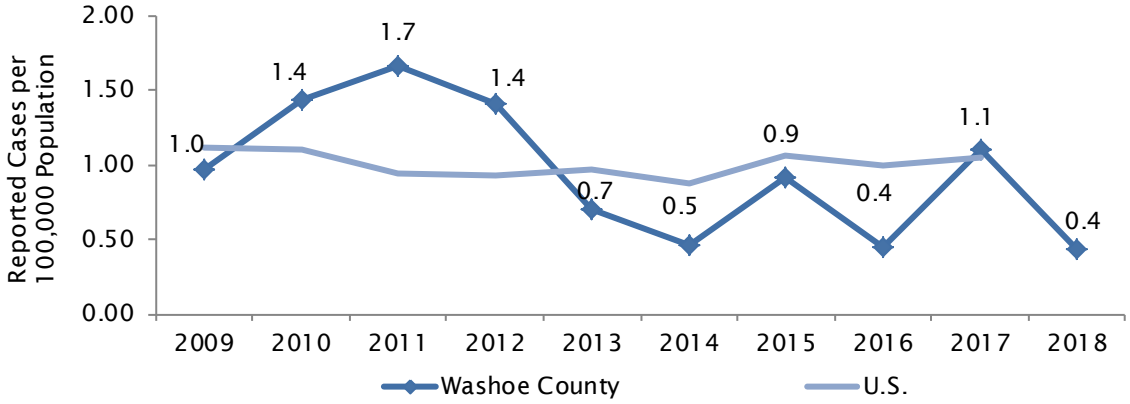
An estimated 850,000 – 2.2 million persons in the U.S have chronic HBV infection, and are a reservoir for transmission of HBV. Household, sexual, and needle-sharing contacts of persons with chronic HBV infection are at high risk to contract HBV and should be vaccinated. Individuals with a chronic HBV infection may remain asymptomatic or develop more serious complications like cirrhosis or liver cancer.

1. Acute Hepatitis B

a. Reported Incidence

Two (2) laboratory-confirmed cases of acute hepatitis B were reported in Washoe County in 2018 for an incidence rate of 0.4 cases per 100,000 population. The incidence rate was 0.4 cases per 100,000 population among individuals 19 years of age and older in 2018. The Healthy People 2010 national health objective for acute HBV infection used to be divided into specific age groups; however, the HP 2020 objective for acute HBV infection is now 1.5 cases per 100,000 in adults aged 19 years and older. In 2017, the national incidence rate of acute hepatitis B was 1.05 case per 100,000 population, which was the most current data.

Figure 2.1 Rates of Reported Cases of Acute Hepatitis B, Washoe County, 2009 – 2018



b. Population Affected

In 2018, two (2) cases of acute hepatitis B were reported. One case was in each of the following age groups: 40-49 and 50-59 years. One was male and one was female. Both cases identified as White, non-Hispanic. One case was hospitalized. No deaths were reported.

Figure 2.2 Reported Cases of Acute Hepatitis B by Age and Gender, Washoe County, 2018 (n=2).

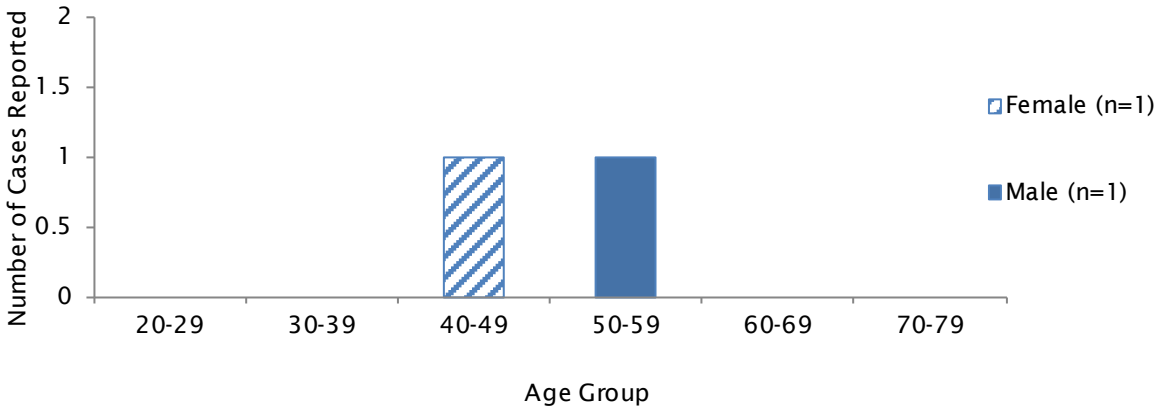


Table 2.1 Reported Risk Factors among Acute Hepatitis B Cases, Washoe County, 2018

Risk Factor (not mutually exclusive)	Number of Cases	%
No history of HBV vaccine	1	50
Ever treated for a sexually transmitted disease	0	0
Injected drugs not prescribed by a doctor	1	50
Dental work or oral surgery	0	0
Incarcerated for longer than 24 hours	0	0
Male with sexual contact with 2-5 female partners	0	0
Female with sexual contact with 1 male partner	0	0
Male with sexual contact with 1 female partner	0	0
MSM (man with sexual contact with male partner)	1	50
Used street drugs but did not inject	0	0
Hospitalized	0	0
Surgery	0	0
Incarcerated for longer than 6 months	0	0
Tattoo	0	0
IV infusions and/or injections in outpatient setting	0	0
Blood exposure (not health care related, includes sharing needles)	0	0
Sexual contact of a person with confirmed acute or chronic HBV infection	0	0
Denied any risk factors	0	0
Unknown*	2	100

* Unable to locate for an interview

2. Chronic Hepatitis B

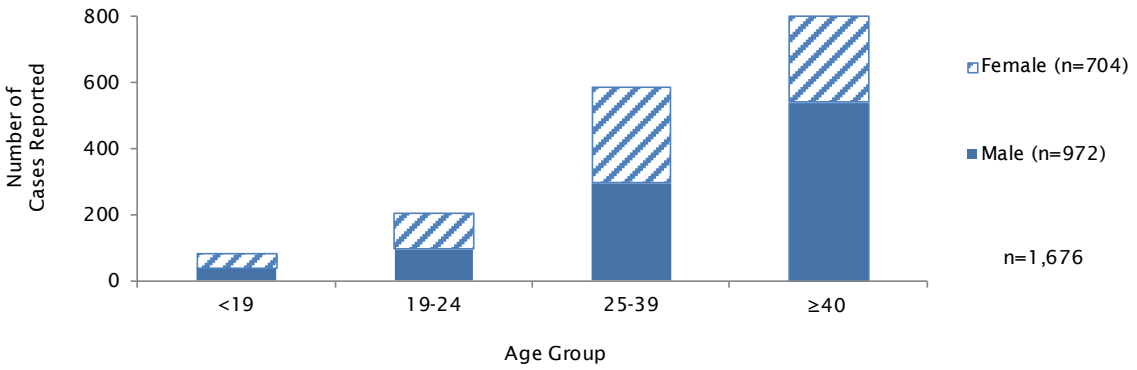
a. Reported Incidence

From 1990-2018, 1676 unique (non-duplicate) cases of chronic HBV infection have been reported in Washoe County. Of the 62 cases reported in 2018, none had been previously reported. Twenty-eight (28) of the 62 newly reported chronic HBV cases (45%) were female.

Nine (9) pregnant women with chronic HBV infection were reported in 2018. Six (6) cases (67%) were newly reported. One case moved out of the country, one pregnancy was terminated due to fetal anomalies, and one case had not been reported to the program prior to delivery. Seven (7) of the 9 women (78%) delivered in 2018. One (1) women (11%) had not given birth as of December 31, 2018.

b. Population Affected

Figure 2.5 Chronic HBV Cases by Age at Time of Diagnosis and Gender, Washoe County, 1990-2018



Persons born in HBV-endemic areas such as Southeast Asia, Africa, the Amazon Basin in South America, the Pacific Islands and the Middle East are at higher risk of acquiring HBV infection at birth. Up to 90% of infants infected at birth will develop chronic HBV infection.

Figure 2.6 Chronic HBV Cases by Race/Ethnicity, Washoe County, 1990-2018

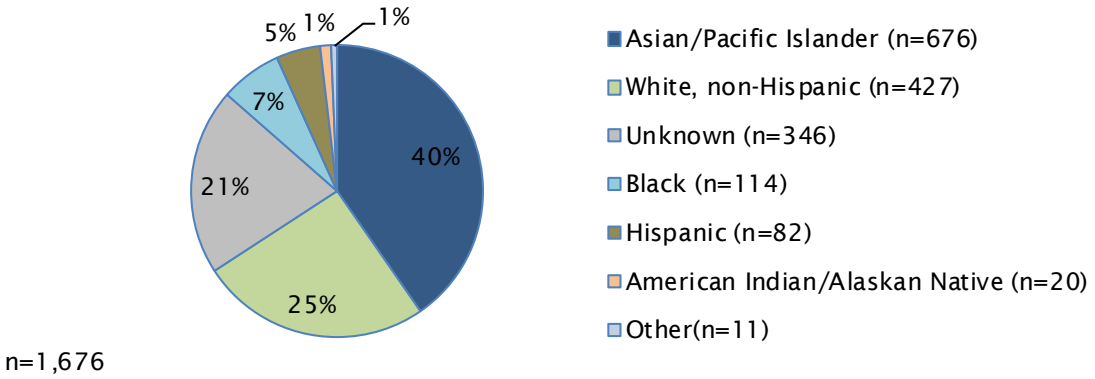


Figure 2.7 Newly Reported Chronic HBV Cases by Age and Gender, Washoe County, 2018

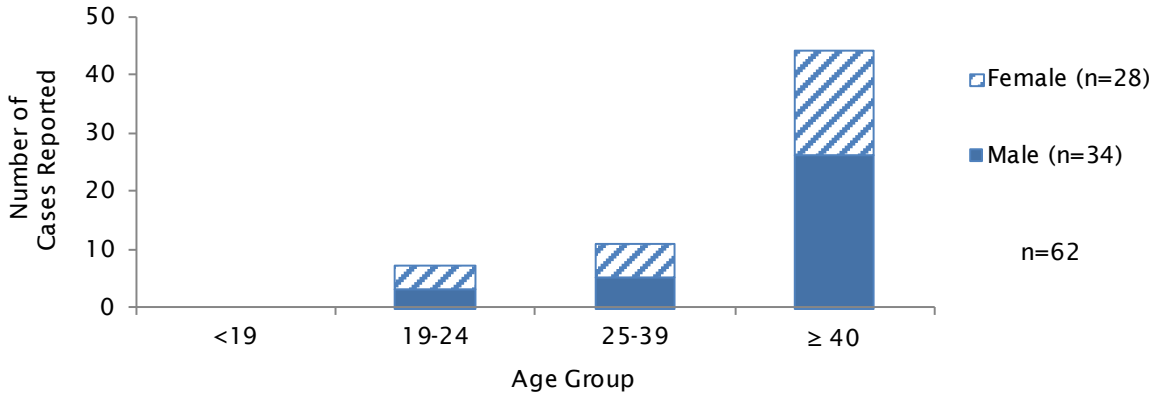
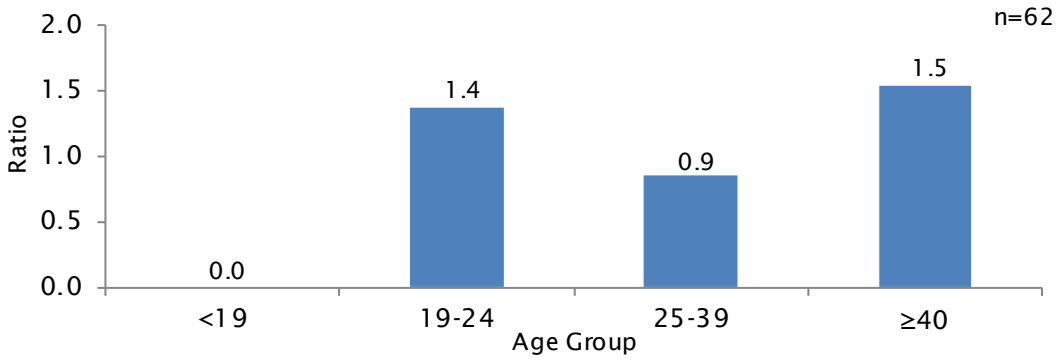


Figure 2.8 Age-Specific Ratio* of Newly Reported Chronic HBV Cases, Washoe County, 2018



*Ratios were calculated by:

$$\frac{\%\text{ of cases in age group}}{\%\text{ of overall population in age group}}$$

The age-specific ratio provides an easy way to see if a particular age group is being more impacted by a disease than would be expected based on the number of individuals in that age group. Figure 2.8 demonstrates that the 40 years and older age group is more heavily impacted.

In 2015, due to reduced program personnel, active surveillance for non-prenatal chronic hepatitis B was discontinued. The system only documents data available on the laboratory report. Therefore, a large proportion of newly reported cases are missing race/ethnicity information (Figure 2.9)

Figure 2.9 Newly Reported Chronic HBV Cases by Race/Ethnicity, Washoe County, 2018

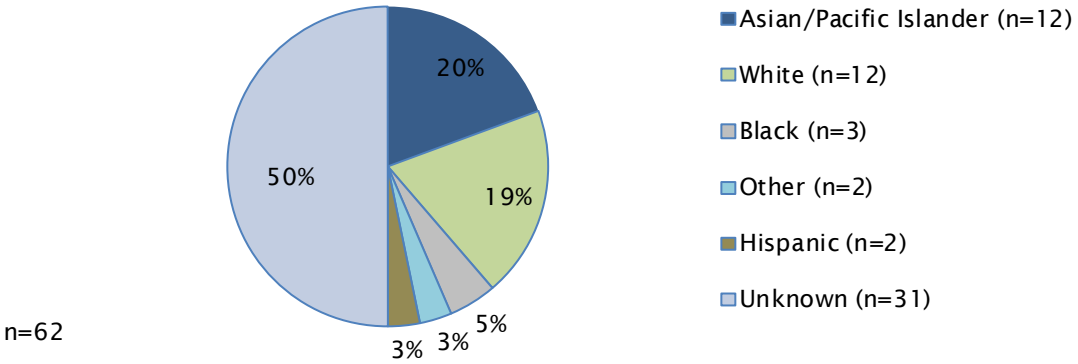
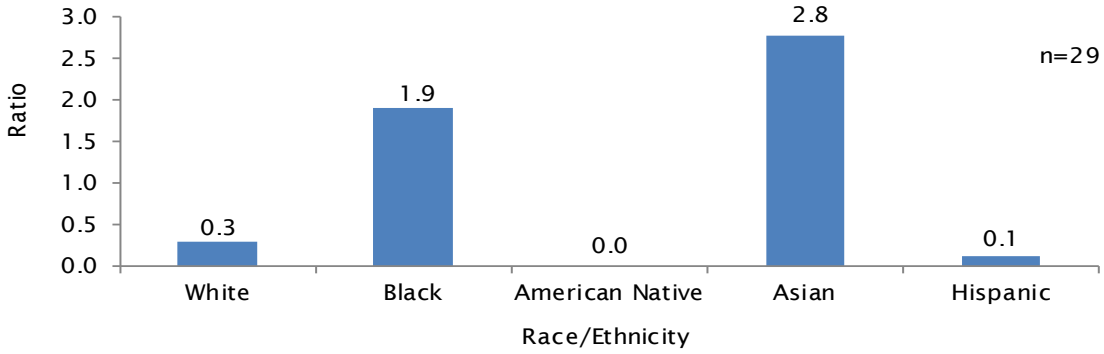


Figure 2.10 Race/Ethnicity-Specific Ratio* of Newly Reported Chronic HBV Cases, Washoe County, 2018



(Thirty three cases with unknown or other race/ethnicity)

*Ratios were calculated by:

$$\frac{\%\text{ of cases in race/ethnicity group}}{\%\text{ of overall population in race/ethnicity group}}$$

The race/ethnicity-specific ratio provides an easy way to see if a particular race/ethnicity group is being more impacted by a disease than would be expected based on the number of individuals in that group. Figure 2.10 demonstrates that the Asian and Black populations are more heavily impacted.

Figure 2.11 Pregnant Women with Chronic HBV by Race/Ethnicity, Washoe County, 2018

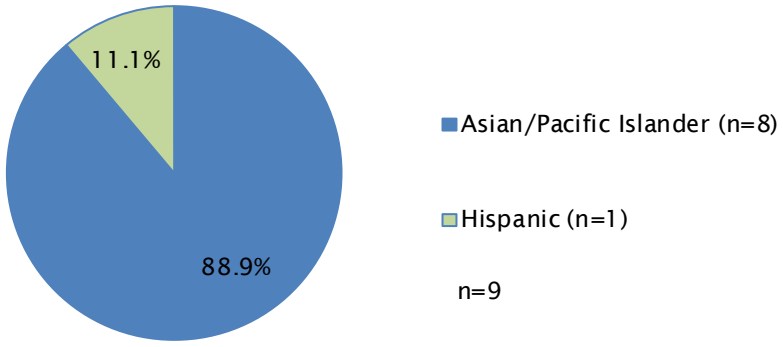


Figure 2.12 Pregnant Women with Chronic HBV by Birth Country, Washoe County, 2018

B. Prevention and Control

Beginning in 2014, due to restricted program resources, testing and/or vaccinations have only been provided to household and sexual contacts of perinatal HBV cases and acute HBV cases.

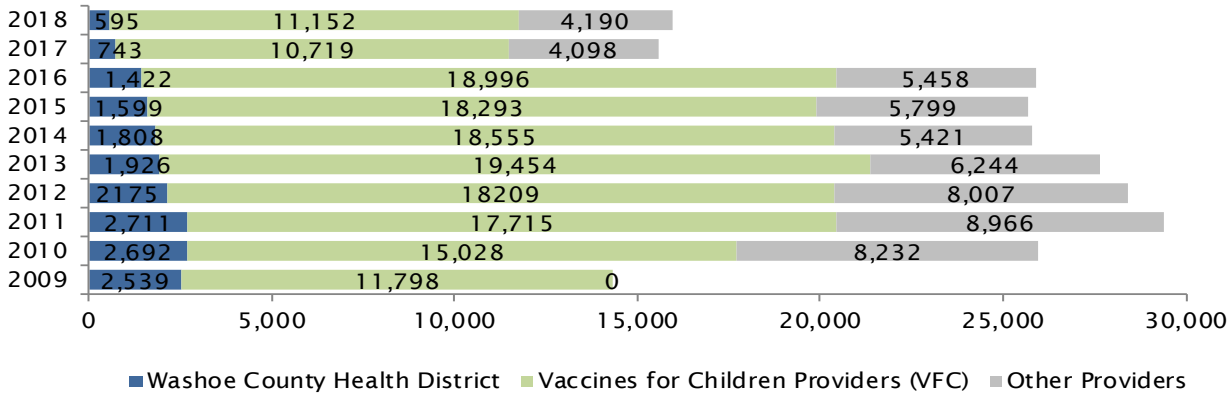
1. Hepatitis B Immune Globulin (HBIG) for Postexposure Prophylaxis

No sexual contacts of an acute hepatitis B case received HBIG in 2018.

2. Routine Hepatitis B Vaccination

In Washoe County, HBV vaccine has been given routinely to infants since 1993. In 1997, an adolescent HBV immunization initiative began to close the gap among middle school children. Nevada Administrative Code (NAC) 392.105 and 394.190 requires all children entering a Nevada school (public or private) for the first time to be immunized against HBV.

Figure 2.13 Doses of HBV Vaccine Given, Stratified by Provider, 2009 – 2018



3. Infants Born to HBsAg- Positive Women

Nine (9) infants were born to women with chronic HBV infection in 2018. All infants (100%) received HBIG and HBV vaccine within 12 hours of birth, as recommended. In 2018, births to women with chronic HBV infection accounted for 0.20% of the 5,961 births (internal unpublished data) that occurred in Washoe County.

Eight (8) infants completed post-vaccination seroscreening in 2018. Seven (7) infants were born in 2017 and one (1) was born in 2018.

Eight (8) infants who were post-vaccination tested in 2018 and who were positive for anti-HBs and negative for HBsAg, received perinatal intervention with HBIG and HBV vaccine.

Table 2.4 Post-Vaccination Testing of Infants Born to HBsAg-Positive Women, Washoe County, 2018

	Test Results		HBIG Within	Hep B Dose 1 Within
Total Sero-screened	HBsAg negative	anti-HBs positive	12 Hrs. of Birth	12 Hrs. of Birth
8	8	8	8	8
% of total	100	100	100	100

III. Hepatitis C

A. Surveillance

1. Surveillance Case Definitions

a. Acute Hepatitis C (2016 CDC Case Definition)

Clinical Criteria
An illness with discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), AND
(a) jaundice, OR
(b) a peak elevated serum alanine aminotransferase (ALT) level >200 IU/L during the period of acute illness.

Laboratory Criteria for Diagnosis
- A positive test for antibodies to hepatitis C virus (anti-HCV)
- Hepatitis C virus detection test:
    - Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative or genotype testing)
    - A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen)*

*When and if a test for HCV antigen(s) is approved by FDA and available.

Case Classification
Confirmed

- A case that meets clinical criteria and has a positive hepatitis C virus detection test (HCV NAT or HCV antigen), **OR**
- A documented negative HCV antibody, HCV antigen or NAT laboratory test result followed within 12 months by a positive result of any of these tests (test conversion).

Probable
- A case that meets clinical criteria and has a positive anti-HCV antibody test, but has no reports of a positive HCV NAT or positive HCV antigen tests, **AND**
- Does not have test conversion within 12 months or has no report of test conversion.

b. Chronic Hepatitis C (2016 CDC case definition)

Clinical Criteria
No available evidence of clinical and relevant laboratory information indicative of acute infection. Most hepatitis C virus (HCV)-infected persons are asymptomatic; however, many have chronic liver disease, which can range from mild to severe.

Laboratory Criteria for Diagnosis

- A positive test for antibodies to hepatitis C virus (anti-HCV)
- Hepatitis C virus detection test:
    - Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative or genotype testing)
    - A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen)*
      *When and if a test for HCV antigen(s) is approved by FDA and available.

Case Classification

Confirmed

- A case that does not meet clinical criteria or has no report of clinical criteria, **AND**
- Does not have test conversion within 12 months or has no report of test conversion, **AND**
- Has a positive HCV NAT or HCV antigen test.

Probable

- A case that does not meet clinical criteria or has no report of clinical criteria, **AND**
- Does not have test conversion within 12 months or has no report of test conversion, **AND**
- Has a positive anti-HCV antibody test, but no report of a positive HCV NAT or positive HCV antigen test.

B. Epidemiology

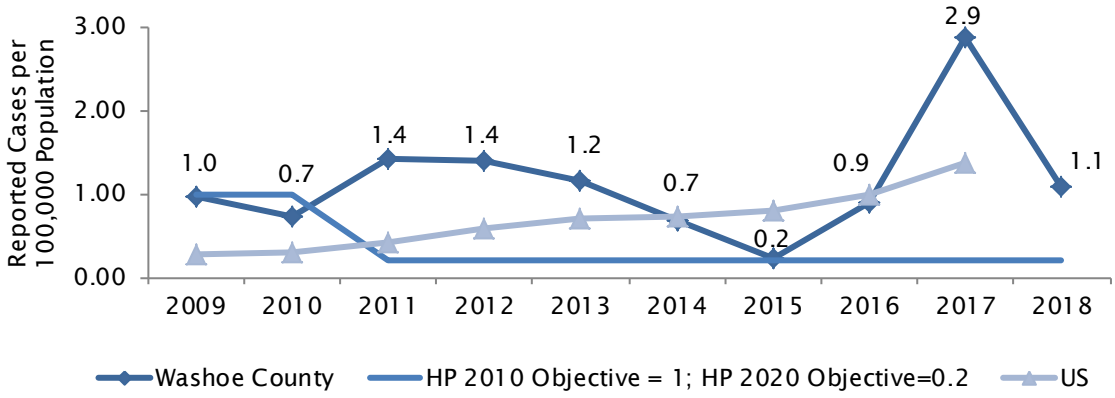
Chronic liver disease was the 9th leading cause of death in Washoe County and Nevada in 2017. Population-based studies indicate that 40% of chronic liver disease is HCV-related. Hepatitis C virus (HCV) infection is the most common chronic blood-borne infection in the United States. This virus usually is transmitted primarily through large or repeated percutaneous exposures to blood – for example, through sharing of equipment between injection drug users. Approximately 75% - 85% of persons with acute HCV infection will develop chronic HCV infection. An estimated 3.5 million persons in the U.S have chronic HCV infection. Most HCV-infected people are asymptomatic and may not be aware of their infection. They are a source of HCV to others and are at risk for chronic liver disease.

1. Acute Hepatitis C

a. Reported Incidence

In 2018, five (5) cases of laboratory-confirmed acute HCV infection were reported in Washoe County for a rate of 1.1 cases per 100,000 population. The Healthy People 2020 national health objective is 0.2 acute cases per 100,000 population. In 2017, the national incidence rate of acute hepatitis C was 1.36 case per 100,000 population, the most current national data.

Figure 3.2 Rate of Reported Cases of Acute Hepatitis C, Washoe County, 2009–2018



b. Population Affected

In 2018, five cases of acute hepatitis C were reported. There were two males and three females. Three cases were white, non-Hispanic, one case was Native American/Alaskan Native, and one case was Hispanic. Three cases were hospitalized for their illness. No deaths were reported. Three cases provided a complete exposure history and one case had risk factors identified from medical chart review. All four had at least one risk factor for disease. The most frequently reported risk factors included injection with drugs not prescribed by a doctor (2), use of non-injected street drugs (2), treatment for a sexually transmitted disease (2), and a finger stick in a home/clinic (2).

2. Hepatitis C Infection – Past or Present

a. Case Reports

WCHD received a total of 13,561 positive HCV test results from laboratories between May 1, 2002 and December 31, 2018. Of the 13,561 lab reports, 10,495 (77%) were Washoe County residents, which corresponded with a prevalence of 2.29% in Washoe County. Of 10,495 reported cases, 720 (6.9%) were newly reported in 2018.

Table 3.1 Hepatitis C Cases by Case Classification, Washoe County, May 2002 – December 2018 (Lab data only).

Case Classification	No. Cases	%
Acute Hepatitis C	75	0.7
Perinatal	1	0.0
Confirmed HCV Infection, Past or Present	7,978	76.0
Probable HCV Infection, Past or Present	589	5.6
Unable to be Classified	874	8.3
Did Not Meet Case Definition	978	9.3
Total	10,495	100.0

b. Reported Hepatitis C Cases by Hepatitis A and B Markers

If persons with chronic HCV infection contract HAV or HBV, they are at increased risk for life-threatening fulminant hepatitis. To protect susceptible HCV-infected patients, HAV and HBV vaccinations are strongly recommended.

A significant proportion of cases had unknown status for immunity to HAV and HBV.

Table 3.5 Reported Hepatitis C Cases by Hepatitis A and B Markers, Washoe County, May 2002 – December 2018 (N=9517, lab data only).

Marker	Positive		Negative		Unknown	
	No.	%	No.	%	No.	%
Antibody to HAV, total (anti-HAV)	818	8.6	364	3.8	8,335	87.6
Hepatitis B Surface Antibody (anti-HBs)	638	6.7	649	6.8	8,230	86.5
Hepatitis B Surface Antigen (HBsAg)	97	1.0	3,285	34.5	6,135	64.5
Hepatitis B Core Antibody, total (anti-HBc)	608	6.4	387	4.1	8,522	89.5

One time co-infection evaluation performed in 2013 using cross-matching analysis between hepatitis C and hepatitis B surveillance systems showed an additional 13 cases who also had reported hepatitis B infection during the time period May 1, 2002-December 2012; however, these 13 reports were not captured in the hepatitis C surveillance system because no concurrent laboratory tests for hepatitis B and C had been ordered.

c. Reported Hepatitis C Cases by Genotype

Genotype refers to the genetic make-up of an organism or a virus. There are at least 7 distinct HCV genotypes and more than 67 subtypes that have been identified. Genotype 1 is the most common in the United States. It is necessary to do viral genotyping when managing a person with chronic hepatitis C as it is helpful in making recommendations regarding treatment. Knowing the genotype can help predict the likelihood of treatment success and, in many cases, determine the duration of treatment. [1]

[1] https://www.cdc.gov/hepatitis/hcv/hcvfaq.htm

The goal of treatment is sustained virologic response (SVR), which is the continued absence of detectable HCV RNA at least 12 weeks after completion of therapy. SVR is a marker for a cure of HCV infection. Since the introduction of highly effective HCV protease inhibitor therapies in 2011, treatment options for hepatitis C have been rapidly progressing and new drugs continue to become available. Current treatment options include Daclatasvir, Elbasvir-Grazoprevir, Glecaprevir-Pibrentasvir, Ledipasvir-Sofosbuvir, Ombitasvir-Paritaprevir-Ritonavir, Ombitasvir-Paritaprevir-Ritonavir and Dasabuvir, Peginterferon alfa-2a, Peginterferon alfa-2b, Ribavirin, Simeprevir, Sofosbuvir, Sofosbuvir-Velpatasvir, and Sofosbuvir-Velpatasvir-Voxilaprevir.[2] Recommendations for hepatitis C treatment and management have been developed by the Infectious Diseases Society of America (IDSA) and American Association for the Study of Liver Diseases (AASLD), in collaboration with the International Antiviral Society–USA (IAS–USA). These recommendations can be accessed at http://www.hcvguidelines.org/.

Of 9, 517 lab-confirmed case reports, 2,830 (30%) contained documented genotypes, which likely indicated that a relatively small proportion of persons with HCV infection were actually in therapy. Of 2,830 cases with a documented genotype, 1,928 (68%) had genotype 1; 395 (14%) had genotype 2; and 457 (16%) had genotype 3; and 50 (2%) had 2 or more genotypes or other genotypes. It is important to note that superinfection (more than one genotype of HCV) is possible if risk behaviors (e.g., intravenous drug use) for HCV infection continue, but it is believed to be very uncommon.

d. Reported Hepatitis C Cases by Mortality

Of 9,517 cases, at least 472 (5%) expired. Of these 472 expired cases, Hepatitis C was the primary cause of death in 77 cases (16%) and the secondary cause of death in 362 cases (77%).

e. Population Affected

WCHD Surveillance data 2002-2018 indicate:

- 63% of cases are in the 40-59 year age group among 9,479 cases with known age and 68% of cases were born between 1945 and 1965 (baby boomers).
- 65% of cases are male among 9,437 cases with known gender.
- 33% of the case reports (3,109 cases) were missing information on race/ethnicity.
- 82% of cases are White, non-Hispanic among 6,408 cases with known race/ethnicity.
- African Americans are disproportionately affected by chronic HCV infection. They have the highest ratio of proportion of cases to proportion of the population.

The proportion of the cases aged 30 and younger has been increasing over the past several years. A special analysis was done. The proportion has increased from below

[2] https://www.hepatitisc.uw.edu/page/treatment/drugs.

8% prior to 2012 to 12.5% in 2014, 15.1% in 2017, and 17.5% in 2018. See Figure 3.3.

Figure 3.3 Reported Hepatitis C among Persons Aged ≤ 30 Years, Washoe County, 2005-2018

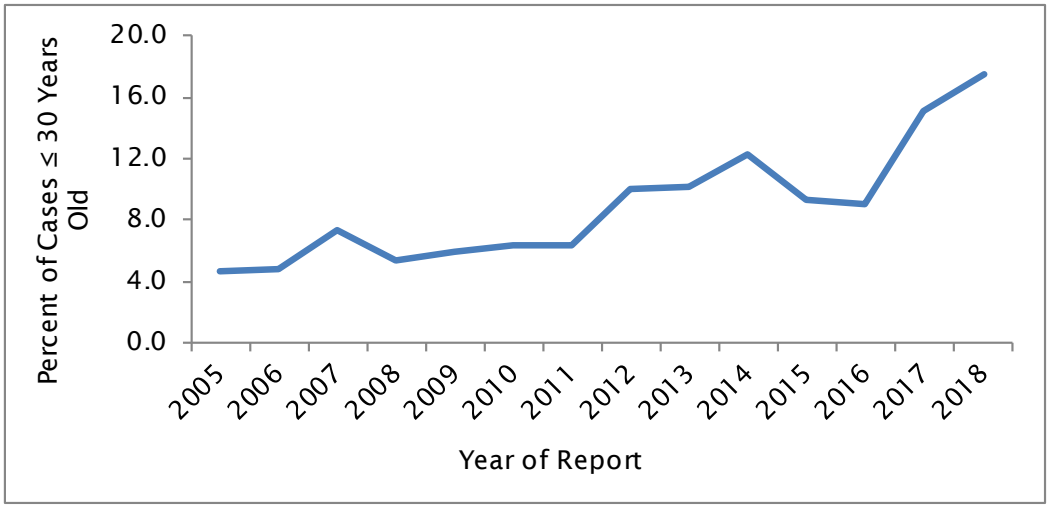


Table 3.6 Reported Cases of Hepatitis C by Age, Gender, Race and Ethnicity, Washoe County, May 2002 – December 2018

Demographic Characteristics		No. Cases	%	% population	Ratio*
Age Group	<20	63	0.7	25.9	0.0
	20-29	609	6.4	13.9	0.5
	30-39	1,101	11.6	13.8	0.8
	40-49	2,541	26.7	11.8	2.3
	50-59	3,388	35.6	12.7	2.8
	>=60	1,777	18.7	21.8	0.9
	Unknown	38	0.4		
	Total	9,517	100.0	100.0	
Gender	Male	6,118	64.8	50.3	1.3
	Female	3,319	35.2	49.7	0.7
	Total	9,437	100.0	100.0	
Race/Ethnicity	American Indian/Alaska Native, non-Hispa	147	2.3	1.6	1.4
	Asian/Pacific Islander, non-Hispanic	73	1.2	7.0	0.2
	African American, non-Hispanic	465	7.3	2.5	2.9
	White, non-Hispanic	5,255	82.8	63.6	1.3
	Hispanic	403	6.4	25.3	0.3
	Total	6,343	100.0	100.0	

*Ratios were calculated by:

$$\frac{\text{\% of demographic group with condition}}{\text{\% of overall population comprised by this demograph group}}$$

3. Prevention and Control

There is no vaccine against HCV, no funding for screening high-risk persons, and no funding for vaccinating persons with chronic HCV against HAV and HBV, as well as no funding for treatment. Prevention and control of HCV are limited to education and the collection, analysis and dissemination of data:

- HCV surveillance began on May 1, 2002.
- Sixteen (16) issues of *Epi News* were written and distributed to local health care providers during 2002-2018. These issues covered general information on hepatitis testing recommended actions and reviewed hepatitis surveillance project and results.
- A one-time survey was sent to 73 ordering health care providers, and 25 (34%) were returned. Of the 25 returned, 16 received the *Epi News;* 15 of the 16 who receive the *Epi News* said the information on HCV surveillance was useful; 6 of the 25 did not receive the *Epi News* and all 6 requested to be added to the distribution list.
- 1,500 CDC brochures on HCV prevention and HCV testing were distributed through Community Clinic (formerly Washoe Medical Center Clinic).
- A HCV section was added to the Washoe County Health District's website. There were 13,679 visits to this web page between May 2005 and December 2014. (Tracking of visits to this website began in May 2005). Due to restricted resources within the CD Program, no additional efforts to update this website were made after 2014. The statistics of web visits for since 2015 are not available due to a web management system change.
- The HCV webpage was revised in 2018 to include updated surveillance data, provider guidance and resources, and patient education materials.

OTHER REPORTABLE COMMUNICABLE DISEASES and CONDITIONS

I. Respiratory Syncytial Virus (RSV)

A. Epidemiology

1. Population Affected

Respiratory syncytial virus (RSV) is the most common cause of bronchiolitis and pneumonia among infants and children. Most children will have serologic evidence of RSV infection by 2 years of age. RSV also causes repeated infections throughout life, usually associated with moderate to severe cold-like symptoms. Severe lower respiratory tract disease may occur at any age, especially among the elderly or among those with compromised cardiac, pulmonary or immune systems.

In temperate climates, RSV infections usually occur during annual community outbreaks, and often last four to six months during the late fall, winter or early spring months. The timing and severity of outbreaks in a community vary from year to year.

2. Reported Incidence

Four hundred eighty (480) laboratory-confirmed cases of RSV were reported in Washoe County in 2018. Of the 480 cases, 431 (90%) were in children ≤ 2 years of age, which corresponds to an incidence of 2,565 cases per 100,000 children ≤ 2 years of age (population for this age group was 16,801 in 2018). The increase of the incidence rate is likely correlated with high incidence of influenza.

Figure 2.1 Rate of Reported Cases of RSV in Children ≤ 2 Years of Age, Washoe County, 2009-2018

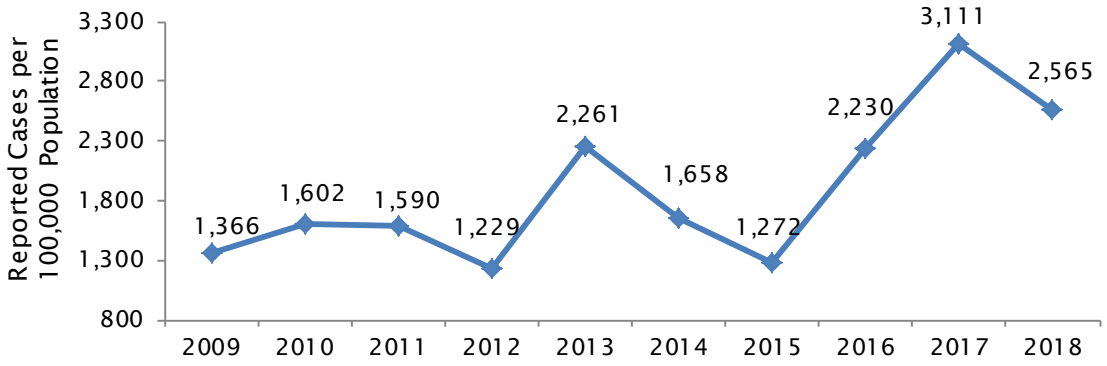
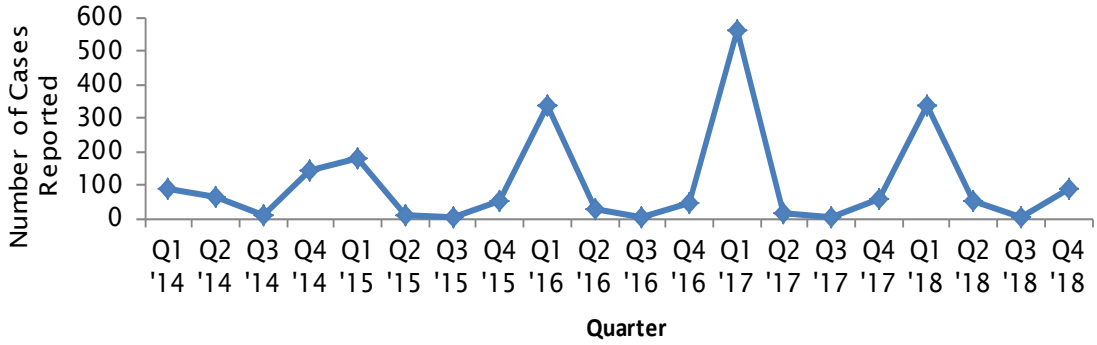


Figure 2.2 Reported RSV Cases By Quarter, Washoe County, 2014 – 2018



B. Prevention and Control

There is no vaccine currently available for RSV. Proper hygiene and environmental cleaning, especially in child care settings, can be effective in reducing transmission.

II. Viral Meningitis

A. Epidemiology

Viral meningitis is caused by infection with one of several types of viruses. About 90% of cases are caused by non-polio enteroviruses (e.g., coxsackievirus and echovirus). Enteroviruses are typically spread person-to-person through the fecal-oral route, respiratory droplets and fomites. Herpesvirus and the mumps virus can also cause meningitis. Clinicians rarely identify which virus causes meningitis. It is a diagnosis of exclusion and is most likely under-reported.

In all cases of viral meningitis the diagnosis is supported by a compatible clinical illness and laboratory tests that rule out possible bacterial etiologies.

1. Reported Incidence

Twenty-four (24) laboratory-confirmed cases of viral meningitis were reported in Washoe County in 2018 for a reported incidence of 5.2 cases per 100,000 population.

Figure 3.1 Rates of Reported Cases of Viral Meningitis, Washoe County, 2009-2018

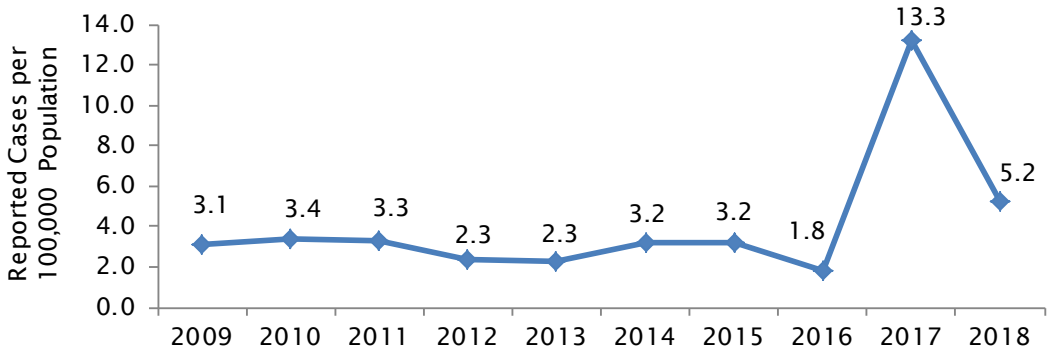
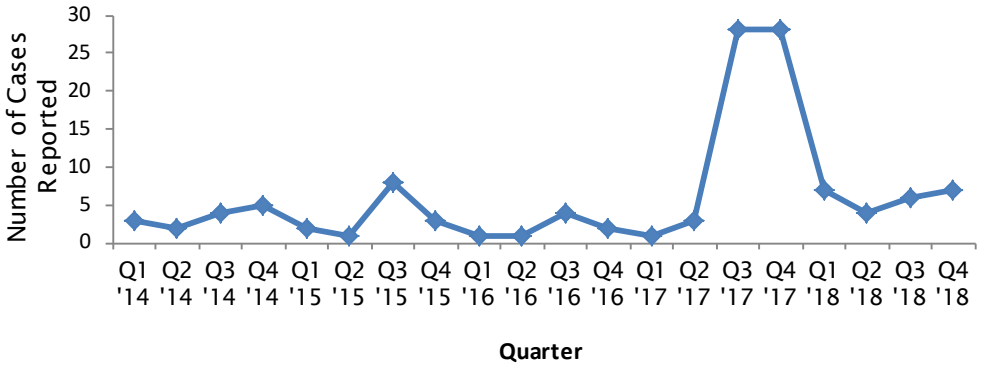


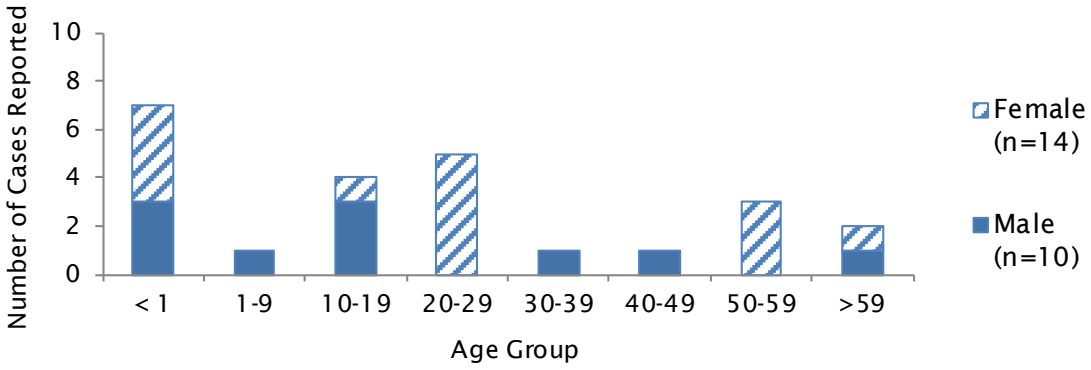
Figure 3.2 Reported Viral Meningitis Cases By Quarter, Washoe County, 2014-2018



2. Population Affected

The median age of cases in Washoe County was 20.5 years (range: <11 days - 76 years). Fourteen (14) cases (58%) were female.

Figure 3.3 Viral Meningitis Cases by Age and Gender, Washoe County, 2018 (n=24).



Fourteen (14) cases were White, non-Hispanic, six (6) Hispanic, one (1) Black, three (3) unknown races.

B. Prevention and Control

No specific prevention or control measures are available for non-polio enteroviruses. Adherence to good hygienic practices, such as frequent and thorough hand washing (especially after diaper changes and before eating or preparing food), disinfection of contaminated surfaces by household cleaners (e.g., diluted bleach solution), and avoidance of shared utensils and drinking containers, is recommended to help interrupt transmission.

III. Hansen's Disease (Leprosy)

A. Epidemiology

Hansen's disease is a chronic bacterial disease of the skin, peripheral nerves and upper airway caused by *Mycobacterium leprae*.

1. Reported Incidence

No cases of Hansen's disease were reported in Washoe County in 2018. From 1994 through 2018 only five (5) cases of Hansen's disease have been reported in Washoe County. One case was reported in 2003, one in 2005, one in 2007, one in 2009, and one in 2012.

2. Population Affected

Worldwide, countries that reported more than 1,000 new cases of Hansen's disease to the World Health Organization (WHO) between 2011 and 2015 are:

- Africa: Democratic Republic of Congo, Ethiopia, Madagascar, Mozambique, Nigeria, United Republic of Tanzania
- Asia: Bangladesh, India, Indonesia, Myanmar, Nepal, Philippines, Sri Lanka
- South America: Brazil

There have been dramatic decreases in the global disease burden: from 5.2 million in 1985 to 805,000 in 1995 to 753,000 at the end of 1999 and 211,009 new cases registered in 2018.[1] Most adults around the world, however, may face no risk at all of becoming infected with Hansen's disease. That is because evidence shows that 95% of all adults are naturally (genetically) unable to get the disease, even if they are exposed to the bacteria that causes it.[2]

Newly recognized cases in the U.S. are few and are usually diagnosed in immigrants or refugees who acquired the disease in their native countries. In 2018, a total of 54 cases were reported in the U.S. Due to the large immigrant population in some states the disease is endemic in California, Florida, Hawaii, and Texas[3].

B. Prevention and Control

Prevention and control of new cases depends on early recognition and treatment with multidrug therapy. Clinical and laboratory evidence suggest that, in most cases, infectiousness is lost within one day of appropriate treatment. Isolation, quarantine and restrictions on employment and school attendance are not warranted.

IV. Community-Wide Surveillance for Carbapenemase Producing Organisms (CPO)

A. Epidemiology

Carbapenemase-producing organisms (CPO) are bacteria that are naturally found in the digestive system but have become resistant to a group of antibiotics known as carbapenems. CPO are often found in a number of countries around the world, particularly in the healthcare systems.

[1] http://www.who.int/en/news-room/fact-sheets/detail/leprosy
[2] http://www.cdc.gov/leprosy/exposure/index.html
[3] https://wonder.cdc.gov/nndss/static/2018/52/2018-52-table1.html

Surveillance Definitions:

Carbapenem Resistant Enterobacteriaceae (CRE)

- CRE are *Enterobacteriaceae* that are:
  - Resistant to ANY carbapenem antimicrobial (i.e., MIC of ≥ 4 mcg/ml for doripenem, meropenem, or imipenem OR ≥ 2 mcg/ml for ertapenem) OR
  - Documented to produce carbapenemase

In addition:

- For bacteria that have intrinsic imipenem nonsusceptibility (i.e., *Morganella morganii, Proteus spp., providencia spp.*), resistance to carbapenems other than imipenem is required.

Carbapenem Resistant *Pseudomonas aeruginosa* (CRPA)

- *Pseudomonas aeruginosa* isolated from any body site*, that meets the following criteria:
  - Resistant to imipenem, meropenem, or doripenem based on current Clinical and Laboratory Standards Institutes (CLSI) Standards M100 standards (≥ 8 mcg/mL); AND/OR
  - Demonstrates production of a carbapenemase by a recognized method (e.g. CarbaNP or PCR or other methods).

**Excluding isolates from patients with cystic fibrosis (CF).*

Carbapenem Resistant *Acinetobacter* (CRA)

- *Acinetobacter* isolated from any body site, that meets the following criteria:
  - Resistant to imipenem, meropenem, or doripenem based on current Clinical and Laboratory Standards Institutes (CLSI) Standards M100 standards; AND/OR
  - Demonstrates production of a carbapenemase by a recognized method (e.g. CarbaNP or PCR or other methods).

Carbapenem Resistant Organisms (CRO)

Any organisms meeting the above definitions for CRE, CRPA, and CRA are considered CRO. CRO are becoming increasingly common.

Carbapenemase Producing Organisms (CPO)

Any organisms producing carbapenemase which is laboratory-confirmed are defined as CPO. CPO is sometimes difficult to treat because they have a high level of resistance to antibiotics.

The CRO condition became reportable in Washoe County in January 2017. Since June 2010 Washoe County Health District has worked with local hospitals to conduct enhanced surveillance for Carbapenem Resistant Enterbacteriaceae infection.

Multi- Drug Resistant Bacilli–Carbapenem Resistant (MDRB-CR) (since 2010)

A case is defined as an infection with an MDRB-CR organism of one patient per hospitalization per year regardless of resident status. Infection with a second species of MDRB-CR organism in the same patient is counted as a separate case. Infections with those Gram negative bacilli that are constitutively resistant to carbapenems, specifically *Stenotrophomonas, Aeromonas & Chryseobacterium,* are not counted as cases.

MDRB-CR organisms refer to Gram negative bacilli that are resistant to three or more classes of antibiotics, one of which must be Carbapenem.

Duplicates (since 2010)
Duplicates are defined isolates from the same patient, same organism, and same source within the same year.

Patient's residency (since 2010)
Patients from out of jurisdiction are included in the surveillance report as long as isolates meet the above surveillance definitions.

Report Date (2018)
For this report, the date of specimen collection is used for case counts by month.

Table 4.1 Reported CPO by Month, Washoe County, 2018.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CRE	3	2	2	1	2	3	2	1	5	4	3	6	34
CRPA	6	1	7	4	3	6	8	1	8	8	5	6	63
CRA	0	0	0	0	0	1	0	0	0	0	0	0	1
Other CPO	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	9	3	9	5	5	10	10	2	13	13	8	12	99

2. Population Affected

Thirteen (13) cases of CPO were reported in 2018. Nine (70%) of these occurred in males, eight (61.5%) occurred in persons 60+ years of age. Forty-six contacts were identified with a case-contact ratio equal to 3.5.

Figure 4.1 Reported Cases of CPO by Age and Gender, Washoe County, 2018.

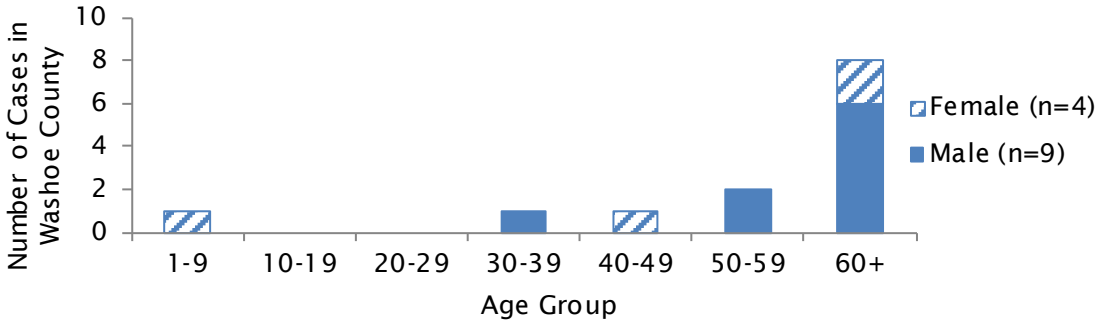
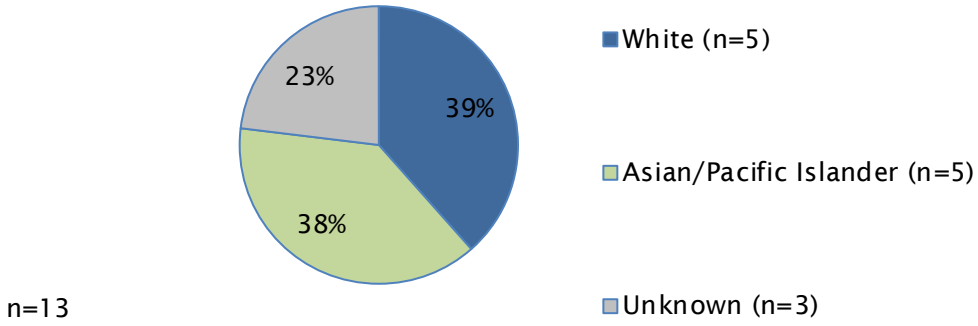


Figure 4.2 Reported Cases of CPO by Race/Ethnicity, Washoe County, 2018.



n=13

B. Prevention

To prevent the spread of CPO, health care personnel and facilities should follow infection control precautions:

- Wash hands with soap and water or an alcohol-based hand sanitizer before and after caring for a patient,
- Carefully clean and disinfect rooms and medical equipment,
- Wear gloves and a gown before entering the room of a CPO patient,
- Keep patients with CPO infections in a single room or have them share a room with someone else who has a CPO infection,
- Whenever possible, dedicate equipment and staff to CPO patients,
- Remove gloves and gown and wash hands before leaving the room of a CPO patient,
- Only prescribe antibiotics when necessary.

To prevent the spread of CPO, the public should:

- Avoid unnecessary exposures to health care measures in endemic countries, such as India, Taiwan, Turkey and others listed in "Carbapenemase-Producing Organisms: A Global Scourge."[1]
- Inform your health care professionals if you had a medical procedure done recently while travelling to an endemic country prior to a procedure (e.g. dialysis) or seeking treatment (e.g. Emergency room visit, elective surgery).

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5884739/

SEXUALLY TRANSMITTED DISEASES

I. *Chlamydia*

A. Epidemiology

Chlamydia trachomatis is the most frequently reported infectious disease in the United States. Pelvic inflammatory disease (PID) caused by *Chlamydia* is a major cause of infertility, ectopic pregnancy, and chronic pelvic pain. *Chlamydia* is transmitted through vaginal, anal, and oral sex. Pregnant women with C*hlamydia* can transmit the infection to their infants during delivery, causing neonatal ophthalmia and pneumonia.

1. Reported Incidence

In 2018, *Chlamydia* infection was the most commonly reported sexually transmitted disease (STD) in Washoe County with an incidence rate of 594 cases per 100,000 population. The 2017 national reported incidence rate was 528.8 cases per 100,000 population, which was the most current national data. The Healthy People 2020 national health objective for proportion of positive tests is as follows:

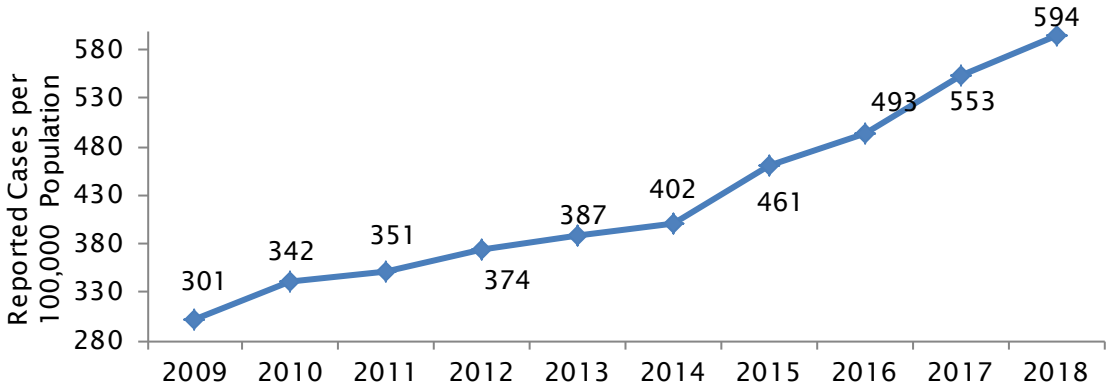
- Females aged 15-24 years attending family planning clinics 6.7 %

Note: The Healthy People 2010 health objective for the following categories have been removed from the HP 2020 health objectives.

- Females aged 15-24 years attending STD clinics 3.0 %
- Males aged 15-24 years attending STD clinics 3.0 %

An overall steady increase of reported *Chlamydia* infections has been observed since 1996. This increase may be the result of an expansion of *Chlamydia* screening, the use of increasingly sensitive diagnostic tests, improvement in case reporting from providers and laboratories, and/or a real increase in the incidence of *Chlamydia* infection. Due to national increases in the incidence of primary and secondary syphilis and gonorrhea in recent years, a real increase in the incidence of Chlamydia is most likely.

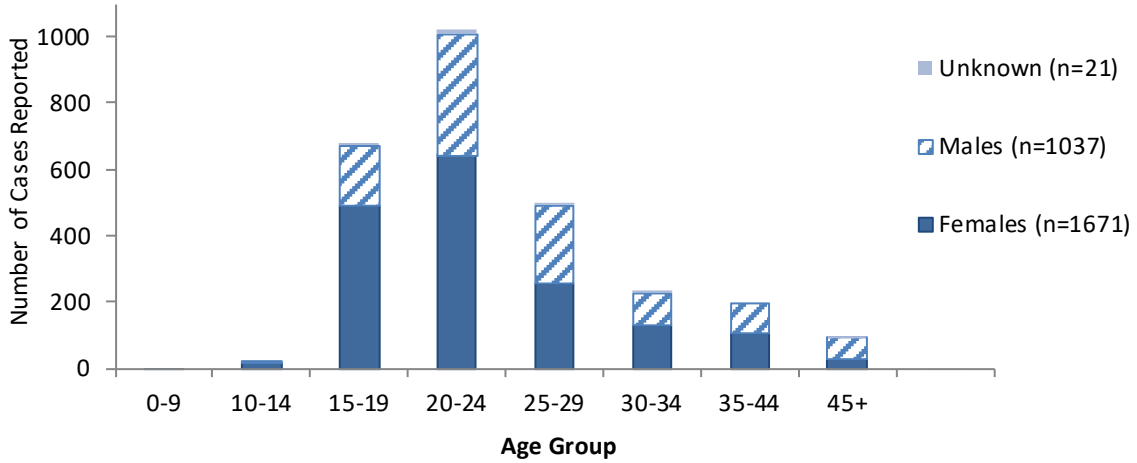
Figure 1.1 Rates of Reported *Chlamydia* Cases, Washoe County, 2009– 2018.



2. Population Affected

Of the 2,729 *Chlamydia* cases reported in 2018, 1,712 (62.7%) occurred in persons 15-24 years of age; and 1,671 (61.2%) occurred in females.

Figure 1.2 Reported Cases of *Chlamydia* by Age and Gender, Washoe County, 2018.



Black and Hispanic cases accounted for 9% and 29% of total *Chlamydia* cases, respectively. Blacks comprised 2.5 % and Hispanics 25% of Washoe County's population in 2018.

Figure 1.3 Rate of Reported Cases of *Chlamydia* by Race/Ethnicity, Washoe County, 2018.

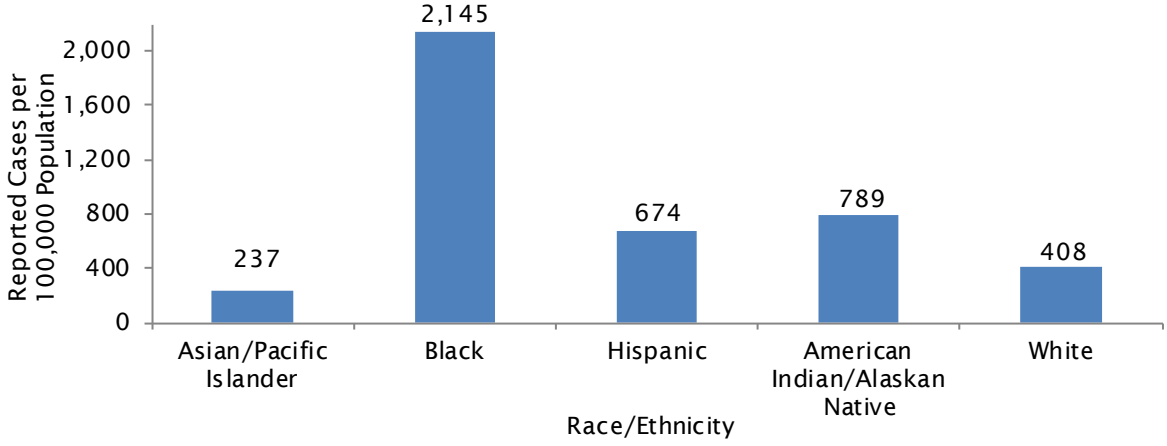
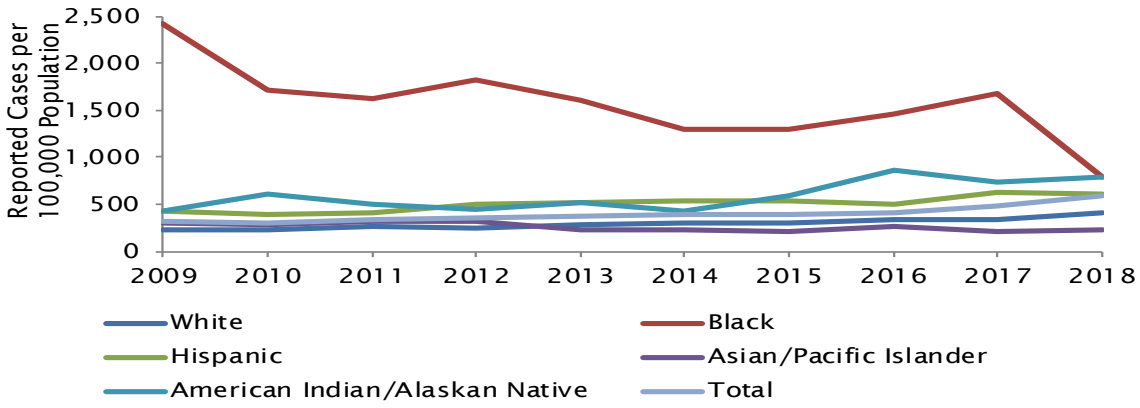


Figure 1.4 Rates of Reported Cases of *Chlamydia* by Race/Ethnicity, Washoe County, 2009-2018.



Chlamydia rates among females aged 15 to 44 years was 1,801.2 cases per 100,000 females in 2018 in comparison to 1,711.3 cases per 100,000 females in 15-44 year age group in 2017, a 5.3% increase.

B. Prevention and Control

To increase efficient use of resources, reduce duplication of services provided in the community, serve those at highest risk of STD infection and meet federal and regional testing recommendations, the Sexual Health Program has continued the following guidelines:

- Provide STD (Chlamydia, gonorrhea, syphilis, and HIV) testing at sites where a specific target population would be known to congregate and where a higher positivity rate has occurred during previous testing
- Cease testing at off-site locations that duplicate services already available to the target population
- Provide technical assistance to build the capacity of other, established agencies that provide STD testing
- Continue STD testing and screening per CDC recommendations

II. Gonorrhea

A. Epidemiology

Gonorrhea, caused by *Neisseria gonorrhoeae*, is second only to *Chlamydia* infections in the number of cases reported to the CDC. It is transmitted through sexual contact (vaginal, oral, or anal) and can also be transmitted from mother to child during birth. In both men and women, untreated infection can cause infertility.

1. Reported Incidence

In Washoe County, 918 laboratory-confirmed cases of gonorrhea were reported in 2018 for an incidence rate of 200 cases per 100,000 population, the highest

incidence ever during the past two decades. The 2017 national reported incidence was 191.5 cases per 100,000 population representing 18.1% increase compared with previous rate, which was the most current national data. The Healthy People 2010 national health objective is 19 cases per 100,000 population. The new Healthy People 2020 national health objectives to reduce gonorrhea rates are as follows:

- Females aged 15 to 44 years: 251.9 new cases per 100,000 population
- Males aged 15 to 44 years: 194.8 new cases per 100,000 population

Figure 2.1 Rates of Reported Cases of Gonorrhea, Washoe County, 2009–2018.

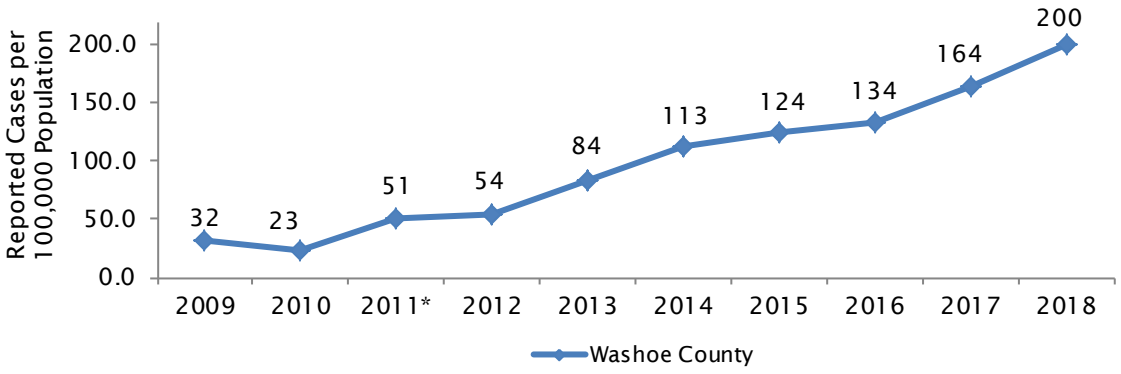
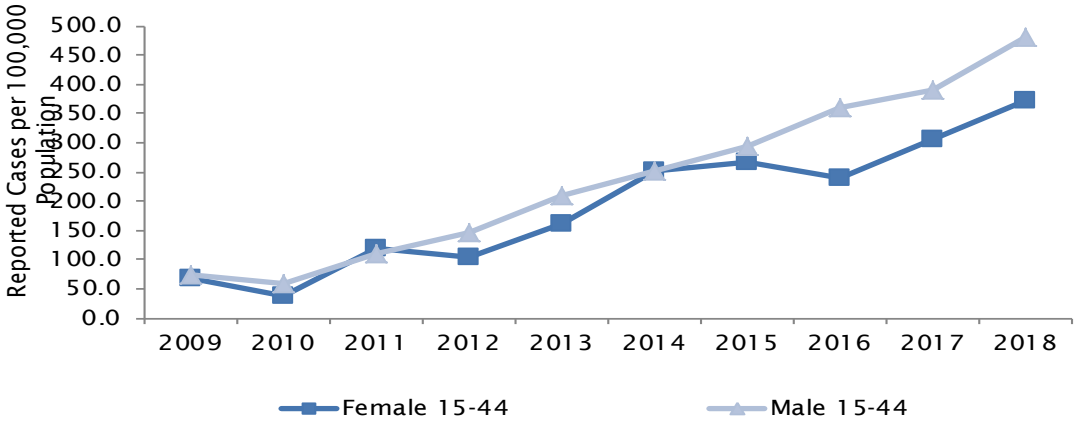


Figure 2.2 Rates of Reported Cases of Gonorrhea among Population Aged 15-44 Years, Washoe County, 2009 – 2018.



The increased incidence of gonorrhea in recent three years was concurrent with the increased incidence of syphilis, which is also consistent with the national trend.

2. Population Affected

The incidence of gonorrhea is highest in high-density urban areas among persons under 34 years of age who have multiple sex partners and engage in unprotected sexual intercourse. Increases in gonorrhea prevalence have been noted recently among men who have sex with men.

Of the 918 cases reported in 2018, 321 (35%) were persons aged 15-24 and 326 (35.5%) were persons aged 25-34; and 534 (58.2%) were males.

Figure 2.3 Reported Cases of Gonorrhea by Age and Gender, Washoe County, 2018.

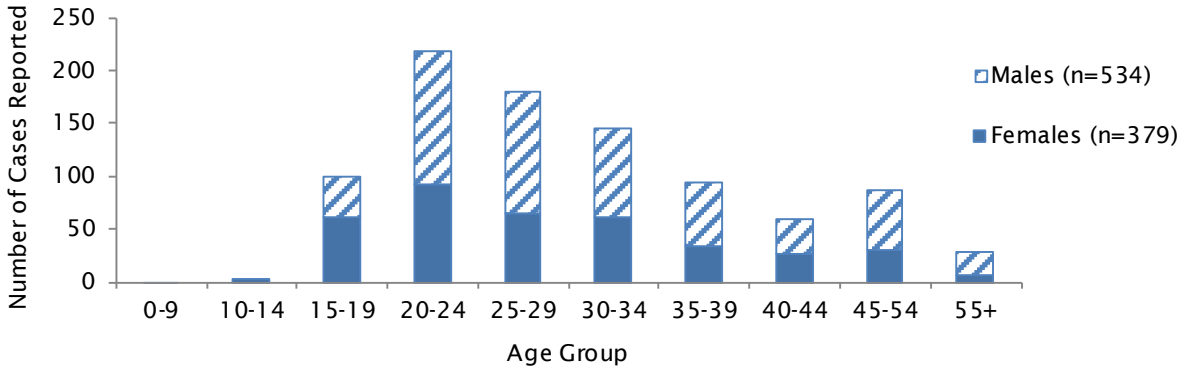


Figure 2.4 Reported Cases of Gonorrhea by Race/Ethnicity, Washoe County, 2018.

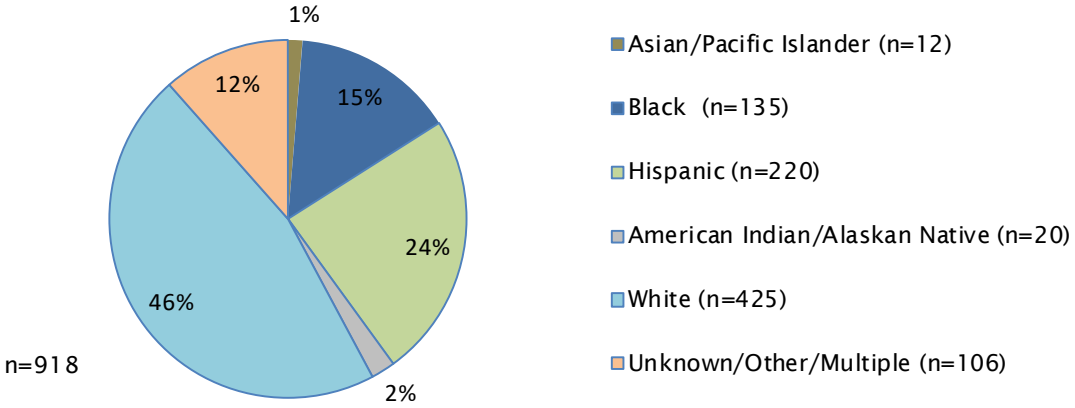


Figure 2.5 Rate of Incidence by Race/Ethnicity per 100,000 population of Gonorrhea Washoe County, 2018.

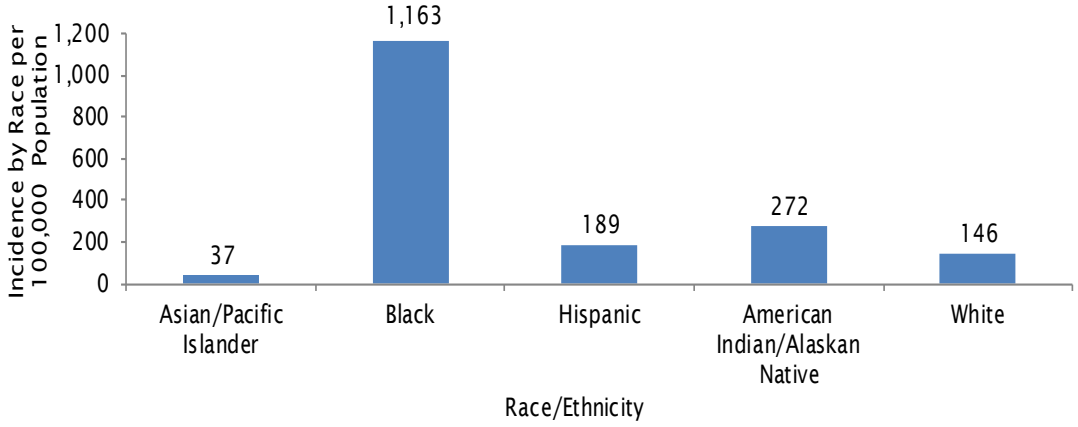
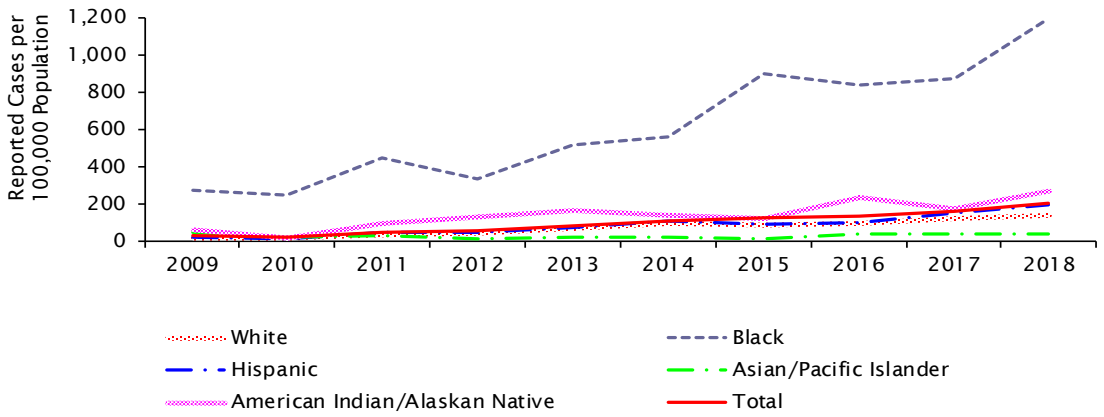


Figure 2.6 Rates of Reported Gonorrhea Cases by Race/Ethnicity, Washoe County, 2009-2018.



III. Syphilis

A. Epidemiology

Syphilis is a complex STD caused by the bacterium *Treponema pallidum.* The "primary" stage of syphilis is typically marked by the appearance of a single chancre that is usually firm, round, small and painless. The chancre may last 3-6 weeks, and heals on its own. The presence of a chancre greatly facilitates HIV transmission.

If adequate treatment is not administered, the infection progresses to the "secondary" stage marked by the appearance of a rough, red or reddish-brown rash on the trunk and extremities which, unlike most other kinds of rashes, may involve the palms of the hands and soles of the feet. Patchy hair loss or alopecia is sometimes exhibited. Syphilis is contagious during the primary and secondary stages.

Untreated syphilis progresses to a latent stage that is defined as having serological proof of infection without signs or symptoms of disease. In early latent syphilis (one year or less from time of infection) the disease may still be contagious. Late latent syphilis (infection for greater than one year) is not contagious but may progress to tertiary syphilis. Beginning in 2012, staff initiated reporting of early latent syphilis cases separate from the latent syphilis classification which includes late latent and unknown duration. This change is due to the complexity of diagnosing early latent cases and the possibility of early latent syphilis cases being contagious.

Tertiary syphilis is slowly progressive and may affect any organ. The more severe manifestations of tertiary syphilis include neurological and cardiovascular complications. Gumma lesions may also develop on the skin or mucous membranes.

Syphilis is easy to cure, especially when diagnosed and treated in its early stages (within the first year). Secondary and tertiary stages can also be cured, however

damage that has already occurred may not be reversed. All stages of syphilis are treated with penicillin.

Neurosyphilis is an infection of the brain or spinal cord that can occur during any stage of syphilis. Some of the symptoms include weakness, difficulty walking, confusion, vision loss/issues and hearing problems. Further testing including a lumbar puncture is recommended as soon as possible to diagnose; thereby decreasing complications.

Congenital syphilis is caused by the syphilis bacterium passing from an infected mother to her infant during fetal development or birth. It is a severe, disabling and often life-threatening condition for the infant.

1. Reported Incidence

In 2018, 111 cases of primary (60 cases) and secondary syphilis (51 cases) were reported in Washoe County for an incidence of 24.2 cases per 100,000 population, a 90% increase compared to the 2017 data. Among females, the incidence rate was 9.2 cases per 100,000 population. The incidence was 40.0 cases per 100,000 population among males. The Healthy People 2020 national health objective is 1.3 new cases per 100,000 population among females and 6.7 new cases per 100,000 population among males. The reported incidence in Washoe County in 2017 was far higher than HP 2020 objectives.

Figure 3.1 Rate of Reported Cases of Primary and Secondary Syphilis, Washoe County, 2009– 2018.

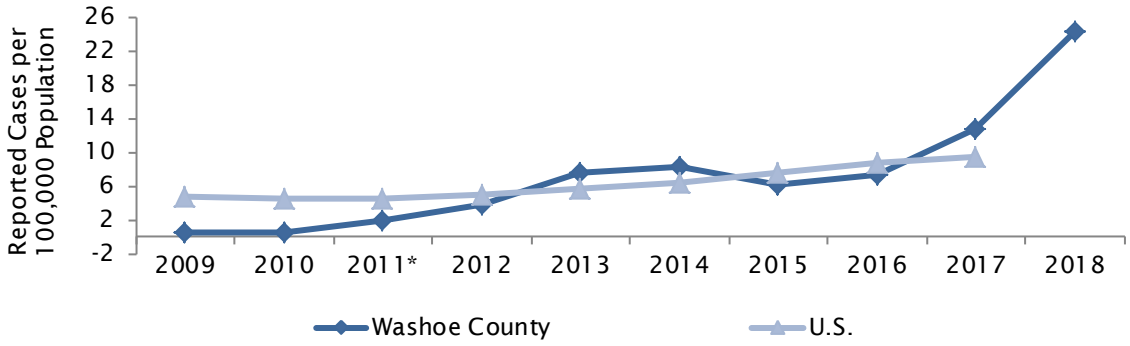


Table 3.1 Reported Cases of Syphilis, Washoe County, 2009 – 2018*.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Syphilis										
Primary	1	0	2	7	19	20	15	15	24	50
Secondary	1	2	6	9	14	16	12	18	33	60
Early Latent	2	4	3	5	12	16	26	33	40	63
Late Latent	21	10	12	15	26	25	31	30	39	64
Neuro*	0	1	5	2	1	1	0	1	3	0
Congenital	0	0	0	0	0	1	2	1	2	5
Total	**25**	**17**	**28**	**38**	**72**	**79**	**86**	**98**	**141**	**242**

*Neuro syphilis cases are also counted in the respective stage of their diagnosis (primary, secondary

2. Population Affected

Of the 111 cases of primary and secondary syphilis reported in 2018, 89 (80.2%) were males. Fifty eight (58) (52.2%) were White, non-Hispanic and thirty one (31) (27.9%) were Hispanic. The majority of primary and secondary stage cases, 65.4%, were under the age of 40 with a range of a 17– 39 years. Fifty-three (53) cases (47.7%) were also positive for HIV. Forty seven (47) cases (53.4%) were reported to be MSM (men who have sex with men) or bisexual. The incidence rate by gender in 2018 was far above HP 2020 Healthy People objectives.

Figure 3.2 Reported Cases of Primary and Secondary Syphilis by Age and Gender, Washoe County, 2018.

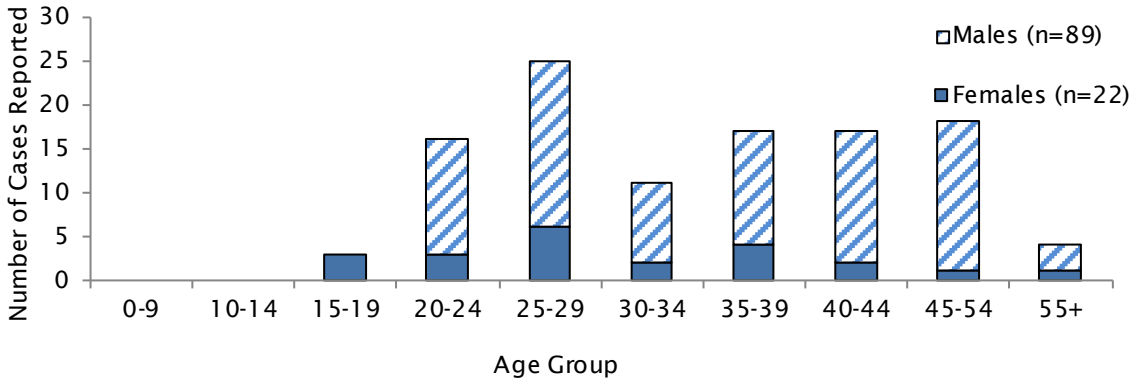


Figure 3.3 Reported Cases of Primary and Secondary Syphilis by Race/Ethnicity, Washoe County, 2018.

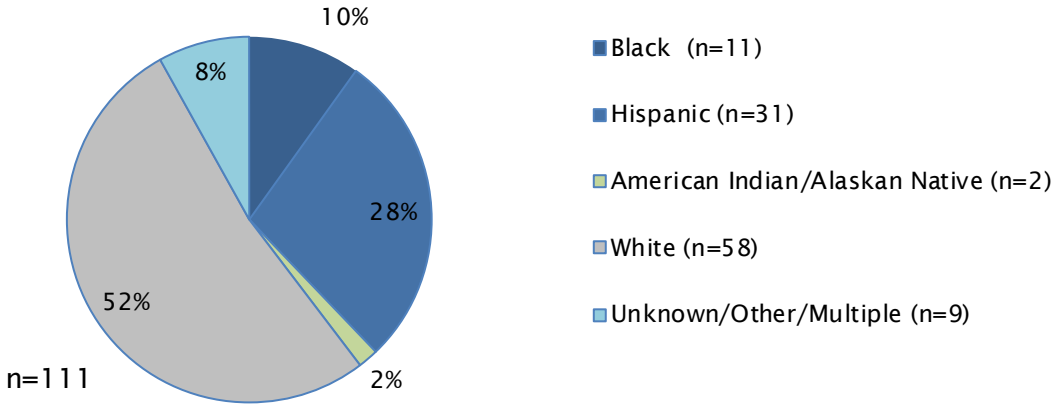
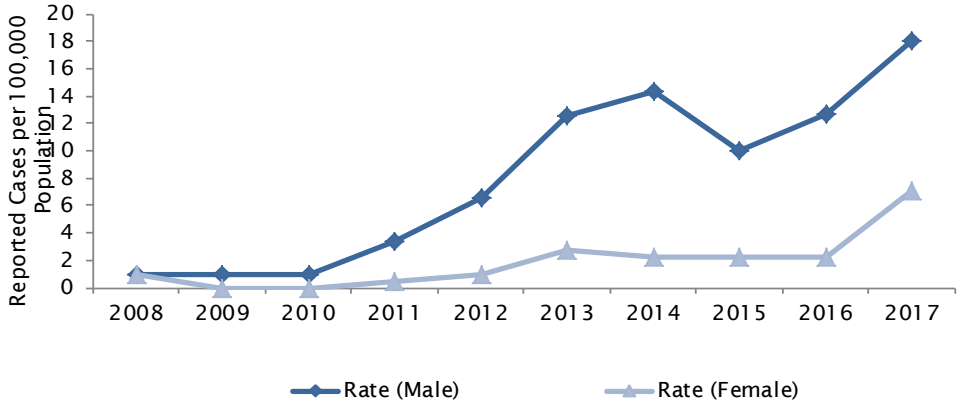


Figure 3.4 Rate of Reported Cases of Primary and Secondary Syphilis by Gender, Washoe County, 2009 – 2018.



Sixty one (61) cases of early latent syphilis were reported in 2018. Forty five (45) were males and fifteen (15) were female, and one was unknown gender. Twenty four (24) were White, non-Hispanic, twenty one (21) were Hispanic, four (4) were American Indian/Alaskan Native, seven (7) were Black and one (1) was unknown race.

Figure 3.4 Reported Early Latent Syphilis by Age and Gender, Washoe County, 2018.

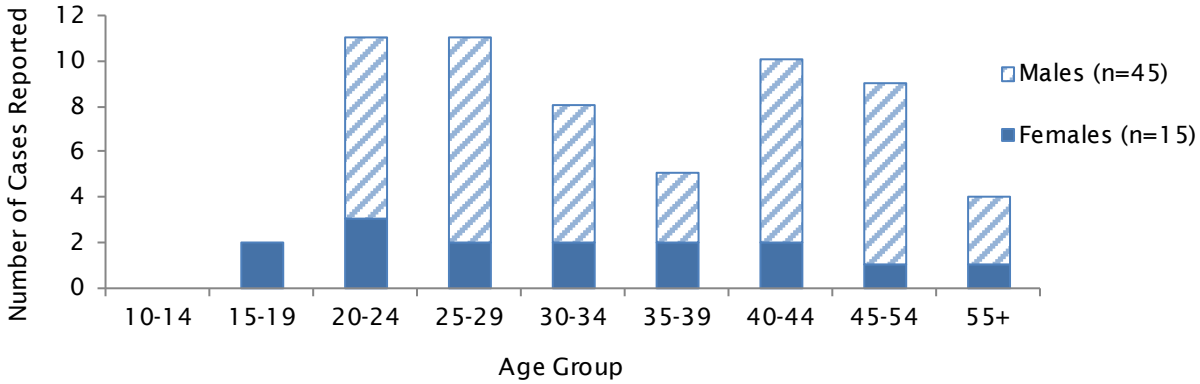
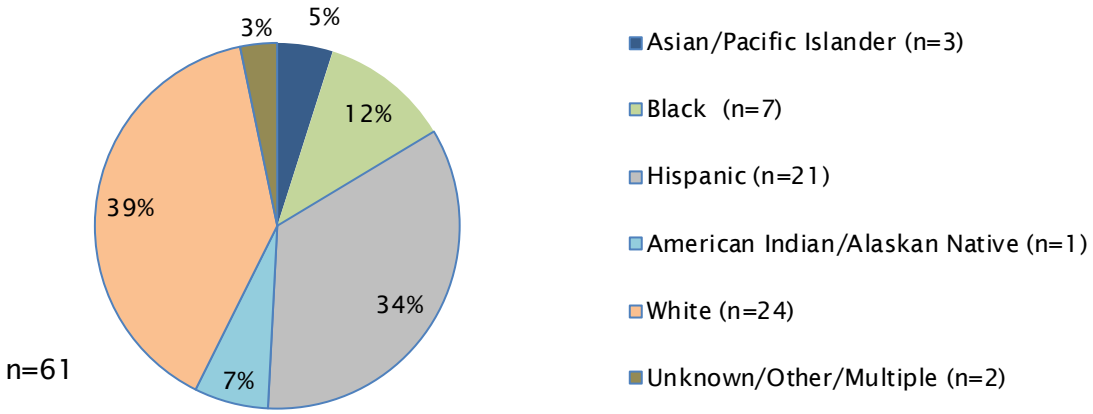


Figure 3.5 Reported Cases of Early Latent Syphilis by Race/Ethnicity, Washoe County, 2018.



Investigation of case clusters and other early syphilis cases was challenging due to transiency, anonymous partners, multiple partners and lack of cooperation from index cases. Advances in social media and networking have impacted traditional disease investigation methods as anonymity of the partner is easier to maintain, leaving little or no method or information to contact a partner.

IV. Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS)

A. Epidemiology

Infection with the Human Immunodeficiency Virus (HIV) leads to the development of Acquired Immune Deficiency Syndrome (AIDS). If HIV-infected persons contract an opportunistic infection, or their CD4+ T-lymphocyte count falls below 200 u/L, they meet the surveillance case definition for AIDS.

1. HIV Infection

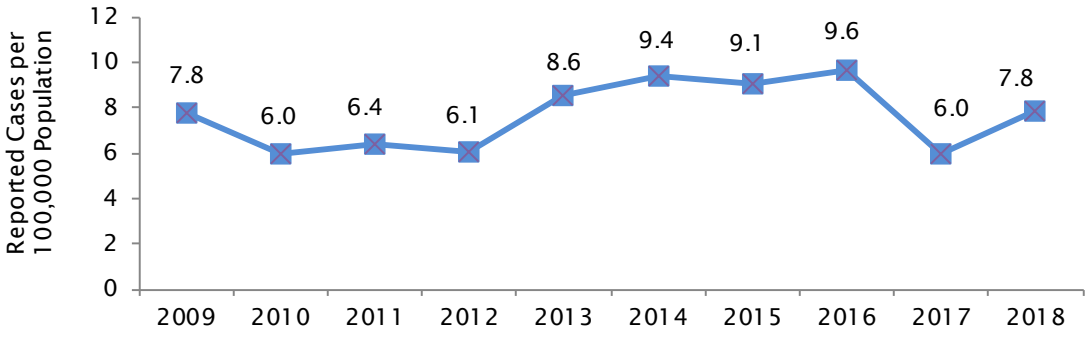
a. Reported Incidence

Since 1983, a total of 1,598 cases of HIV infection have been reported in Washoe County. This number represents an unduplicated count of all persons who have been reported as either: 1) a case of HIV infection without AIDS, or 2) a case of HIV infection with AIDS – depending on their health status at the time the HIV infection is first reported. The statistics presented in this report are based on these parameters for "HIV infection."

In 2018, 27 cases of HIV infection (without progression to AIDS) and 9 cases of HIV infection with progression to AIDS were reported in Washoe County. The total number of new cases of HIV infection for 2018 was 36 including HIV infections that progress to AIDS. The incidence of HIV infection in Washoe County was 7.8 cases per 100,000 population. The overall increased incidence of

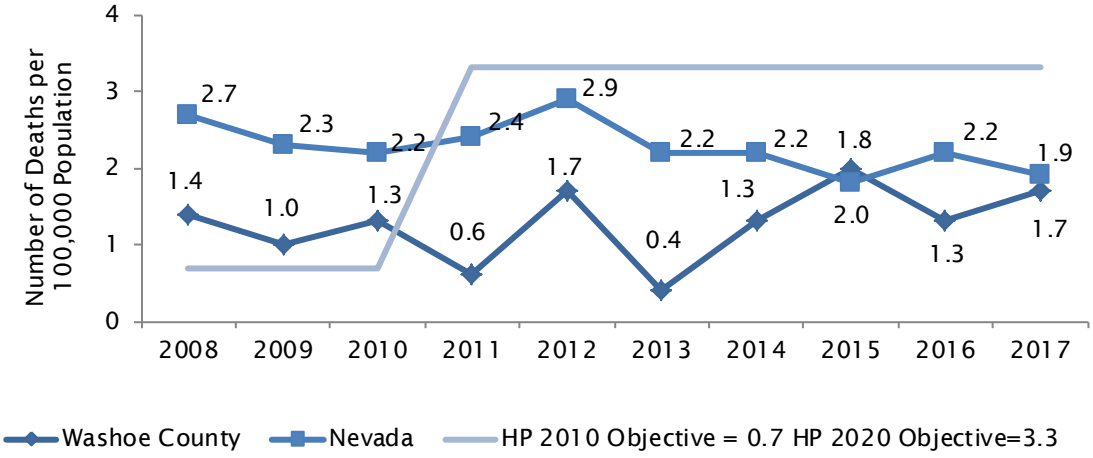
HIV in recent years may be associated with advances in social media and networking that has impacted traditional disease investigation methods as anonymity of the partner is easier to maintain, leaving little or no method to contact a partner. In 2017, the national incidence rate for HIV diagnoses was 11.8 cases per 100,000 population, which was the most current national data.

Figure 4.1 Rate of Reported Cases of HIV Infection, Washoe County, 2009-2018.



The Healthy People 2020 national health objective for deaths due to HIV infection is 3.3 deaths per 100,000 population. The age-adjusted death rate in Washoe County was 1.7 per 100,000 population in 2017, which met the HP 2020 objective.

Figure 4.2 Age-adjusted Death Rate Due to HIV Infection, Washoe County, 2008-2017.



Source: Nevada Division of Public and Behavioral Health (June 2017). This is the latest available data.

b. Population Affected

The HIV/AIDS epidemic nationally is growing most rapidly among minority populations. Although in 2018, the highest number of reported cases of HIV infection in Washoe County was in White persons; the number of reported cases among Blacks yielded rates that were significantly higher than that of Whites.

Figure 4.3 Reported Cases of HIV Infection by Age and Gender, Washoe County, 2018.

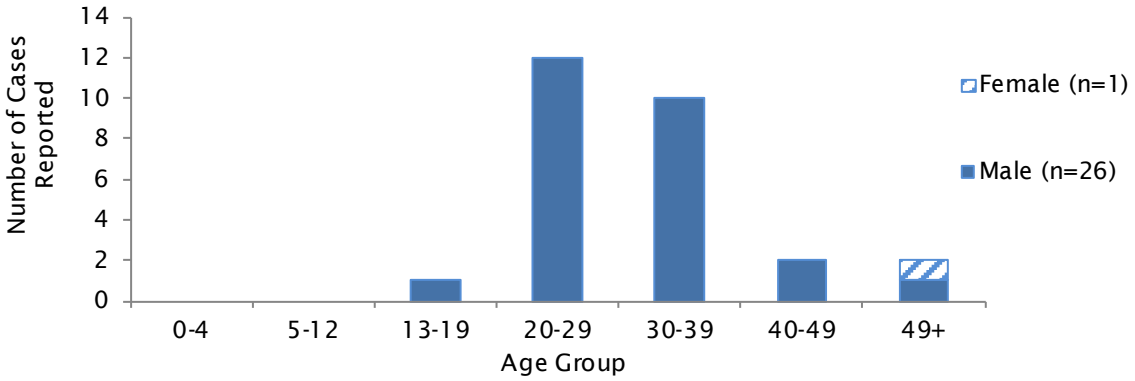


Figure 4.4 Reported Cases of HIV Infection by Race/Ethnicity, Washoe County, 2018.

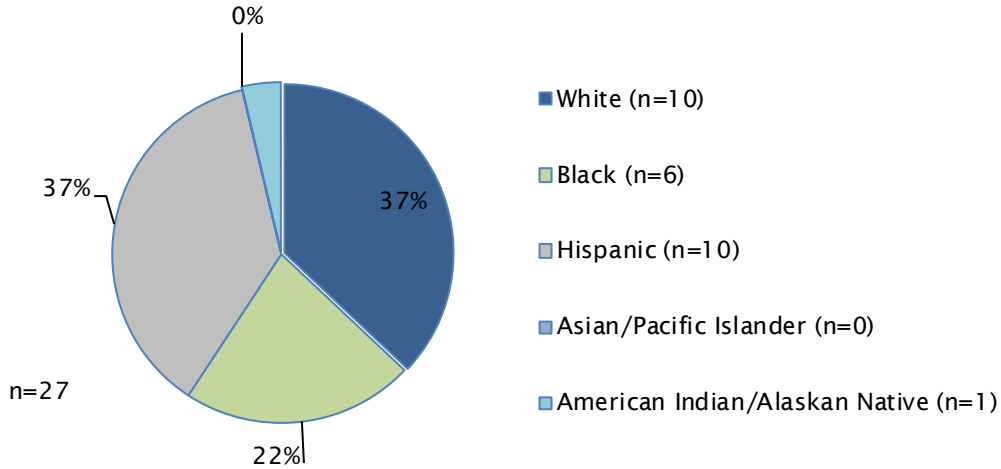


Figure 4.5 Rate of Reported Cases of HIV Infection by Race/Ethnicity, Washoe County, 2018.

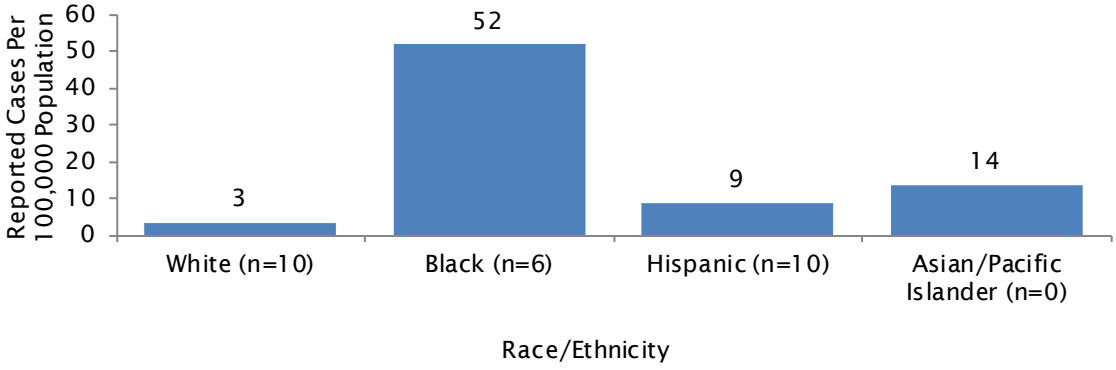


Figure 4.6 Reported Cases of HIV Infection by Age Group Represented as Percent of Total Cases, Washoe County, 2009-2018.

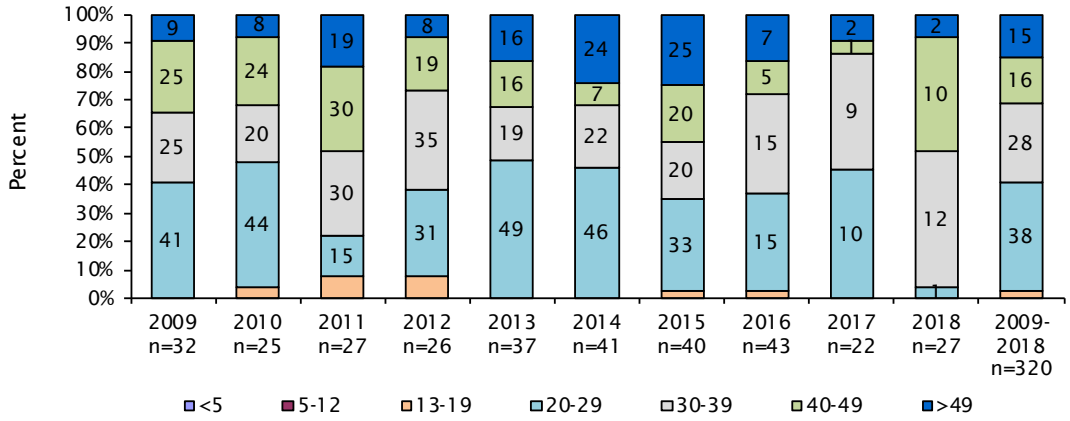
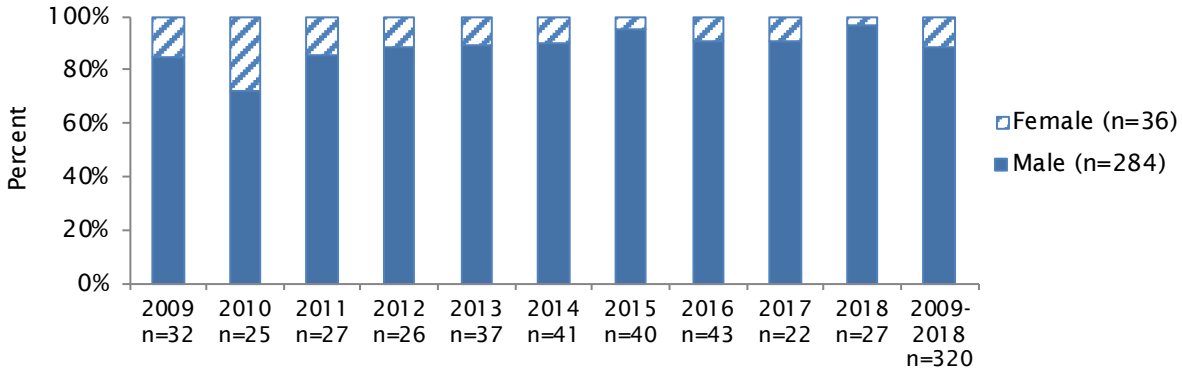
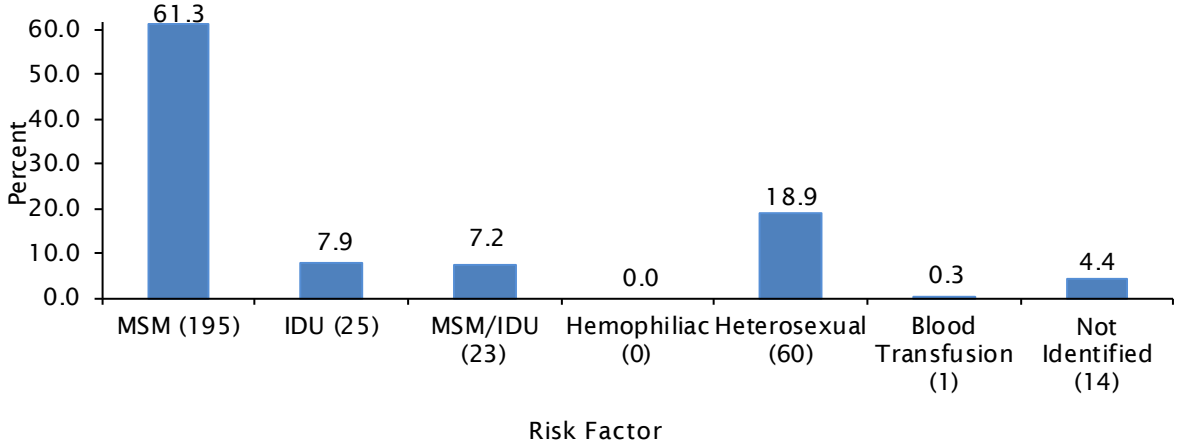


Figure 4.7 Reported Cases of HIV Infection by Gender Represented as Percent of Total Cases, Washoe County, 2009-2018.



The risk factors most commonly reported among those with HIV infection are: men who have sex with men (MSM), persons who report heterosexual contact only, and injection drug users (IDU), as well as a MSM/IDU. Non-identified risks refers to cases in which the risk factor is still being investigated or if the client's self-identified risk does not meet the definition allowed by federal guidelines.

Figure 4.8 Reported Cases of HIV Infection by Exposure Category Represented as Percent of Total Cases, Washoe County, 2009-2018.



2. Stage 3 HIV Infection (AIDS)

a. Reported Incidence

Since 1983, 1,059 cases of Stage 3 HIV infection (AIDS) have been reported in Washoe County. In 2018, 14 new cases of Stage 3 HIV infection were reported for an incidence of 3.0 cases per 100,000 population. A "new Stage 3 HIV infection case includes persons who were reported as a case of HIV infection during 2018 and had already progressed to Stage 3 infection (9 cases); or persons who were HIV infected in a year prior to progressing to Stage 3 infection diagnosis.

The Healthy People 2020 national health objective for Stage 3 HIV infection, traditionally called AIDS, is 13.0 new cases per 100,000 population among adolescents and adults. Effective in 2009, the national incidence of reported AIDS was not available, instead, only the incidence of HIV diagnosis was available.

Figure 4.9 Rate of Reported Cases of AIDS, Washoe County, 2009-2018.

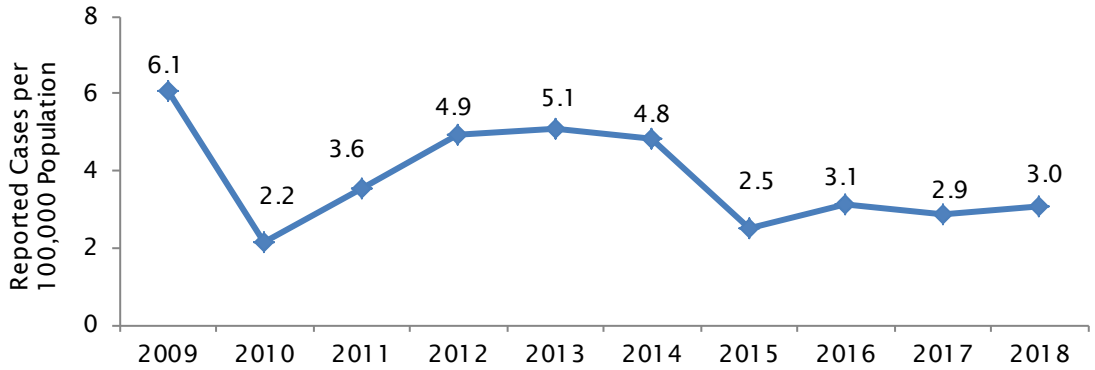
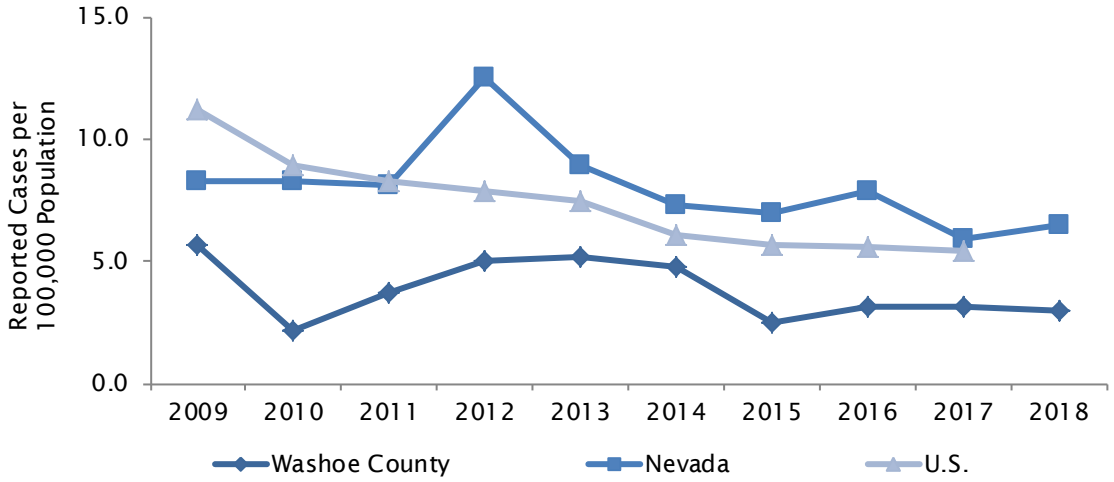


Figure 4.10 Rate of Reported Cases of AIDS, Washoe County, Nevada and U.S., 2009-2018.



b. Population Affected

In Washoe County, the highest number of reported Stage 3 HIV cases was among White persons in 2018, yet when adjusted for population, the rate is higher among Blacks. The majority of cases were reported in males. The 20-29 age group reported the majority of Stage 3 infections, indicating that people acquired HIV when they were a teenager or young adult. The risk category representing most infections was among men who have sex with men (MSM).

Figure 4.11 Reported Cases of AIDS by Age and Gender, Washoe County, 2018.

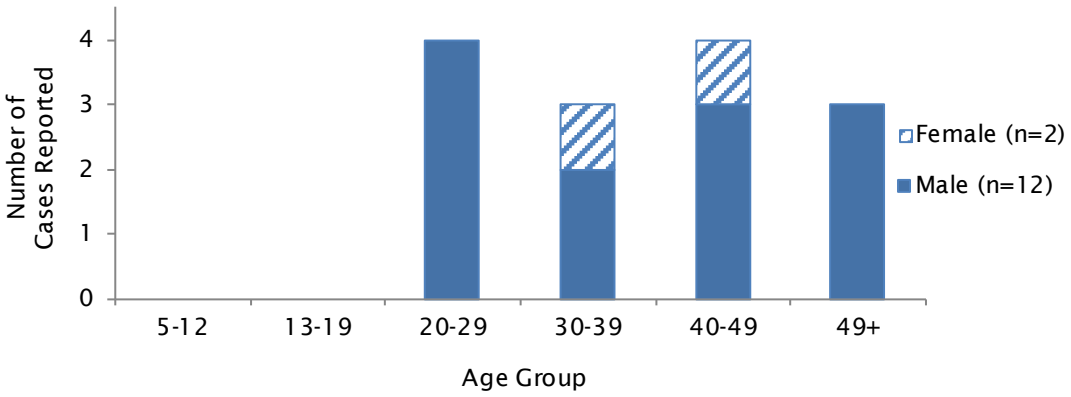


Figure 4.12 Reported Cases of AIDS by Race/Ethnicity, Washoe County, 2018.

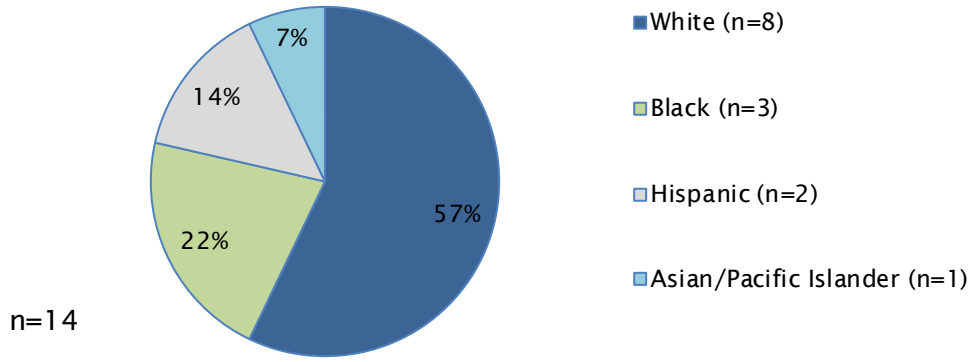


Figure 4.13 Rate of Reported Cases of AIDS by Race/Ethnicity, Washoe County, 2018.

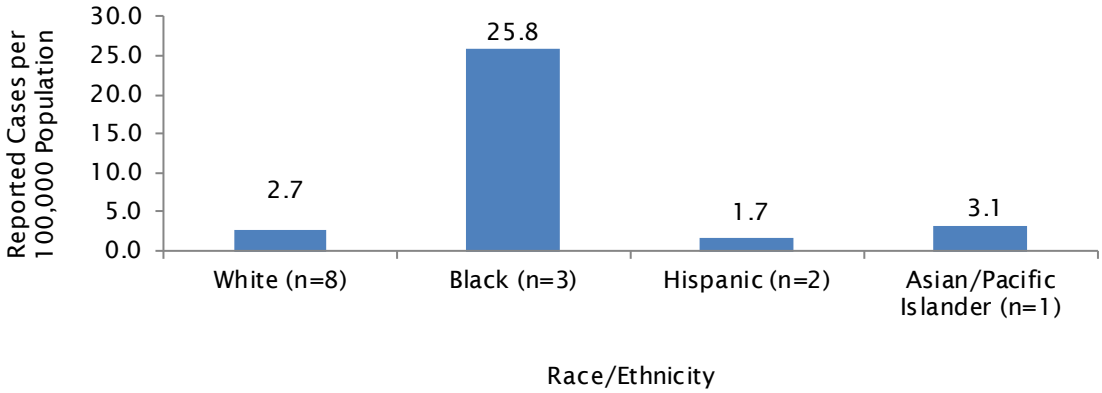


Figure 4.14 Reported Cases of AIDS by Age Group Represented as Percent of Total Cases, Washoe County, 2009-2018.

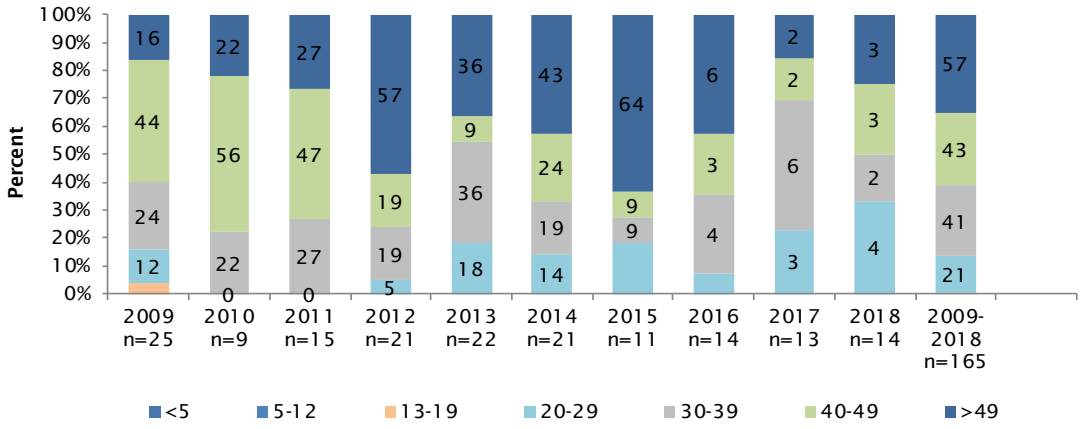


Figure 4.15 Reported Cases of AIDS by Gender Represented as Percent of Total Cases, Washoe County, 2009-2018.

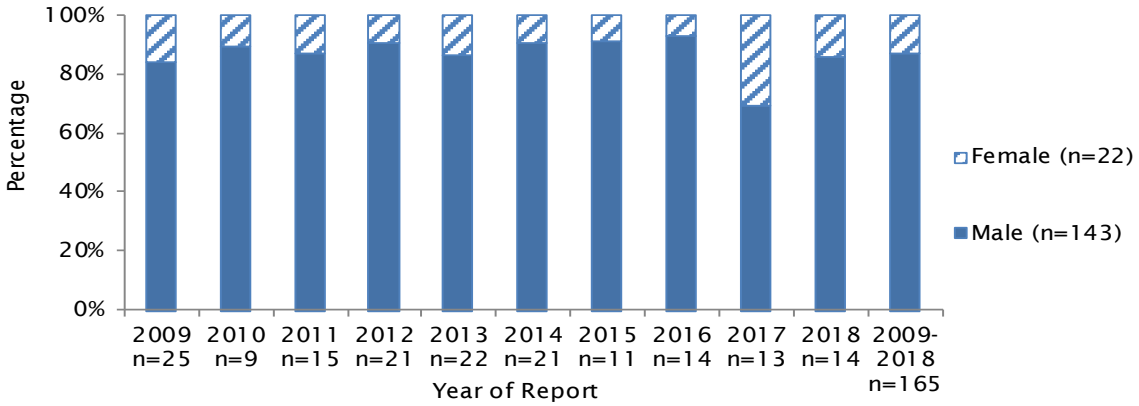
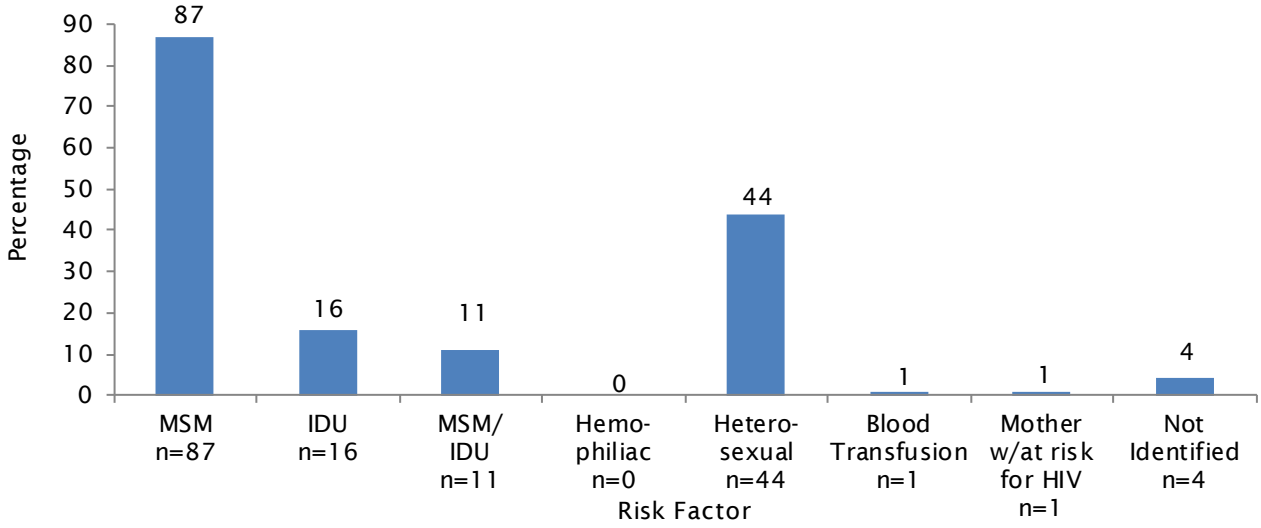


Figure 4.16 Reported Cases of AIDS by Exposure Category Represented as Percent of Total Cases, Washoe County, 2009-2018.



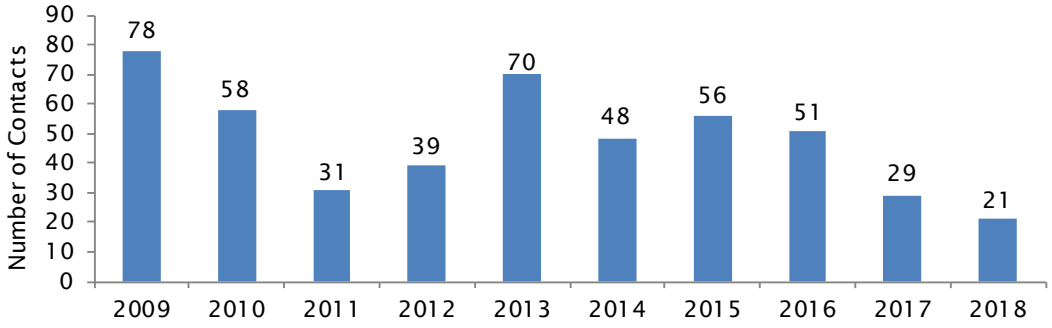
B. Prevention and Control

The Disease Intervention Specialists interviewed cases of HIV infection and AIDS to identify sexual and percutaneous contacts for testing and treatment intervention. Of the 35 HIV and AIDS cases reported, a total of 21 contacts were identified. The following table shows the results of these investigations.

Table 4.1 Contacts to HIV/AIDS Cases, HIV Test Results, Washoe County, 2018.

Contacts Identified in 2018	Total	Cumulative %
Negative Result Male	5	24%
Positive Result Male	5	24%
Not yet tested/Investigation ongoing/Refused testing M	2	10%
Male Contacts who are **already** HIV positive	4	19%
Total Male	**16**	**76%**
Negative Result Female	5	24%
Positive Result Female	0	0%
Not yet tested/Investigation ongoing/Refused testing F	0	0%
Female Contacts who are **already** HIV positive	0	0%
Total Female	**5**	**24%**
Total Contacts who refused Testing/Unable to loc	**2**	**10%**
Total Contacts who were Positive, newly diagnose	**2**	**10%**
Total Contacts	**21**	**100%**

Figure 4.17 Number of Contacts to HIV/AIDS Cases Identified, Washoe County, 2009-2018.



The WCHD offers confidential HIV counseling and testing in its clinics and at various sites in the community. Of the 2,157 tests provided in 2018 by WCHD, five (5) were positive for a positivity rate of 0.23%. Between 1998 and 2017, the overall rate of positive HIV tests performed by WCHD has been less than 1%, at 0.5% (281/55,244).

In 2003, WCHD adopted the Centers for Disease Control and Prevention (CDC) recommendations for HIV testing in low prevalence settings (i.e., settings with a <1% HIV positivity rate). As a result, the WCHD moved from universal HIV testing (testing all those who request it) to targeted testing (testing those individuals who meet a predetermined set of risk criteria). Beginning in 2005 and continuing to the present, an internal workgroup of WCHD, as well as a community testing task force, reviews positivity data, risk factors per testing site, and funding/resource availability to evaluate the efficacy of testing individuals identified to be at greatest risk of HIV infection. Direction from the National HIV/AIDS Strategy as well as emphasis on High Impact HIV prevention activities further directs testing efforts. Testing locations and targeted populations change based on the groups' recommendations. In 2018, populations that were targeted for HIV testing include:

- Men who have sex with men;

- Injection drug users;
- Partners of men who have sex with men;
- Partners of injection drug users;
- Those who present with an opportunistic infection;
- Contacts of HIV positive individuals;
- Sexual assault victims;
- Clients with a confirmed, concurrent STD;
- Pregnant women; and
- Those who specifically ask for an HIV test.

Clinicians exercise their professional judgment and recommend an HIV test for individuals in the ineligible categories, if the presence of other risk behaviors suggests an increased risk for HIV.

Figure 4.19 HIV Positivity Rates, WCHD HIV Testing, Washoe County, 2009-2018.

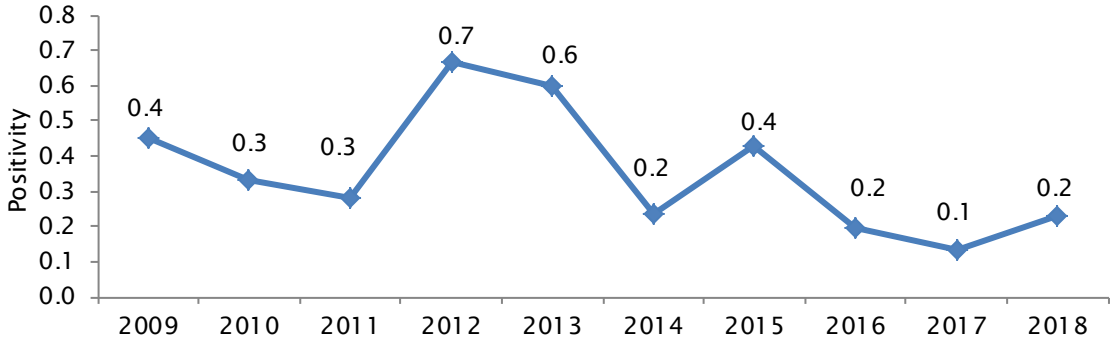


Figure 4.19 shows the overall reduction in HIV positivity in the targeted screened population from 2009 through 2018. This result is likely associated with the implementation of evidence-based interventions in the community beginning in 2002 and continuing through 2015. From 2002 through 2015, WCHD provided oversight of evidence-based prevention interventions in the community. In 2016, the focus moved from behavioral interventions to testing of specific target populations, established by the Northern Nevada HIV Prevention Planning Group with direction from CDC. Identifying people living with HIV (PLWH) through testing, linking PLWH and retaining them in HIV care is the current strategy. Advances in social media and networking have impacted traditional disease investigation methods. Anonymity of the partner is easier to maintain, leaving little or no method and information to contact a partner. Additionally, other community providers have increased their capacity to provide HIV tests. Cumulatively, these have had an impact on WCHD's HIV testing

Diagnostic methods maintained the same sensitivity and specificity during the same time period.

Table 4.2 demonstrates the results of HIV tests stratified by the type of testing site. Sites include the WCHD Sexual Health Clinic, TB and family planning clinics, jail and juvenile detention, and community-based testing provided by WCHD. These data do not include test results from Northern Nevada HOPES, a federally qualified health center that provides a significant number of HIV tests, or private medical providers in Washoe County. Therefore the rates in Table 4.2 are not applicable to the results of all HIV tests performed in Washoe County.

Table 4.2 Results of HIV Tests by WCHD Testing Site, Washoe County, 2018.

Site Type	No. Tested	No. Positive	Positivity (%)
STD	1,014	3	0.30
TB	3	0	0.00
Prison/Jail	509	0	0.00
Family Planning	27	0	0.00
Other*	604	2	0.33
Total	**2,157**	**5**	**0.23**

*Other sites refer to community based (offsite) testing provided by WCHD, i.e., routine offsite testing sites, special events, and other outreach events.

TUBERCULOSIS

I. Epidemiology

A. Tuberculosis

1. Reported Incidence

Nine (9) cases of tuberculosis (TB) were reported in Washoe County in 2018 for an incidence rate of 2.0 cases per 100,000 population. This decrease represents the variability of TB cases from year to year. The average number of cases in Washoe County over the past 10 years has been ten (10) cases. The national incidence of TB in 2018 was 2.8 cases per 100,000 population, representing a 1.3% decrease from 2017. The Healthy People 2020 national health objective for the annual incidence of TB is 1 new case per 100,000 population. The National TB Program Objectives and Performance Targets for 2020 are:

- less than 0.4 cases per 100,000 of US born persons (1.0 US rate in 2018),
- less than 1.5 cases per 100,000 for US born non-Hispanic blacks (2.6 US rate in 2018),
- less than 11.1 cases per 100,000 for foreign born persons (14.2 US rate in 2018).

These objectives cannot be applied to local data as the specific denominators are not available at the local level.

Figure 1.1 Rates of Reported Cases of TB, Washoe County, 2009-2018.

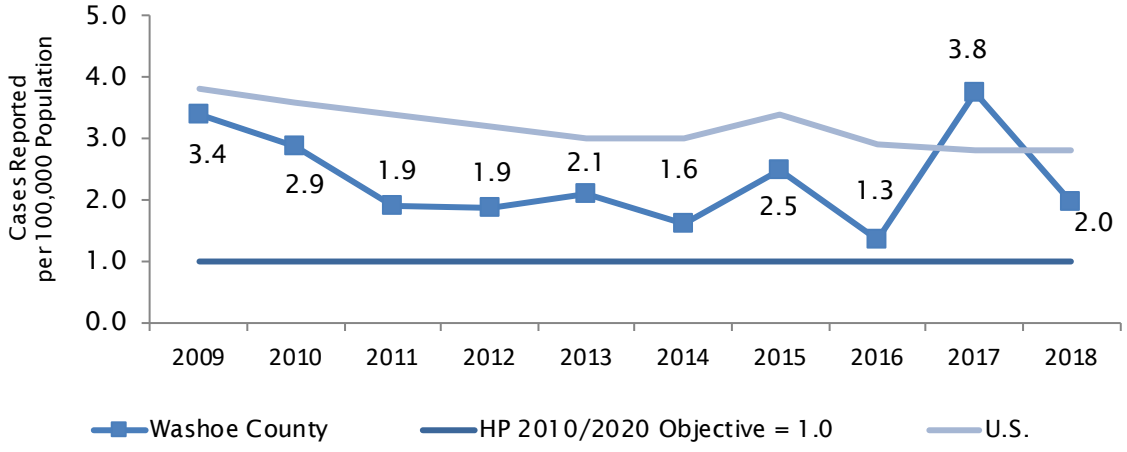
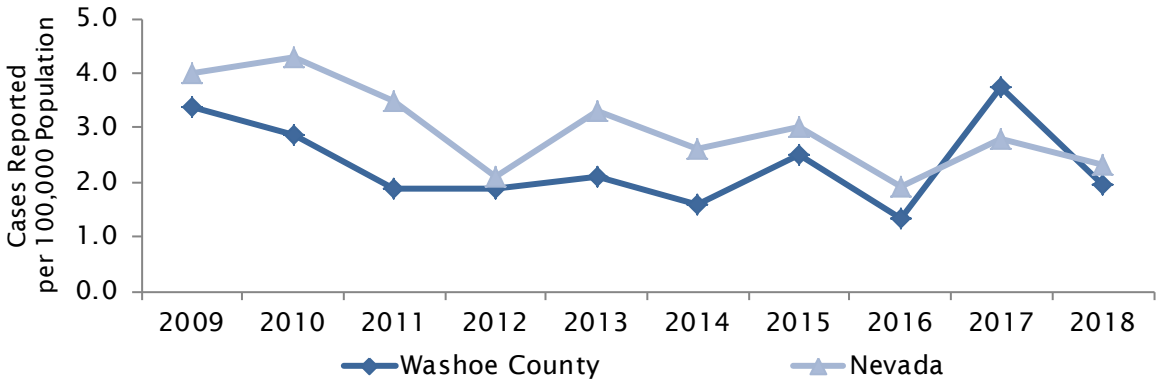


Figure 1.2 Rates of Reported Cases of TB by Year, Nevada, 2009-2018



2. Population Affected

In 2018, Washoe County treated six (6) males and three (3) females for active TB. The median age of male cases was 48 years (range: 2 years – 71 years); the median age of female cases was 45 (range 31 years – 78 years).

Figure 1.3 Reported Cases of TB by Age and Gender, Washoe County, 2018

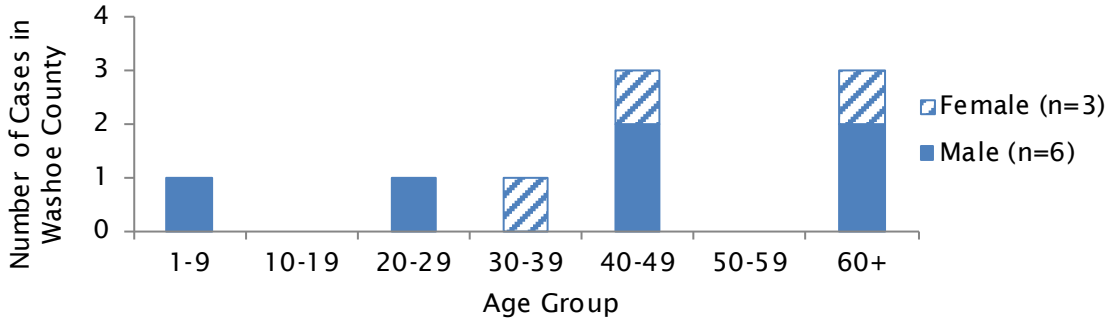


Figure 1.4 Reported Cases of TB by Gender, Washoe County, 2009-2018

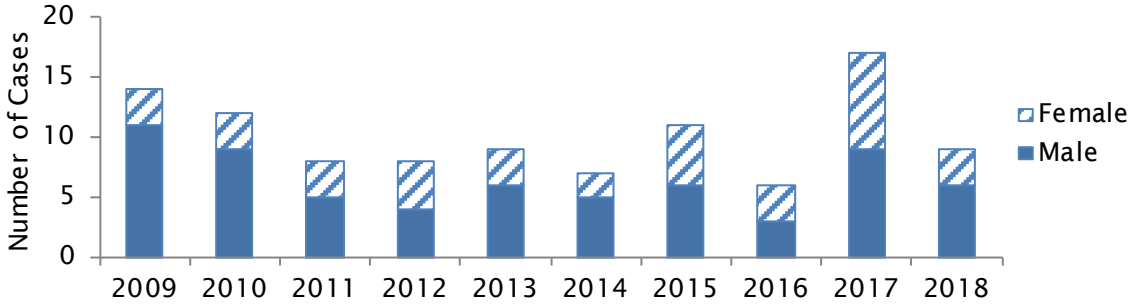
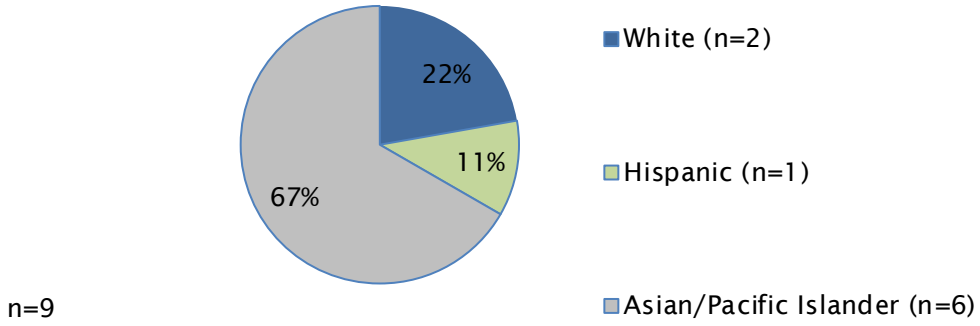


Figure 1.5 Reported Cases of TB by Race/Ethnicity, Washoe County, 2018



In 2018, six (67%) of the reported TB cases in Washoe County were born in foreign countries where TB is endemic.

Figure 1.6 Proportions of Reported Cases of TB by Birth Country, Washoe County, 2018

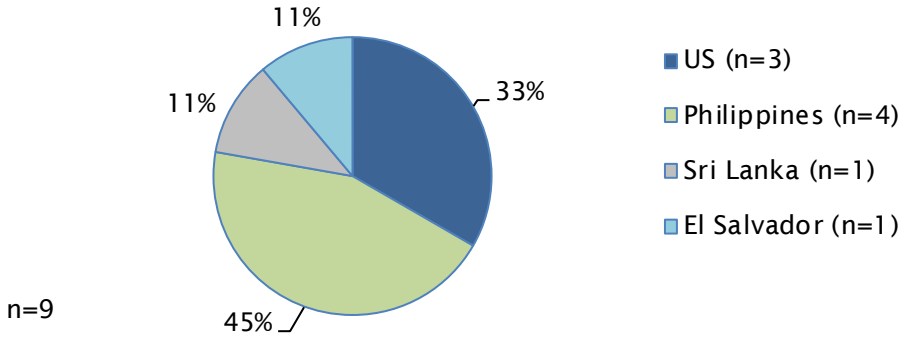
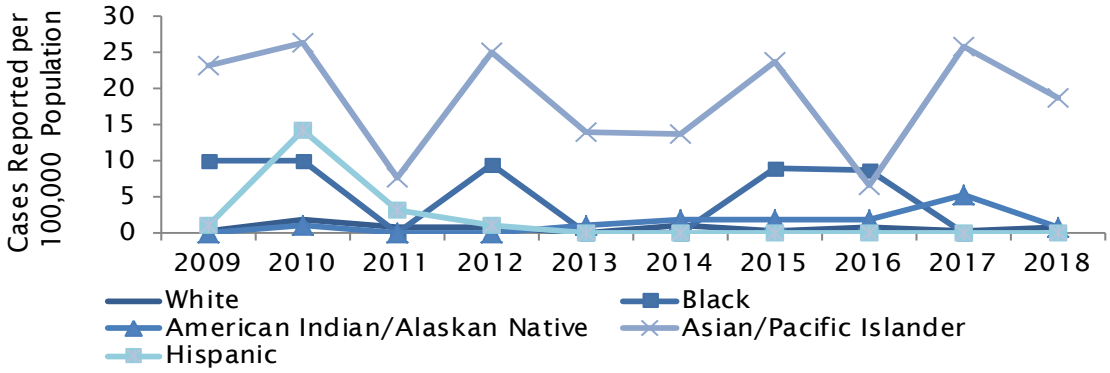


Figure 1.7 Rates of Reported Cases of TB by Race/Ethnicity, Washoe County, 2009-2018



3. Drug Resistant TB

No cases of multi-drug resistant TB (MDR-TB) were reported or treated in Washoe County in 2018. There was no resistance of any type noted for 2018 cases.

4. TB and HIV Co- infection

All cases of TB diagnosed in Washoe County for 2018 were screened for HIV. There were no cases co-infected with HIV.

B. Latent Tuberculosis Infection (LTBI)

1. Estimated Prevalence

In 2019, it is anticipated that a State law will be passed that will require providers to report all persons who test positive for tuberculosis infection. Additionally, the National Tuberculosis Controller's Association and Society for Epidemiology in Tuberculosis in connection with the Center for Disease Control and Prevention are studying the feasibility of mandatory national reporting.

The definition of "latent tuberculosis infection" is infection with *Mycobacterium tuberculosis*, without any disease process due to the infection. It is not possible to determine exactly how many persons become infected with *M. tuberculosis* each year. However, based on the population and the average number of active TB cases over the past 5 years, it can be estimated that there are 13,000 – 21,000 persons living with LTBI in Washoe County. A new law passed in September 2015 that requires healthcare providers to report any child under the age of five (5) years that tests positive to any TB infection test.

There were no children under 5 years of age diagnosed with LTBI in 2018.

In 2018, the Washoe County Tuberculosis Program received 460 reports that included; positive blood and skin testing for TB, diagnoses of Latent TB infection, and suspect cases for active TB disease. There were also 180 positive acid fast bacilli (AFB) reports received that were evaluated for TB disease.

2. Population Affected

The Washoe County Health District (WCHD) Tuberculosis Prevention and Control Program (TBPCP) tests Washoe County residents at highest risk for TB infection, including close contacts to TB cases, new immigrants and foreign-born persons from countries where TB is endemic. The TBPCP partners with the homeless shelters for evaluation of shelter residents who present with TB symptoms, and is actively educating primary care providers to be alert for suspect cases of TB. The TBPCP encourages and educates primary care providers in the treatment of their patients for TB and LTBI.

In 2018, a total of 174 people were evaluated by the WCHD TBPCP for TB infection. Of these, 119 were evaluated with one or more of the following tests: QuantiFERON-TB Gold (QFT), QuantiFERON-TB Gold Plus (QFT-Plus), T-SPOT, or Tuberculin Skin

Test (TST). A total of 161 of these tests were completed in 2018. The total number of individuals positive with TST, QFT, QFT-Plus or T-SPOT was 62. There were 103 phone consultations to medical providers and others in 2018, along with many email communications to providers that are difficult to track.

Table 1.1 Tuberculosis Screening Tests (TST and QFT), TBPCP, 2009-2018

Year	Total # of Persons Tested	# Positive	Percent Positive
2009	235	134	57.0
2010	215	184	85.6
2011	116	70	60.3
2012	151	88	58.3
2013	271	106	39.1
2014	133	73	54.9
2015	141	77	54.6
2016	86	34	39.5
2017	177	30	16.9
2018	174	62	35.6

II. Prevention and Control

A. Tuberculosis

1. Cases

Sixteen (16) cases of TB were treated by the TBPCP in 2018. These included the nine (9) cases reported in 2018 and seven (7) cases reported in 2017 that completed their treatment in 2018.

Of the nine (9) cases of TB diagnosed in 2018, seven (7) have completed a full course of curative treatment and two (2) remain on treatment in Washoe County with anticipated completion dates in 2019.

Of the seventeen (17) cases diagnosed with TB in Washoe County in 2017, sixteen (16) completed a full course of curative treatment within 12 months. One case died prior to treatment.

The Healthy People 2020 national health objective for completing a course of curative treatment for TB within 12 months is 93%. WCHD TB Program met this goal for 2017. 100% of cases completed the treatment.

2. Contacts

When a person with TB is identified, a case contact investigation is initiated to identify individuals who may have become infected through close and prolonged association with the person sick with TB. Contacts are counted in the same year the index case is reported, regardless of when the contact is actually tested or

evaluated. Example: Contacts of an index case reported in 2018 but not tested until 2019 are counted with 2018 data.

In 2018, the TBPCP conducted contact investigations for five (5) cases of TB disease, and one source case investigation for a pediatric case of meningeal/pulmonary TB.

There were two hundred-nine (209) contacts to **smear and culture positive** cases identified, one hundred-twelve (112) completed an evaluation for TB infection utilizing either TST, QFT, QFT-Plus, or T-SPOT. Many contacts with residence in a shelter were not found. Four (4) of these 112 contacts tested positive, one (1) was diagnosed with pulmonary TB (PTB) and completed treatment, one (1) was lost to follow up, and two (2) were prior positives already treated for latent TB infection.

There were six (6) contacts to a single **smear negative and culture positive** case identified. All of the contacts were family members evaluated with T-SPOT, TST and/or chest x-ray (CXR). Five (5) (children to index) tested negative, and one (1) (spouse) had borderline T-SPOT testing with a negative CXR. Spouse was offered LTBI treatment, but refused.

There was one (1) **associated** contact to our **smear negative and culture negative** [positive by Nucleic Acid Amplification Test (NAAT) only] case of 2018. This contact was also diagnosed with PTB. These cases were roommates; however they could not be linked through genotyping.

There were five (5) contacts to one of our **smear positive, culture positive, extrapulmonary** cases in 2018. Four (4) household contacts were identified and evaluated. Two (2) were prior positive LTBI cases that had already been treated, and two (2) were negative.

The other **smear positive, culture positive, extrapulmonary** diagnosis for 2018 was a pediatric meningeal TB case.* A source case investigation revealed 4 potential household sources. Three (3) tested negative, and one (1) tested positive. This case was diagnosed as LTBI and is currently receiving treatment.

**Source for this case was diagnosed with PTB in 2019. This source had not been identified in the initial source case investigation. Genotypes were a rare identical strain. Further investigation established contact between the two.*

There were three (3) extra-pulmonary cases of TB in 2018. Contact investigations are not done for these cases.

Table 2.1 Evaluated Contacts to TB Cases, Washoe County 2009-2018

Year	# of Contacts Tested	# Positive	% Positive	# Diagnosed with TB	% Diagnosed with TB
2009	214	59	28	0	0.0
2010	151	42	28	3	2.0
2011	54	14	26	0	0.0
2012	178	18	10	1	0.6
2013	365	18	5	1	0.3
2014	35	5	14	0	0.0
2015	56	4	7	0	0.0
2016	14	4	29	1	7.1
2017	93	19	20	0	0.0
2018	227	9	4	1	0.4

B. Latent Tuberculosis Infection (LTBI)

1. Treatment of LTBI

Persons with LTBI infection have a 10% risk of developing active TB disease during their lifetime. The risk is greatest within two years after infection occurs. Persons with certain medical conditions (e.g. diabetes, HIV infection, treatment with tumor necrosis factor (TNF) alpha inhibitors, organ transplants, silicosis, 10% below ideal body weight, hemodialysis patients, etc.) are at an increased risk of developing active TB during their lifetime. Additionally, infants and children under 5years of age have an increased risk of developing TB disease. Treating LTBI infection can significantly reduce a person's risk of ever developing TB disease.

The Healthy People 2020 national objectives for LTBI therapy are:

1) For individuals diagnosed with latent TB infection (LTBI) who are contacts to sputum AFB smear-positive TB cases, increase the proportion that start treatment to 91%. One of two persons meeting these criteria (50%) started treatment in Washoe County for 2018. Two (2) contacts were prior LTBI cases that had already completed treatment.

2) For individuals diagnosed with LTBI who are contacts to sputum AFB smear-positive TB cases and who have started treatment for LTBI, increase the proportion that complete treatment to 81%. One person started treatment in 2017 and completed treatment in 2018 (100%).

3) For immigrants diagnosed with LTBI who had an abnormal chest x ray read overseas and for whom treatment is recommended, increase the proportion that start treatment to 93%. Eight (8) of thirteen (13) immigrants started treatment (62%).

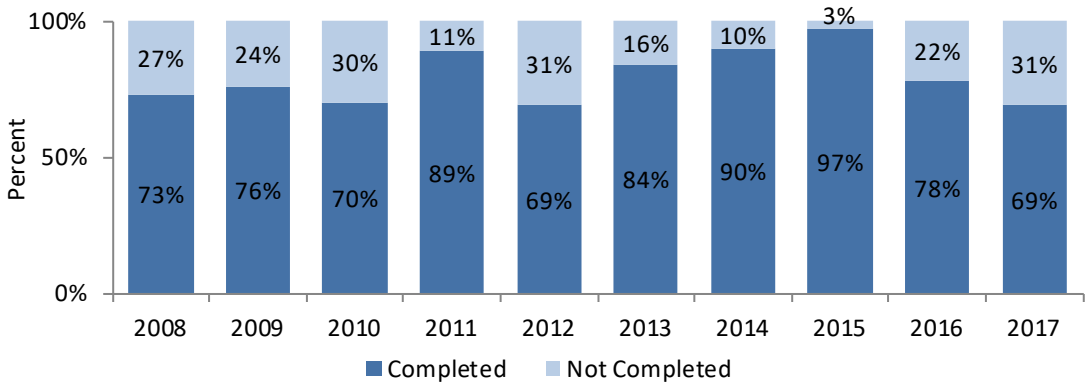
4) And for those immigrants who start treatment increase the proportion that complete treatment to 83%. Eight (8) of eight (8) immigrants who started treatment, thus far, have completed treatment (100%). Of the four (4) immigrants who started treatment late in 2017, all have now completed treatment in 2018 (100%).

An estimated total of twenty six (26) LTBI diagnoses, ten (10) of which were immigrants, started treatment for LTBI in 2017 and completed an adequate course. Seven (7) people were lost to follow up, two (2) moved out of jurisdiction, one (1)

had medication intolerance, one (1) refused treatment, and two (2) died prior to initiating treatment.

The overall completion rate for treatment of LTBI among all persons who started treatment in 2017 was 27 out of 39 (69%).

Figure 2.1 Completion Rate for Treatment of LTBI, TBPCP, 2008-2017*



*2018 completion rate data will be available in the 2019 annual report.

VACCINE PREVENTABLE DISEASES

In 2018, an assessment of vaccination coverage showed that 75.8% of children aged 19-35 months had received age-appropriate vaccinations at the time of their visiting clinics or healthcare providers located in Washoe County (Data source: Nevada Division of Public and Behavioral Health, March 2019)[1]. This is higher than the 2017 national coverage at 70.4% . The Healthy People 2020 national health objective for vaccine coverage among children aged 19-35 months is 80%. The vaccines include: DTaP (4 doses), polio (3 doses), MMR (1 dose), Hib (3 doses), hepatitis B (3 doses), varicella (1 dose), and PCV (4 doses). These are highly effective vaccines against diphtheria, tetanus, pertussis, polio, measles, mumps, rubella, *Haemophilus influenzae* type b (Hib) disease, hepatitis B, chickenpox, and invasive pneumococcal disease.

The WCHD works closely with the Washoe County School District, Immunize Nevada - Nevada's statewide immunization coalition, private health care providers and child care providers to raise immunization rates and reduce vaccine-preventable diseases. There are highly effective vaccines against the previously described diseases as well as influenza and rotavirus.

Vaccination against these diseases has reduced reported cases to record-low levels. No cases of diphtheria, polio, or rubella have been reported in Washoe County in the last decade. Sporadic cases of mumps are occasionally reported. One case of tetanus was reported in 2017 and one-case of measles was reported in 2018.

Table A Summary of Laboratory-Confirmed Cases of Vaccine Preventable Diseases (VPD), Washoe County, 2009 – 2018*

VPD	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Diphtheria	0	0	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0	0	1
Mumps	0	2	1	1	3	4	2	3	2	0
Polio	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0
Tetanus	1	0	0	0	0	0	0	0	1	0

*Varicella is not a reportable disease in Nevada.

The WCHD and the Vaccines For Children (VFC) providers administer the vast majority of childhood vaccines in Washoe County.

[1] The correct coverage rate for previous years should be 75.9% (2014), 74.5% (2013), 73.6% (2012), 71.2% (2011) (Data source: Nevada Division of Public and Behavioral Health, April 2015)

Table B Vaccine-Specific Doses Administered, Washoe County, 2018.

Vaccine	WCHD	VFC Providers	All Other Providers	Total
DTaP, DT	190	4,341	1,175	5,706
DTaP-HepB-IPV	303	7,370	2,576	10,249
DTaP-IPV/Hib	192	5,578	18	5,788
DTaP-IPV	348	4,114	981	5,443
Td,Tdap	896	15,628	15,819	32,343
IPV	220	1,119	145	1,484
MMR	891	3,515	1,949	6,355
MMRV	0	8,040	997	9,037
Varicella	1,023	3,306	1,592	5,921
Total	4,063	53,011	25,252	82,326

I. Invasive *Haemophilus influenzae* type b (Hib)

A. Epidemiology

Since the licensure of conjugate Hib vaccines for children in 1987, and for infants in 1990, rates of invasive Hib disease among children < 5 years of age have declined by more than 95% in the United States. Rates for adults have remained stable.

1. Reported Incidence

Six (6) laboratory-confirmed cases of invasive Hib disease were reported in Washoe County in 2018. No single case was reported between 2008 and 2017. The 2017 national incidence rate for children was 0.19 cases per 100,000 population among children less than 5 year of age, which was the most current national data. The Healthy People 2020 national health objective is 0.27 cases per 100,000 population in children < 5 years of age.

2. Population Affected

Six (6) laboratory-confirmed cases of invasive Hib disease were reported in Washoe County in 2018. The median age was 71.5 years old (Range: 20 years and 91 years). Four cases (4) were female, four (4) were White, non-Hispanic, one (1) Asian and one (1) Hispanic. No death was reported.

Three (3) cases of invasive *Haemophilus influenzae*, non type b, were reported in 2018. The median age was 69 years old (Range: 52 years and 91 years). Four cases (4) were male, three (3) were White, non-Hispanic, one (1) Black and one (1) Hispanic. No death was reported.

B. Prevention and Control

Haemophilus influenzae type b (Hib) vaccine is an inactivated vaccine indicated for active vaccination against Haemophilus influenzae type b. There are three monovalent conjugate Hib vaccines, ActHib® (PRP-T), Hibrix® (PRP-T), and PedvaxHib® (PRP-OMP) and one combination conjugate Hib vaccines Pentacel® (DTaP-IPV/Hib) licensed for use in the United States.

The routine recommendations for the Hib vaccines include the following:

ActHib® (PRP-T) (Initial U.S. Approval: 1993) and Hibrix® (PRP-T) (Initial U.S. Approval: 2009)

- Children 6 weeks-4 years of age
- 4 dose series
- Administered at 2, 4, 6, and 12-15 months of age

PedvaxHib® (PRP-OMP) (Initial U.S. Approval: 1989)

- Children 6 weeks-4 years of age
- 3 dose series
- Administered at 2, 4, and 12-15 months of age

Pentacel® (DTaP-IPV/Hib) (Initial U.S. Approval: 2008)

- Children 6 weeks-4 years of age
- 4 dose series
- Administered at 2, 4, 6, and 12-15 months of age

Table 1.1 Doses of Hib-Containing Vaccine Administered, Washoe County, 2018.

Vaccine	WCDHD	VFC Providers	All Other Providers	Total
Hib	304	10,229	2,988	13,521
Hib-Hep B	0	0	0	0
DTaP-IPV/Hib	192	5,578	18	5,788
Total	496	15,807	3,006	19,309

II. Invasive Meningococcal Disease

A. Epidemiology

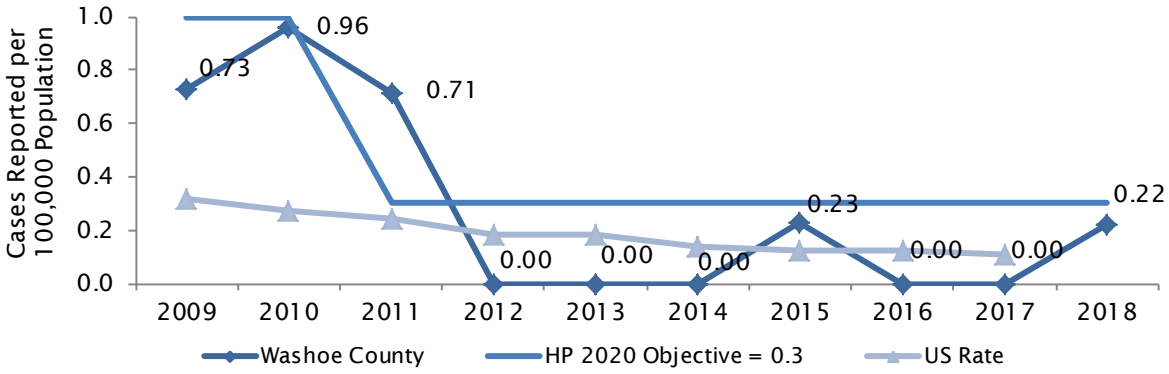
Meningococcal disease is an acute serious illness caused by the bacteria *Neisseria meningitidis.* It is a leading cause of bacterial meningitis and sepsis in the United States. Even with appropriate antibiotic therapy the case fatality rate of meningococcal disease is 10% to 15%. Up to 20% of survivors have permanent health problems including hearing loss, neurological damage or loss of a limb. Anyone can get meningococcal diseases, but rates of disease are highest in children younger than 1 year old with a second peak in adolescence. Among teens and young adults, those 16 through 23 years old have highest rates of meningococcal disease.

1. Reported Incidence

One (1) confirmed case of invasive meningococcal disease was reported in Washoe County in 2018. The 2017 national incidence rate was 0.11 cases per 100,000 population, which was the most current national data. The Healthy People 2020 national health objective for meningococcal disease is 0.3 cases per 100,000 population. Three fatalities due to invasive meningococcal disease have

been reported in Washoe County. These occurred one at a time in 2002, 2010, and 2011.

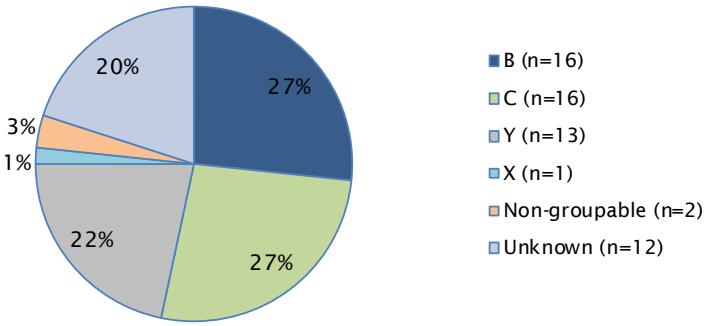
Figure 2.1 Rates of Reported Cases of Invasive Meningococcal Disease, Washoe County, 2009 – 2018.



In the United States, most cases (95% – 97%) of invasive meningococcal disease are sporadic; however, since 1991, the frequency of localized outbreaks has increased. Most of these outbreaks have been caused by serogroup C. Serogroup B accounts for one-third of U.S. cases. The current quadrivalent meningococcal vaccine protects against serogroups A, C, Y and W-135. In 2017, coverage with meningococcal conjugate vaccine (≥1 dose) increased to 85.1 % among adolescents aged 13-17 years in the U.S. from 82.2% in 2016.[2] National data for 2018 was not available at the time of report preparation.

Nationally, from 2013 to November 2018, outbreaks of serogroup B meningococcal disease occurred on 10 college campuses. Two deaths were reported from the University of Wisconsin-Madison and the University of Oregon. Several students suffered neurological effects such as memory loss and difficulty concentrating. One student had both feet amputated.

Figure 2.2 Meningococcal Serogroups, Washoe County, 1995-2018

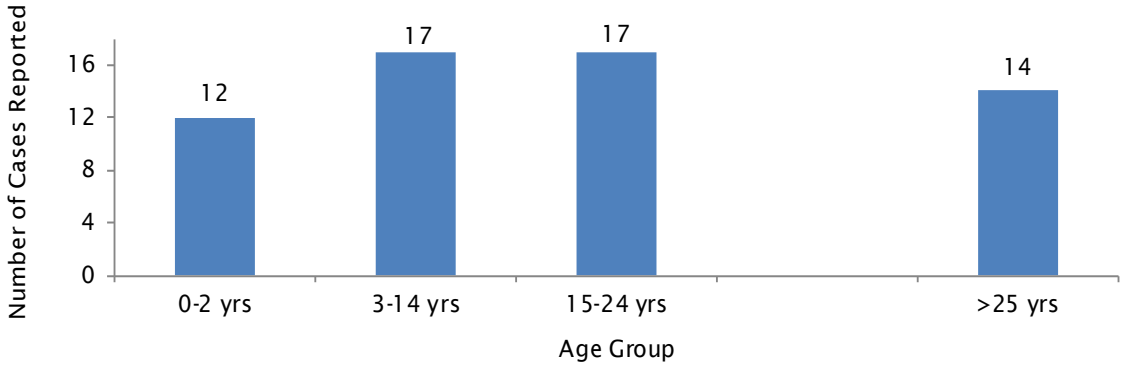


n=60

[2] https://www.cdc.gov/mmwr/volumes/67/wr/mm6733a1.htm

2. Population Affected

Figure 2.3 Invasive Meningococcal Disease Cases by Age, Washoe County, 1995 – 2018 (n=60).



B. Prevention and Control

Meningococcal quadrivalent vaccine is an inactivated vaccine indicated for the active vaccination against meningococcal disease caused by the serogroups A, C, Y and W-135. In 1974, the first meningococcal quadrivalent polysaccharide vaccine, Menomune® was licensed for use in the United States but is no longer available.

Currently there are two quadrivalent conjugated meningococcal vaccines, Menactra® (MenACWY-D), and Menveo® (MenACWY-CRM) indicated for the active vaccination against serogroups A, C, Y and W-135 licensed for use in the United States.

The routine recommendations for quadrivalent conjugated meningococcal vaccines include the following:

Menactra (Initial License: 2005) and Menveo (Initial License: 2010)

- Preteens 11-12 years of age should receive:
  - 1 dose followed by a booster dose at 16 years of age
- Starting July 1, 2017 per Nevada Administrative Code (NAC 392.105 and 394.250) all children enrolling in 7th grade need 1 dose of meningococcal vaccine.
- Adolescents 13-15 years of age with no prior history of meningococcal vaccine should receive:
  - 1 dose followed by a booster dose at 16 years of age
  - Minimum interval between doses is 8 weeks
- Adolescents 16-18 years of age who receive a dose on or after 16 years of age do not need a booster dose.
- All previously unvaccinated first-year college students 19-21 years of age, who are or will be living in a residence hall or received their first dose before 16 years of age should receive a single dose.
- Starting September 1, 2017 per Nevada Administrative Code (NAC 441A.755) all freshmen enrolling in a Nevada university who are less than 23 years of age need one dose of meningococcal vaccine on or after 16 years of age.
- Persons 2 months of age and older (ACIP allows use in persons 56 years of age and older) at increased risk for meningococcal disease.

On October 29, 2014, the FDA licensed the first serogroup B meningococcal vaccine (Trumenba ®).

FDA approved this vaccine for use in people 10-25 years of age as a 3-dose series. In April 2016 the FDA approved a 2-3 dose series depending upon the person's risk factors and the time frames between the doses of vaccine. In May of 2017 the ACIP approved the 2-3 dose recommendation. On January 23, 2015, FDA licensed a second serogroup B meningococcal vaccine (Bexsero®). FDA approved this vaccine for use in people 10-25 years of age as a 2-dose series.[3]

The routine recommendation for meningococcal B vaccines includes the following:

Bexsero (MenB-4C) (Initial License: 2015) and Trumenba (MenB-FHbp) (Initial License: 2014)

- Healthy persons 16-23 years of age (preferred age is 16-18 years) may be given at the healthcare provider's discretion and persons 10 years of age and older at increased risk of meningococcal disease caused by serogroup B (ACIP allows use for persons 26 years of age and older)
  - Bexsero
    - 2 dose series for healthy persons not at increased risk for meningococcal disease caused by serogroup B and for persons 10 years of age and older at increased risk for meningococcal disease caused by serogroup B
    - 0-1 month schedule
  - Trumenba
    - 2 dose series for healthy persons not at increased risk for meningococcal disease caused by serogroup B
    - 0-6 month schedule
  - Trumemba
    - 3 dose series for persons 10 years of age and older at increased risk for meningococcal disease caused by serogroup B (ACIP allows use for persons 26 years of age and older)
    - 0, 1-2 and 6 month schedule

Table 2.1 Doses of Meningococcal Vaccine Administered, Washoe County, 2018.

Vaccine	WCDHD	VFC Providers	All Other Providers	Total
Meningococcal	796	9,238	3,131	**13,165**

III. Invasive Pneumococcal Disease

A. Epidemiology

Streptococcus pneumoniae (pneumococcus) is a leading cause of illness in young children, and a cause of illness and death among elderly persons and persons with certain underlying medical conditions. *S. pneumoniae* causes meningitis, bacteremia, pneumonia and otitis media. In Nevada, only meningitis caused by *S. pneumonia* had historically been a reportable condition. Effective January 1, 2007, enhanced surveillance to include all invasive pneumococcal diseases (IPDs) was implemented. Effective January, 2011, all IPDs became reportable in Nevada.

Eighty-eight percent (88%) of all serotypes that are known to cause invasive disease are included in the 23-valent polysaccharide vaccine, which was licensed in 1983.

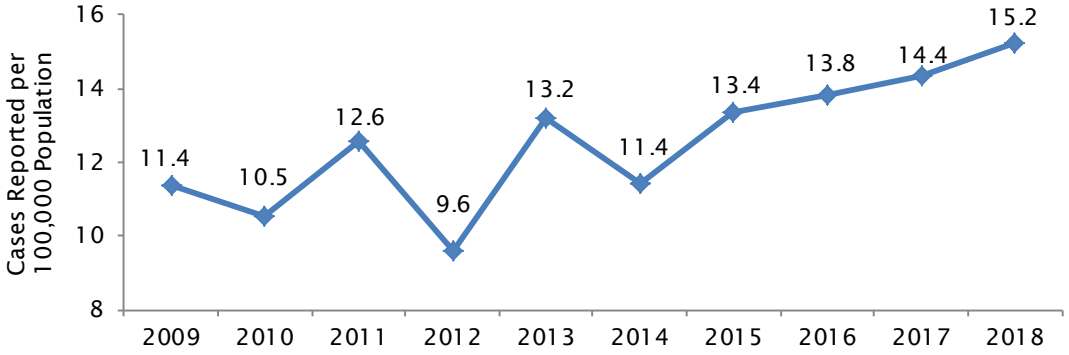
[3] https://www.cdc.gov/vaccines/pubs/pinkbook/mening.html

Before the pneumococcal conjugate vaccine (PCV) was introduced in 2001, over 80% of invasive isolates in children under 5 years of age were included in a 7-valent vaccine. Since February 2010, PCV13 has been licensed and recommended for children in the US and PCV13 replaced the previous version of Prevnar®, known as PCV7. This new vaccine covers the 13 pneumococcal serotypes, which cause the majority of pneumococcal infections in young children.

1. Reported Incidence

Seventy (70) laboratory-confirmed cases of invasive pneumococcal disease (IPD) were reported in Washoe County in 2018 for an incidence rate of 15.2 cases per 100,000 population. The national incidence rate (all invasive pneumococcal disease) in 2017 was 8.08 cases per 100,000 and 7.64 cases per 100,000 population among children under five years. The Healthy People 2020 national health objective for IPD is 12 cases per 100,000 population among children under 5 years. Washoe County's incidence in 2018 for this age group was 7.1 cases per 100,000 population. The Healthy People 2020 national health objective for IPD is 36 cases per 100,000 population among adults 65 years and older. Washoe County's incidence in 2018 for this age group was 25.58 cases per 100,000 population. Of the 70 IPD cases in 2018, three (3) cases were fatal. Three (3) of the fatal cases were in adults. One (1) case was White and one (1) Black, and one (1) unknown race. Two cases were male.

Figure 3.1 Rate of Reported Cases of Invasive Pneumococcal Disease, Washoe County, 2009 – 201.



2. Population Affected

Figure 3.2 Invasive Pneumococcal Disease Cases by Age and Gender, Washoe County, 2018.

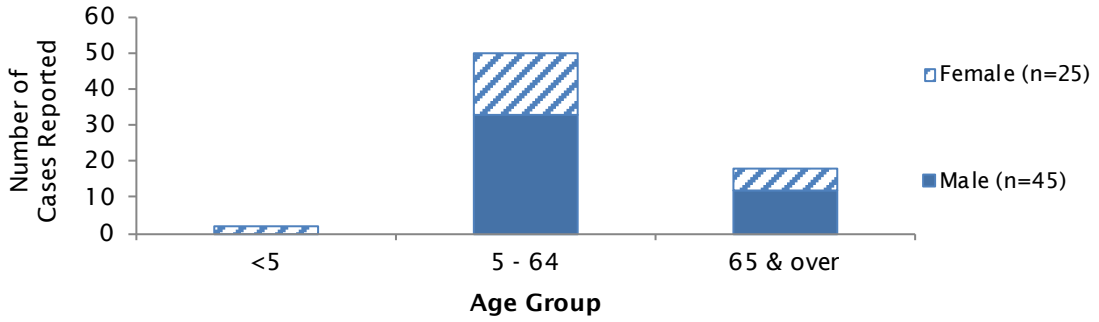
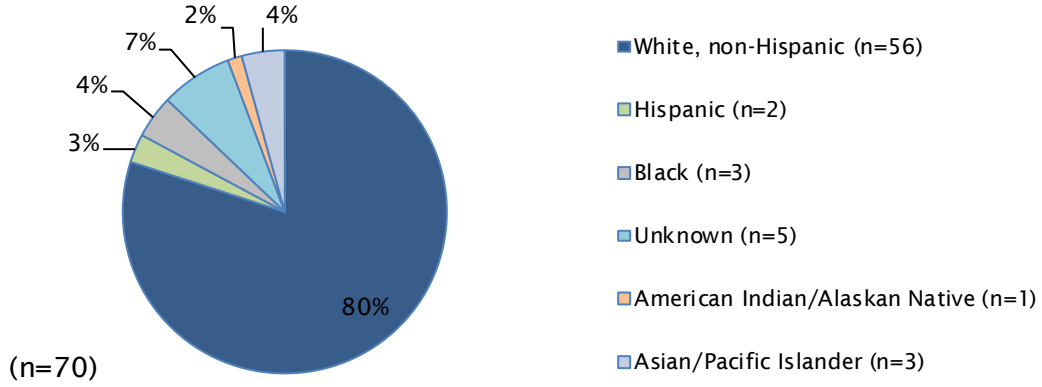


Figure 3.3 Invasive Pneumococcal Disease Cases By Race/Ethnicity, Washoe County, 2018.



B. Prevention and Control

Pneumococcal vaccine is an inactivated vaccine indicated for the active vaccination against Streptococcus pneumoniae (pneumococcus). There is one pneumococcal 13 valent conjugate vaccine, Prevnar 13® (PCV13) and one pneumococcal 23 valent polysaccharide vaccine, Pneumovax 23® (PPSV23) licensed for use in the United States. Please note that each of the pneumococcal vaccines is licensed for specific age groups and indications.

The routine recommendations for pneumococcal vaccines include the following:

Prevnar 13 (PCV13) (Initial U.S. Approval: 2010)

- Children 6 weeks-4 years of age (required for childcare since 2007)
  - 4 dose series
  - Recommended at 2, 4, 6, and 12-15 months of age
- Adults 65 years of age and older
  - Single dose

Pneumovax 23 (PPSV23) (Initial U.S. Approval: 1983)

- Adults 66 years of age and older at least one year after receiving Prevnar13 (PCV13) and at least 5 years after their previous dose of Pneumovax 23 (PPSV23) (if applicable).
  - Single dose

Since October 31, 2007, *Streptococcus pneumoniae* vaccination has been required for all children enrolled in a childcare facility in Nevada.

Table 3.2 Doses of Pneumococcal-Containing Vaccine Administered, Washoe County, 2018.

Vaccines	WCHD	VFC Providers	All Other Providers	Totals
PNUcon*	479	20,684	7,968	29,131
PNUps**	74	4,134	5,439	9,647
TOTALS	553	24,818	13,407	38,778
*conjugated vaccine **polysaccharide vaccine				

IV. Pertussis

A. Epidemiology

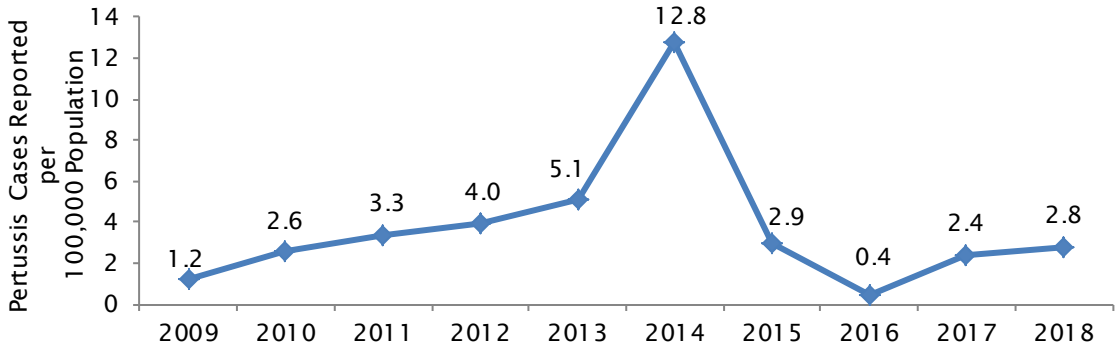
Pertussis, or "whooping cough," is caused by the bacteria *Bordetella pertussis*. The bacteria attaches to the ciliated epithelial cells of the respiratory track. Toxin produced by the bacteria paralyzes the cilia which interferes with the clearing of pulmonary secretions. Pneumonia is the most common complication. Young infants are at highest risk for developing complications,

1. Reported Incidence

In 2018, 5 confirmed case and 8 probable cases of pertussis were reported in Washoe County for an incidence of 2.83 cases per 100,000 population. The 2018 provisional national incidence was 4.1 cases per 100,000 population[4]. The Healthy People 2020 national health objective for pertussis is to reduce the incidence in children under age 1 year by 10% from the 2004-2008 baseline of 2,777 to 2,500. In 2014, the highest incident rate was reported in the past decades (see 2014 Annual Communicable Disease Summary).

[4] https://www.cdc.gov/pertussis/downloads/pertuss-surv-report-2018-508.pdf

Figure 4.1 Rates of Reported Cases of Pertussis, Washoe County, 2009– 2018.



2. Population Affected

The median age of reported pertussis cases was 17 years (range: 6 month – 67 years). Nine (9) cases were female, eight (8) white, four (4) Hispanic and one (1) unknown. Two (2) infant cases were hospitalized for 1 days each and no deaths were reported. Seventy-seven (77%) of reported cases had received the recommended doses of pertussis-containing vaccine.

Table 4.1 Rate of Reported Cases of Pertussis by Age, Washoe County 2018.

Age	No. of Cases	%
< 1	2	15.4%
1-9	1	7.7%
10-19	5	38.5%
20-29	1	7.7%
30-39	0	0.0%
40-49	1	7.7%
50-59	1	7.7%
60-65	1	7.7%
+65	1	7.7%
Total	13	100.0%

B. Prevention and Control

A pertussis containing vaccine has been available since the 1940s. In 1991 the FDA approved the first acellular pertussis containing vaccines because of concerns about the safety of whole-cell pertussis. Initially pediatric diphtheria, tetanus, acellular vaccine DTaP vaccine was only approved for the fourth and fifth dose of the vaccine series. In 1997, the ACIP recommended DTaP for all 5 doses in the diphtheria, tetanus, acellular pertussis vaccine series to replace whole-cell pertussis vaccine. In 2005, the FDA approved two adolescent/adult formulations of tetanus, diphtheria, acellular pertussis vaccines.

Acellular pertussis vaccine is an inactivated vaccine indicated for the active vaccination against pertussis. It is only available in combination with diphtheria and tetanus vaccine antigens. There are two pediatric formulations of diphtheria, tetanus, acellular pertussis vaccines, Daptacel® (DTaP) and Infanrix® (DTaP) and two

adolescent/adult formulations of tetanus, diphtheria acellular pertussis vaccines Boostrix® (Tdap) and Adacel® (Tdap).

There are four pediatric diphtheria, tetanus, and acellular pertussis vaccines, in combination with other vaccine antigens. These vaccines include diphtheria, tetanus, acellular pertussis, hepatitis B, inactivated polio vaccine-Pediarix® (DTaP-HepB-IPV); diphtheria, tetanus, acellular pertussis, inactivated polio vaccine, Haemophilus influenzae type b-Pentacel® (DTaP-IPV/Hib); diphtheria, tetanus, acellular pertussis, inactivated polio vaccine-Kinrix® (DTaP-IPV) and Quadracel® (DTaP-IPV) licensed in the United States. Please note the pertussis containing vaccines are licensed for specific age groups and indications.

The routine recommendations for pertussis containing vaccines include the following:

Daptacel® (DTaP) (Initial U.S. Approval: 2002) and Infanrix® (DTaP) (Initial U.S. Approval: 1997)

- Children 6 weeks-6 years of age
- 5 dose series
- Administered at 2, 4, 6, 12-18 months and 4-6 years of age

Pediarix® (DTaP-HepB-IPV) (Initial U.S. Approval: 2002)

- Children 6 weeks-6 years of age
- 3 dose series
- Administered at 2, 4, and 6 months of age

Pentacel® (DTaP-IPV/Hib) (Initial U.S. Approval: 2008)

- Children 6 weeks-4 years of age.
- 4 dose series
- Administered at 2, 4, 6 and 12-18 months of age

Kinrix®, (DTaP-IPV) (Initial U.S. Approval: 2008) and Quadracel® (DTaP-IPV) (Initial U.S. Approval: 2015)

- Children 4-6 years of age
- Single dose

Adacel® (Tdap) (Initial U.S. Approval: 2005) and Boostrix® (Tdap) (Initial U.S. Approval: 2005)

- Children 7-10 years of age (ACIP allows use) who have not completed the primary series of diphtheria, tetanus, acellular pertussis vaccine
- Unvaccinated adolescents 11-12 years of age (required for 7th grade enrollment in all public and private schools in Nevada)
- Unvaccinated adolescents 13-18 years of age
- Unvaccinated adults 19 years of age and older (ACIP allows use of Adacel in adults 65 years of age and older)
- Pregnant women during each pregnancy regardless of their previous history of Tdap vaccination, preferably early in the 27-37 gestational week window to maximize maternal antibody response and passive antibody transfer to the infant
- Unvaccinated postpartum women

- Single dose in a life time (except for pregnant women, adolescents who received a dose between 7-10 years of age to complete their primary series and when Td vaccine is not available for routine vaccination or wound management)

A total of 35 persons were identified as contacts to pertussis cases and 29 received prophylaxis.

Table 4.2 Doses of Pertussis- Containing Vaccine Administered, Washoe County, 2018.

Vaccines	WCHD	VFC Providers	All Other Providers	Totals
DTaP	190	4,341	1,175	5,706
DTaP-HepB-IPV	303	7,370	2,576	10,249
Tdap	847	15,152	15,346	31,345
DTaP-IPV/Hib	192	5,578	18	5,788
DTaP-IPV	348	4,114	981	5,443
TOTALS	1,880	36,555	20,096	58,531

V. Rotavirus

A. Epidemiology

1. Population Affected

Rotavirus is the most common cause of severe diarrhea among children. In the U.S., the highest rates of illness occur among infants and young children, and most children are infected by 5 years of age. Adults can also be infected, though disease tends to be mild. The annual epidemic peak in the U.S. characteristically starts during autumn in the southwest, and moves sequentially to reach the northeast by spring.

2. Reported Incidence

Twelve (12) laboratory-confirmed cases of rotavirus were reported in Washoe County in 2018. Of the 12 cases, 9 (69%) were in the age group 0 – 2 years. The 2018 reported incidence of rotavirus infection was 54 cases per 100,000 children $\leq$ 2 years of age (population for this age group was 16,801 in 2018).

Figure 5.1 Rate of Reported Cases of Rotavirus in Children ≤ 2 Years of Age, Washoe County, 2009-2018.

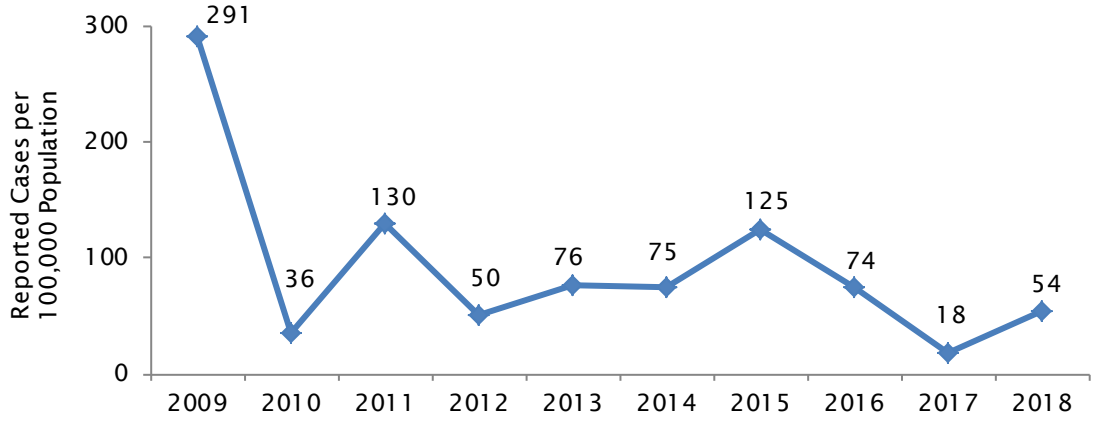
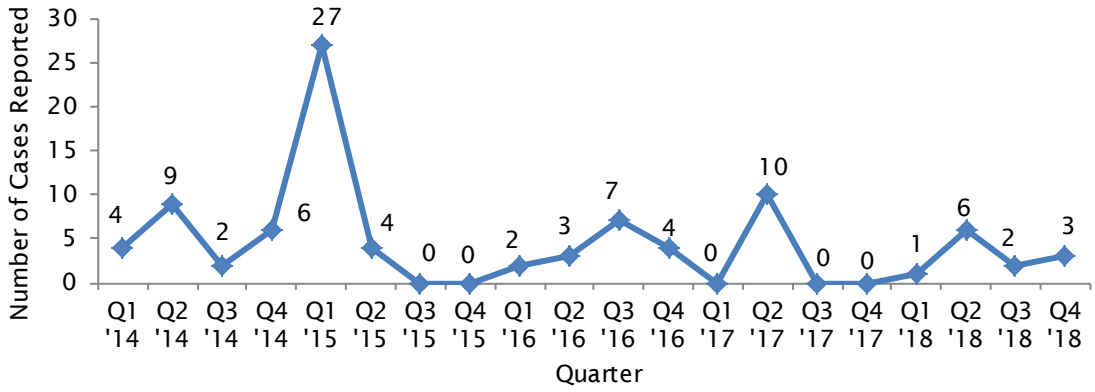


Figure 5.2 Reported Rotavirus Cases By Quarter, Washoe County, 2014- 2018.



In 2018, no confirmed rotavirus outbreaks were reported or identified in Washoe County.

B. Prevention and Control

Rotavirus vaccine is an oral live virus vaccine indicated for the active vaccination against rotavirus. There are two rotavirus vaccines, RotaTeq® (RV5) and Rotarix® (RV1) licensed for use in the United States.

The routine recommendations for rotavirus vaccines include the following:

RotaTeq® (RV5) (Initial U.S. Approval 2006)

- Children 6 weeks-8 months of age
- 3 dose series
- Administered at 2, 4, and 6 weeks of age

Rotarix® (RV1) (Initial U.S. Approval 2008)

- Children 6 weeks-8 months of age
- 2 dose series
- Administered at 2 and 4 months of age

Table 5.1 Doses of Rotavirus Vaccine Administered, Washoe County, 201.

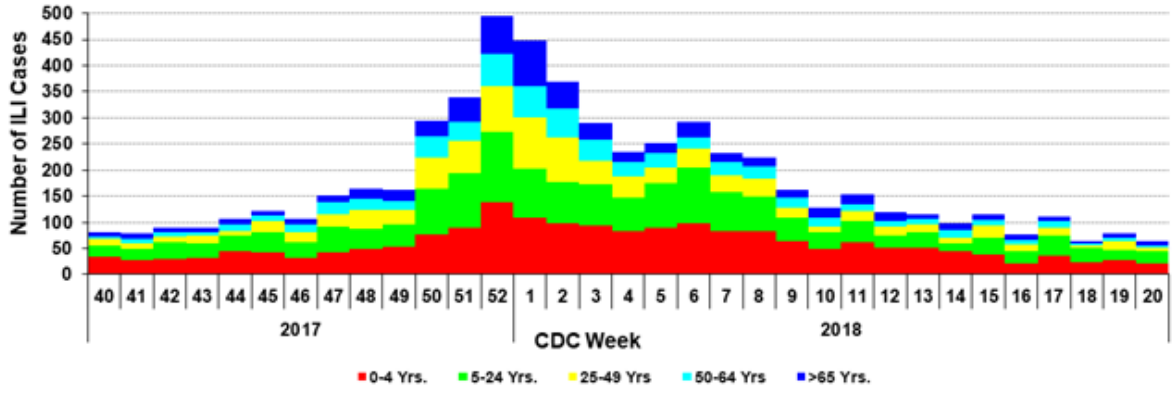
Vaccine	WCHD	VFC Providers	All Other Providers	Total
Rotavirus	142	9,897	1,978	12,017

VI. Influenza

A. The Washoe County Health District has participated in the CDC national influenza surveillance program since 1984 and conducts year-round influenza surveillance. Emergency departments, urgent cares, private providers and University of Nevada-Reno (UNR) Student Health Services participate by reporting the number of patients seen with influenza-like illness (ILI) on a weekly basis and collecting specimens for PCR testing. ILI is defined as a fever ≥ 100˚ F **AND** a cough and/or sore throat, in the absence of a known cause other than influenza.

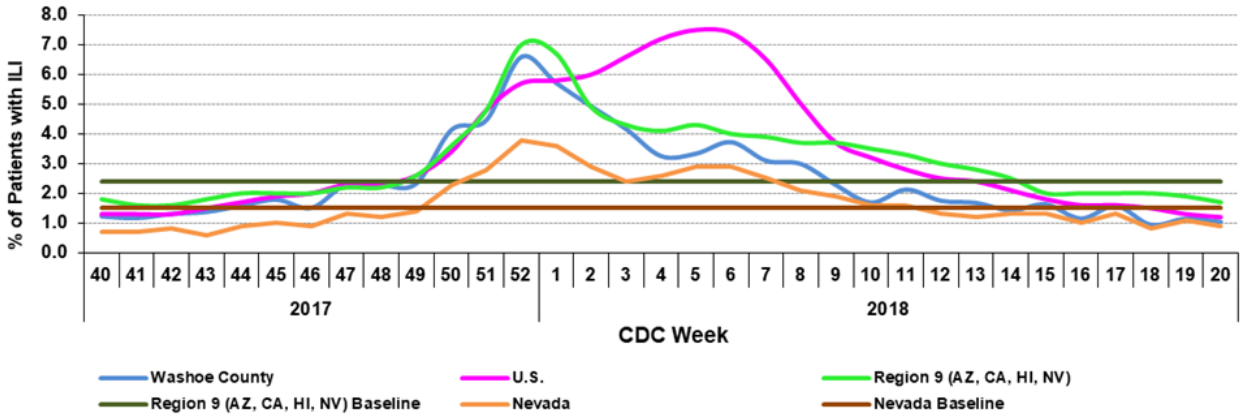
The 2017-18 influenza season had the greatest number of confirmed cases ever reported in Washoe County in a single season. A total of 5,522 confirmed cases, 542 hospitalizations, and 26 deaths due to influenza were reported. Nationwide the 2017-18 influenza season was classified as a high severity season by the CDC. The 2017-18 season was the first season to be classified as high severity across all age groups

Figure 6.2 Number of ILI Cases by Week and Age Group Reported by Sentinel Physicians, Washoe County Influenza Surveillance, 2017–18.



The percentage of overall patient visits for ILI in Washoe County peaked at 6.6% during the week ending on December 30, 2017 (Week 52, Figure 6.3). During the two influenza seasons before the H1N1 pandemic (2007-08 and 2008-09), the peak percentage of patient visits for ILI ranged from 5.9-7.3% and occurred in mid-to late February and early March. During the 2009 H1N1 pandemic, however, the percentage of patient visits for ILI peaked at 7.2% in mid-October. During the six influenza seasons after the H1N1 pandemic (2011-12, 2012-13, 2013-14, 2014-15, 2015-16, and 2016-17) the peak percentage of the patient visits for ILI ranged from 3.5%-6.0% and occurred in early March (twice), mid-February, late December (twice), and early January.

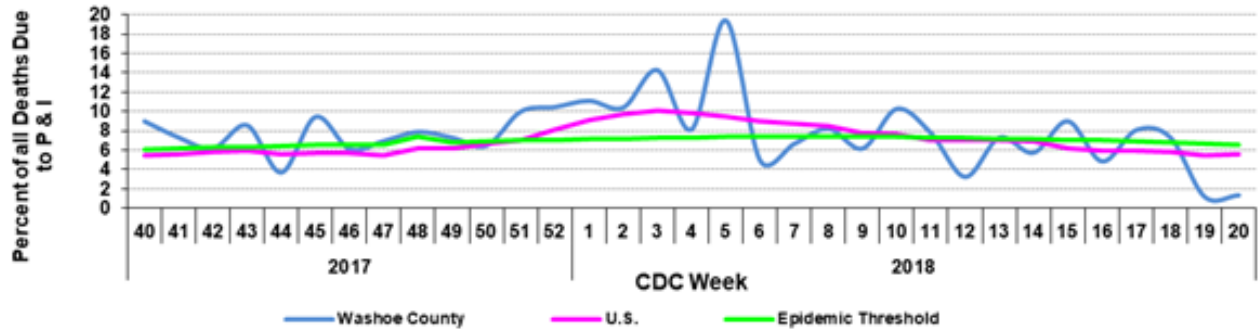
Figure 6.3 Proportion of Patients Seen with ILI by Sentinel Physicians, Washoe County Influenza Surveillance, 2017-18.



The proportion of deaths due to pneumonia and influenza (P&I ratio) in Washoe County peaked at 19.4% during the week ending February 3, 2018 (week 5, Figure 6.4). During the previous seasons, the peak percentage of deaths attributed to P&I was as follows:

- 2009-10 season (2009 pandemic): 15%.
- 2010-11 season: 19.5%
- 2011-12 season: 13.7%
- 2012-13 season: 22.1%
- 2013-14 season: 27.8%
- 2014-15 season: 16.7%
- 2015-16 season: 14.9%
- 2016-17 season:15.4%

Figure 6.4 Pneumonia and Influenza Mortality, Washoe County Influenza Surveillance, 2017-18.

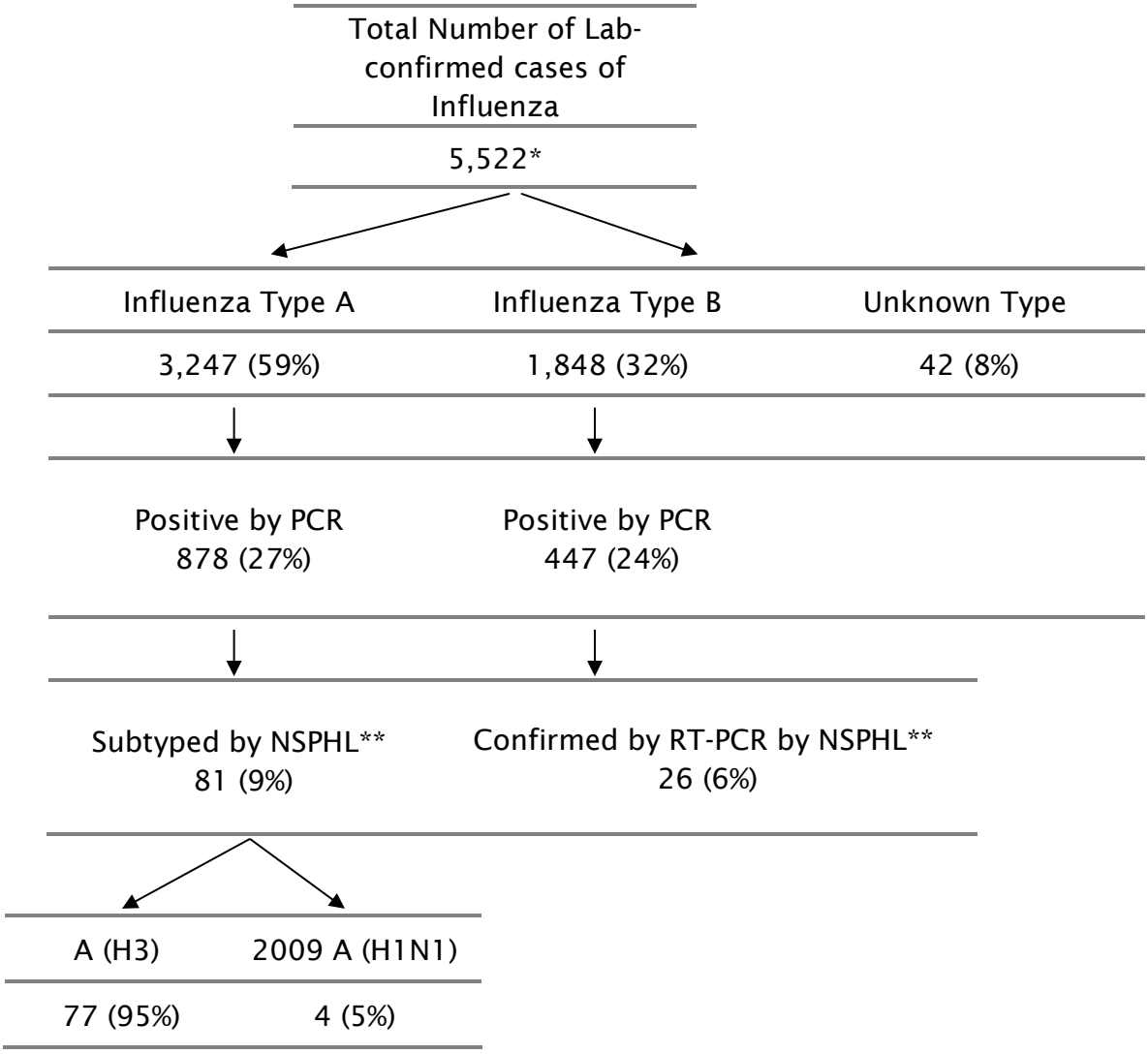


The large variation in P&I from week to week is likely attributable to the relatively small population size of the county as compared to the U.S. as a whole. In addition, the P&I percent each week is calculated based on when the death is registered. This, in turn, can be impacted by staffing levels in the office of Vital Statistics. The data can also be skewed as a result of vacation, sick leave or a holiday occurring during a particular week.

WCHD provided viral culture media to three (3) sentinel providers who collected specimens from patients whose signs and symptoms met the ILI definition. Sentinel providers submitted 66 specimens to the Nevada State Public Health Laboratory (NSPHL) for viral testing. Forty-four (44) specimens (67%) were positive for influenza by RT-PCR (Real Time Reverse Transcription Polymerase Chain Reaction). Twenty-seven (61%) positive specimens were identified as influenza type A; 26 (96%) were influenza A (H3) and 1 (4%) was influenza A 2009 H1N1. Seventeen (39%) positive specimens were identified as influenza type B; all 17 (100%) were influenza B (Yamagata).

A total of 5,522 laboratory-confirmed cases of influenza were reported in Washoe County during the 2017-18 surveillance season (Figure 6.5). Of these 5,522 cases, 1,326 (24%) were positive by PCR. Influenza A predominated during the 2017-18 influenza season, accounting for 59% of confirmed cases. Among influenza A positive results confirmed by NSPHL, 95% were influenza A (H3). The earliest specimen confirmed by PCR was a specimen collected on October 3, 2017. This specimen was collected by a hospital and subsequently identified as influenza A (not subtyped).

Figure 6.5 Influenza Testing Results, Washoe County, October 1, 2017 - May 19, 2018



* Nevada State Public Health Laboratory. Note that some facilities in addition to recruited sentinel sites submit specimens to NSPHL for testing.

Figure 6.6 Test Results from Sentinel Providers, Washoe County Influenza Surveillance, 2017 – 18.

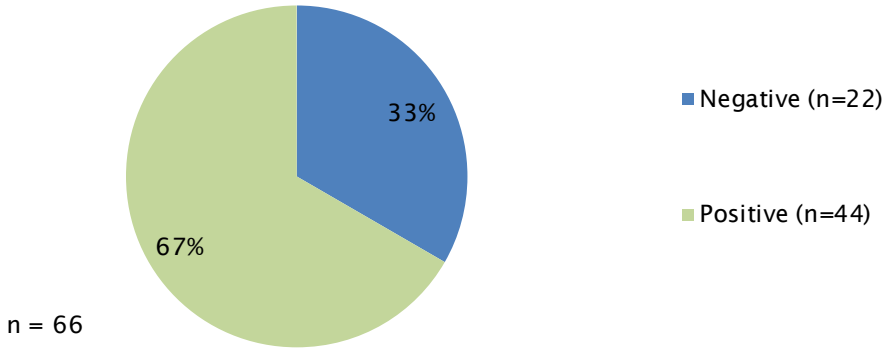
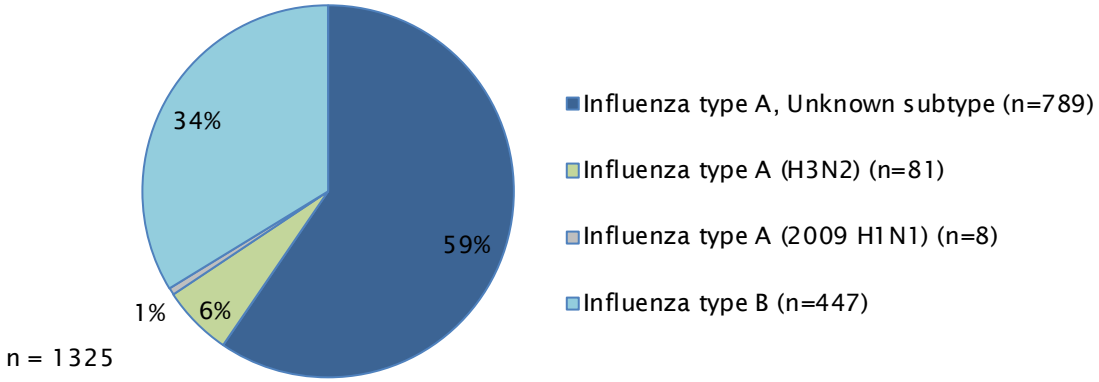


Figure 6.7 Influenza Positive Specimens by Type, Washoe County Influenza Surveillance, 2017–18.



The CDC performed antigenic characterization for one influenza A specimen from Washoe County. NSPHL did additional characterization for 25 influenza B specimens (Table 6.1).

Table 6.1 Antigenic Characterization of 12 Confirmed Influenza Isolates, Washoe County, 2017 – 18.

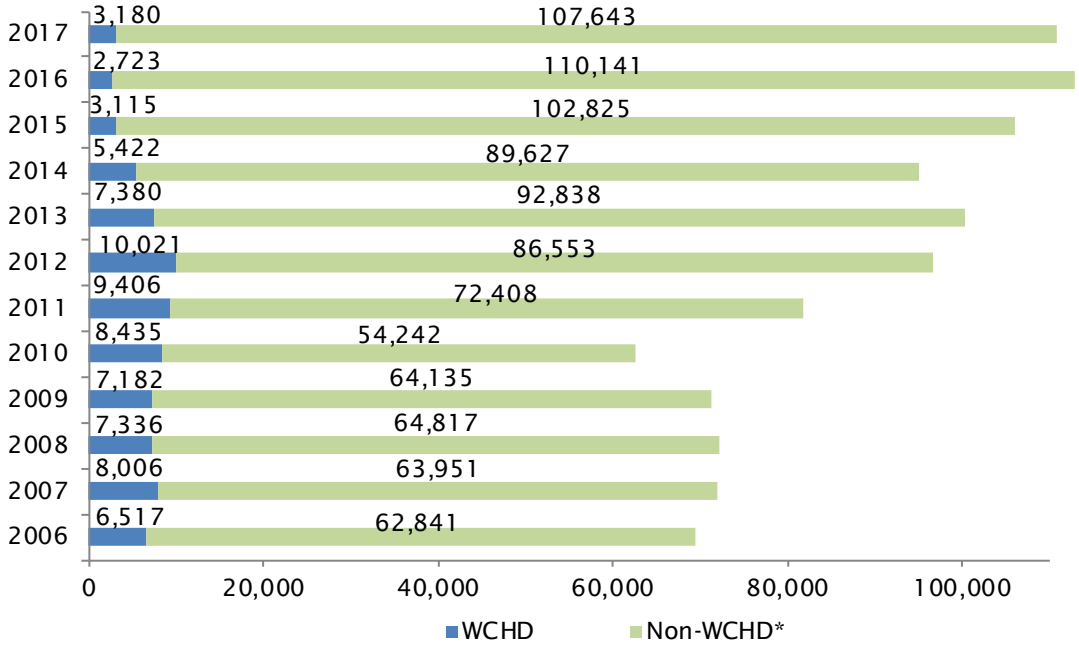
Total #	Influenza Type	PCR Suptype	Antigenic Characterization
1	A	A (H3N2)	A/Hong Kong/4801/2014-Like (H3N2) GP
25	B	B	B/Yamagata Lineage

B. The 2017–18 U.S. trivalent influenza vaccines contained an A/Michigan/45/2015 (H1N1)pdm09–like virus, an A/Hong Kong/4801/2014 (H3N2)–like virus, and a B/Brisbane/60/2008–like virus (Victoria lineage). Quadrivalent vaccines included an additional vaccine virus strain, a B/Phuket/3073/2013–like virus (Yamagata lineage). All of the above virus strains were components of the 2017-2018 seasonal influenza vaccine; however, all of the influenza B viruses typed by NSPHL were Yamagata lineage, which was only included in the quadrivalent vaccine. Since 2009 vaccine effectiveness for A (H3N2) viruses has typically been lower than for A (H1N1) and influenza B viruses. Possible reasons for this include more frequent antigenic changes among A (H3N2) viruses, egg-adapted changes during vaccine production, and host factors. This trend of reduced vaccine effectiveness against A (H3N2) viruses continued during the 2017-18 season during which influenza A (H3N2) infections predominated.

C. Prevention and Control

Since 2010 the Advisory Committee on Immunization Practices (ACIP) has recommended for all persons 6 months of age and older to receive an annual influenza vaccination unless there is a contraindication. Vaccinating persons at high risk for influenza complications is the most effective means of reducing the impact of influenza. The majority of influenza vaccine is administered from the beginning of fall through December, which is the optimal time to vaccinate.

Figure 6.8 Total Doses of Influenza Vaccine Administered by WDHD and Non-WCHD Clinics, 2005 – 2018.



* 110,823 doses of flu vaccine were entered into WebIZ by local providers, which includes
Private physicians
Costco Pharmacy
CVS Pharmacy
Don's Pharmacy
HAWC
Northern Nevada Medical Center
Raley's Pharmacy
REMSA
Renown Health System
Safeway Pharmacy
Saint Mary's Regional Medical Center
Savemart Pharmacy
Scolari's
Smith's Pharmacy
Tahoe Pacific Hospital
Target Pharmacy
University Health Systems,
University of Nevada Reno Student Health Center
Walgreens

VECTOR- BORNE DISEASES

I. Mosquito- Borne Diseases

A. Arboviral Encephalitides

Arthropod-borne viruses or "arboviruses" occur in nature by cycling between vertebrates and invertebrate disease vectors. Humans and domestic animals can become accidental hosts when exposed to vector species. Mosquitoes in the genus *Culex* are the primary vectors of mosquito-borne arboviruses. Two *Culex* species (*Culex tarsalis* and *Culex pipiens*) are common in the Truckee Meadows. Viruses associated with these two species and human diseases include: St. Louis Encephalitis (SLE), Western Equine Encephalomyelitis (WEE), and most recently West Nile Virus (WNV).

1. West Nile Virus Reported Incidence

WNV first appeared in the United States in New York in 1999 and caused West Nile Virus Disease. WNV disease is often categorized into two primary groups: neuroinvasive disease such as aseptic meningitis or encephalitis and nonneuroinvasive disease such as West Nile Fever. Table 1.1 summarizes human WNV disease in the U.S.

Table 1.1 Summary of WNV Cases, U.S., 1999-2017

Year	Neuroinvasive disease	Non-Neuroinvasive	Total Human Cases Reported to CDC	Deaths	Case Fatality Rate (%)
2009	386	334	720	32	4.4
2010	629	392	1,021	57	5.6
2011	486	226	712	43	6.0
2012	2,873	2,801	5,674	286	5.0
2013	1,267	1,202	2,469	119	4.8
2014	1,347	858	2,205	97	4.4
2015	1,455	720	2,175	146	6.7
2016	1,309	840	2,149	6	0.3
2017	1,425	672	2,097	146	7.0
2018	1,658	989	2,647	167	6.3
Total	12,835	9,034	21,869	1,099	5.1

b. Population Affected

Two (2) cases of West Nile Virus (WNV) were reported in Washoe County in 2018. Both cases were non-neuroinvasive. One (1) case had travel history to a foreign country with a significant prevalence of WNV. Statewide, Nevada had a total of 9 cases, 6 non-neuroinvasive, 3 neuroinvasive, and 0 death. No deaths due to WNV occurred in Washoe County in 2018.

B. Parasitic Diseases

1. Malaria

Malaria is caused by infection with any of four species of the protozoan parasite *Plasmodium* (i.e., *P. falciparum*, *P. vivax*, *P. ovale*, *P. malariae*). The *Plasmodium* parasite is transmitted by the bite of an infected Anopheline mosquito. Until the 1940s, malaria was endemic in the United States.

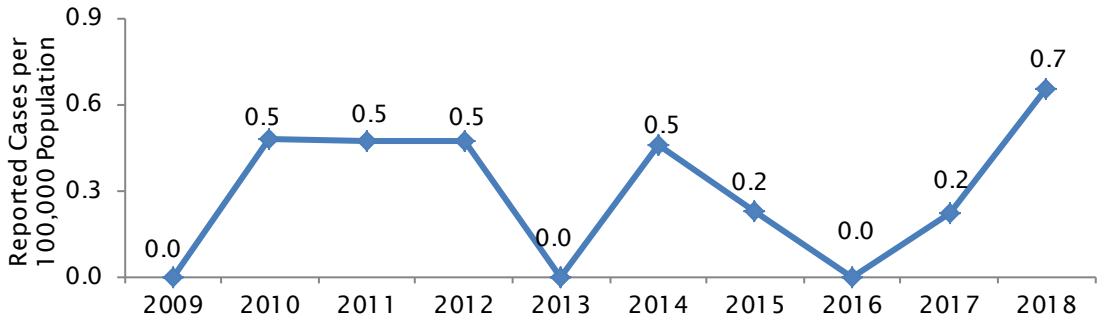
Anopheles mosquitoes are present in the Truckee Meadows, although most likely not in dense enough numbers for the transmission of malaria.

The Healthy People 2020 national health objective for malaria is to reduce the number of cases of malaria reported in the United States from the 1,298 new cases reported in 2008 to 999 new cases in 2020.

a. Reported Incidence

Three (3) cases of malaria were reported in Washoe County in 2018.

Figure 1.1 Annual Rates of Reported Cases of Malaria, Washoe County, 2009 – 2018.



b. Population Affected

Three (3) cases of malaria were reported in Washoe County in 2018. All cases were Black males between the age of 1 and 9 years old. These three cases had travel history to a foreign county where malaria is endemic.

C. Mosquito- Borne Disease Surveillance, Prevention & Control

The District Health Department's Vector-Borne Diseases Program (VBDP) conducts field surveillance, prevention and control activities in Washoe County for diseases transmitted to people by animal vectors.

1. Surveillance

Mosquito-borne disease surveillance consists of monitoring conditions necessary for viral disease transmission, including adequate extrinsic incubation temperature, a minimum density of mosquitoes, and the presence of virus. These contributing conditions are monitored in order to evaluate the risk of virus transmission to

humans. Controlling the mosquito population for these viruses also controls malaria and other potential parasitic diseases

a. Environmental Conditions

Extrinsic incubation temperature refers to the temperature needed for the pathogen to survive and multiply within the hemocoel (a blood-containing body cavity) and salivary glands of the mosquito. Daily average temperatures must exceed 65° F for Western Equine Encephalitis (WEE) and 75° F for Saint Louis Encephalitis (SLE) for 10 days or more. The optimal average daily temperature for West Nile Virus (WNV) appears to be approximately 80°F.

b. Mosquito Population Density

Adult mosquito surveillance is conducted through the use of New Jersey Light Traps. The minimum density of mosquitoes required for transmission of WEE and SLE is 10 or more females per New Jersey trap per night. The minimum density for WNV appears to be lower, although the value has not yet been determined definitively. Densities of vector-competent mosquito species are plotted against daily average temperatures, providing a "real-time" indicator of disease transmission risk.

c. Testing for the Presence of Arboviruses

1) Sentinel Chickens

Studies show that sentinel birds will test positive for antibodies to WEE, SLE and WNV approximately two weeks before the disease occurs in humans. This provides a window of opportunity to increase control efforts in the geographic area where the virus is identified.

Three sentinel chicken flocks of 10 chickens each were placed at Washoe County sites based on the local prevalence of vector species and proximity to human populations. Flocks are sampled bi-weekly from June through September. Blood samples are tested for antibodies specific to WEE and SLE. SLE and WNV are members of the same virus family *Flaviviridae*, so serological tests cross-react. Therefore, any samples that test positive for SLE are further tested for WNV.

No samples tested positive for Flaviviruses (potential West Nile Virus) or Alphaviruses in Washoe County in 2018.

2) Wild Birds

Five (5) birds were tested for West Nile Virus in 2018. Birds tested were three Mallard Ducks, one Scrub Jay, and one Stellar Jay. The Scrub Jay tested positive for West Nile Virus.

3) Mosquitoes

Collection of adult female mosquitoes for Arbovirus testing was conducted by WCHD-VBDP in cooperation with the Nevada State Department of Agriculture, Animal Disease Laboratory (ADL) and the Nevada State Department of Agriculture, Entomology Program. Adult female mosquitoes were trapped using a variety of trapping methods. VBDP staff trapped and identified (to the species and sex) of 7,080 mosquitoes from 355 pools.

The Nevada State Department of Agriculture ADL performed tests (RT-PCR) for all pools, which included tests for the primary arboviruses of concern. This included the Flaviviruses West Nile Virus and St. Louis Encephalitis (family Flaviviridae, genus *Flavivirus*) and the Alphavirus Western Equine Encephalomyelitis (family Togaviridae, genus *Alphavirus*). Results are typically reported within 24-48 hours of submission allowing the VBDP and other participating agencies to respond to foci of infected mosquito populations with appropriate control measures.

A total of 11 mosquito pools tested positive for West Nile Virus in Washoe County in 2018.

2. Mosquito Abatement

a. Ground and Aerial Larvicides and Aerosol Fog Applications

The use of ArcGIS software and digital orthophotography (provided by Washoe County IT-GIS) has become a standard tool in conducting field surveys and aerial larvicide applications. Digital maps provide for highly accurate larvicide applications while GPS units simultaneously records treated areas. Table 1.2 shows the numbers of acres treated and numbers of treatment.

Table 1.2 Acres Treated for Mosquito Control, 2018.

Method/Location	Acres Treated	Number of Treatments
Larvicide Applications	4,384	107
Adulticide Fog Applications	2,881	19
Totals	7,265	126

b. Storm Drain Catch Basins

A geodatabase (ArcGIS® software) is used to manage the survey and treatment data and is currently populated with over 20,000 catch basins. Field staff utilize mobile GIS/GPS "PDA's" (Nomad®) equipped with ArcPad® software allowing digital maps to be taken into the field. This equipment automates field data collection (e.g., date visited, number of larvae present, treatment used, etc.) as well as integrates the data into the geo-database.

Continued surveillance of storm drain catch basins confirms that they are a significant source of urban mosquitoes, especially *Culex pipiens* and *Culiseta incidens*. During the 2018 summer season, VBDP staff made 7,256 storm drain catch basin treatments.

II. Flea- borne Diseases

A. Plague

Plague, caused by the bacterium *Yersinia pestis*, is endemic in most of the western United States. It is associated with rodents and their fleas. When outbreaks occur in rodent populations, many rodents die and their fleas look for blood meals elsewhere. People living in or visiting areas where there has been a rodent "die off" (epizootic) are at increased risk for contracting plague. Humans usually become infected from being bitten by infected rodent fleas.

1. Reported Incidence

No cases of plague (*Yersinia pestis*) were reported in Washoe County in 2018.

2. Population Affected

No cases of plague (*Yersinia pestis*) were reported in Washoe County in 2018.

B. Surveillance, Prevention and Control

1. Animal Testing

The VBDP screens and submits rodents to the Nevada Department of Agriculture Animal Diseases Lab (ADL) to test for *Yersinia pestis*. Zero (0) of four (4) rodent tissue specimens collected by VBDP staff tested positive for plague by ADL using fluorescent antibody testing. Results are summarized below.

Table 1.3 Summary of Rodent Tissue Test for *Yersinia pestis*, Washoe County, 2018.

Species	Common Name	# Positive	# Tested
Otospermophilus beecheyi	California ground squirrel	0	4
Total		**0**	**4**

2. Flea Suppression

The VBDP conducts regular flea suppression in Washoe County to reduce the risk of plague. Rodent burrows are treated with a dust insecticide, DeltaDust®, that kills fleas on rodents and fleas in the burrow. Treatment sites are chosen based on history of plague activity, flea load of reservoir rodent populations and areas of human recreation.

In 2018 the VBDP conducted flea suppression at the following locations:

- Bartley Ranch Regional Park,
- Bowers Mansion Regional Park,
- Davis Creek Regional Park,
- Idlewild Park,
- Manzanita Park,
- Wheatland Park
- Paradise Park,
- Rancho San Rafael Regional Park,
- South Valleys Regional Park,
- Sand Harbor State Park,
- Lazy 5 Regional Park

III. Tick- Borne Diseases

A. Lyme Disease

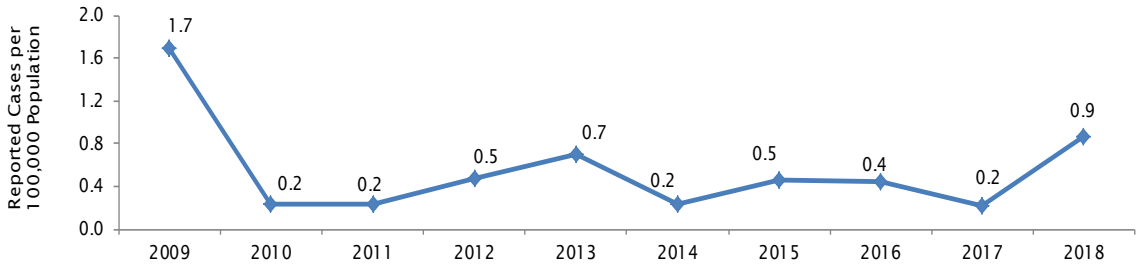
Lyme disease, caused by infection with *Borrelia burgdorferi*, is not common in Nevada but is one of the most commonly reported vector-borne diseases in the United States. A total of 29513 confirmed cases were reported nationally in 2017 for an incidence rate of 9.1 cases per 100,000 population, which was the most current national data. While most cases are reported from the northeastern, north-central and Pacific coastal regions, occasional cases occur in the interior western U.S. In the northeastern and north-central United States, the blacklegged tick or deer tick *(Ixodes Scapularis*) transmits Lyme disease. In the Pacific coastal United States, the disease is spread by the Western blacklegged tick (*Ixodes Pacificus*). Other tick species found in the United States have not been shown to transmit *Borrelia burgdorferi*.

The Healthy People 2010 national health objective for Lyme disease is 9.7 new cases per 100,000 population in endemic states; There is no Healthy People 2020 objective available for Lyme disease, to-date.

1. Reported Incidence

One (1) confirmed case of Lyme disease and three (3) probable cases reported in Washoe County in 2018.

Figure 3.1 Annual Rates of Reported Cases of Lyme Disease, Washoe County, 2009 – 2018.



2. Population Affected

The median age of the four (4) cases was 31.5 years (range: 26 years - 52 years). Two (2) were female. All cases were White, non-Hispanic. One (1) confirmed case acquired the disease outside of Nevada

and the remaining three (3) cases were unknown as to the location of exposure. No hospitalizations were reported and no deaths were reported.

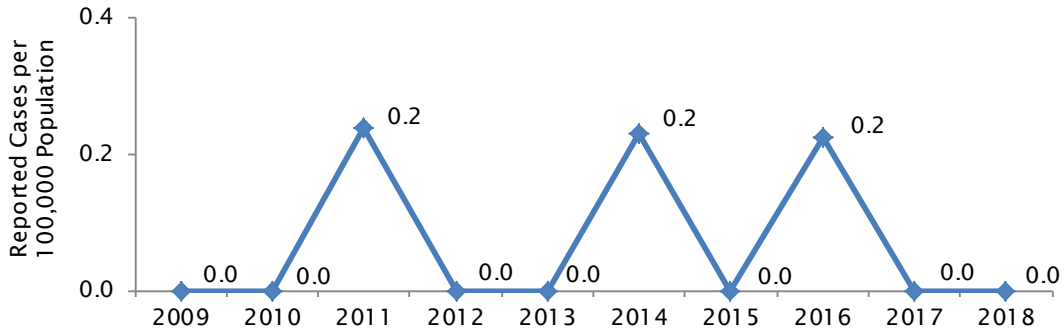
B. Relapsing Fever

Relapsing fever is caused by several species of spirochetes in the genus *Borrelia*. In tick-borne relapsing fever (TBRF) the pathogen is transmitted to humans via ticks in the family Argasidae. Rodents are the reservoirs for relapsing fever in North America. Locally, TBRF is caused by *Borrelia hermsii* and is seen occasionally in the Lake Tahoe basin. The tick vector is *Ornithodoros hermsi*. Outbreaks occur occasionally in limited areas of the western U.S. and Canada. Relapsing fever is reportable in Nevada but not nationally.

1. Reported Incidence

No cases of relapsing fever were reported in Washoe County in 2018.

Figure 3.2 Annual Rates of Reported Cases of Relapsing Fever, Washoe County, 2009 – 2018.



2. Population Affected

Zero cases of relapsing fever were reported in Washoe County in 2018.

C. Tick- Borne Disease Surveillance, Prevention and Control

VBDP staff will identify submitted ticks and test [via Indirect Flourescent Antibody (IFA)] for *Borrelia* spirochetes. In 2018 only one (1) Ixodes pacificus tick was tested by VBDP for *Borrelia* spirochetes and it was negative.

Results of all tick tests are summarized below.

Table 3.1 Summary of Ticks Identified in 2018.

Species	Common Name	# Identified
Ixodes pacificus	Western Deer Tick	1
Ixodes spp.		1
Dermacenter variabilis	Western Dog Tick	17
Dermacenter occidentalis	Pacific Coast Tick	1
Dermancenter andersoni	Rocky Mountain Wood Tick	2
Rhipicephalus sanguineus	Brown Dog Tick	2
Unable To Identify		1
Total		25

IV. Rabies

A. Human Rabies

Rabies in humans is a rare occurrence in the United States with an average of less than 5 cases per year. Worldwide, an estimated 30,000 to 50,000 deaths are due to rabies each year. In the U.S., rabies in domestic animals such as dogs, cats and cattle has declined dramatically since the 1950s. This decrease is mainly due to rabies vaccination programs and stray animal control by animal control agencies.

1. Reported Incidence

No human cases of rabies were reported in Washoe County in 2018.

2. Population Affected

No human cases of rabies were reported in Washoe County in 2018.

B. Animal Rabies

Eight bats tested positive for rabies in Washoe County in 2018. All rabies testing in Nevada is performed by the Animal Disease Lab using rabies fluorescent antibody.

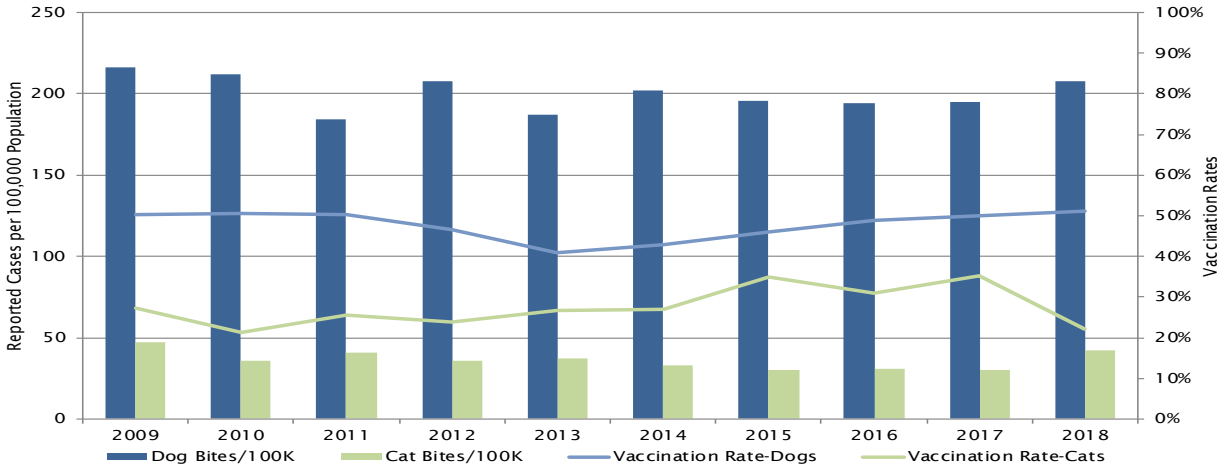
Table 4.1 Summary of Specimens Tested for Rabies, Washoe County, 2018.

Species (Common name)	# Positive	# Tested	% Positive
Bat (All species)	8	72	11.11%
Canine (Domestic)	0	97	0.00%
Caprine	0	1	0.00%
Coyote	0	1	0.00%
Equine	0	2	0.00%
Feline (Domestic)	0	27	0.00%
Mink	0	1	0.00%
Raccoon	0	11	0.00%
Rodent	0	2	0.00%
Skunk	0	2	0.00%
Squirrel	0	1	0.00%
Total	8	217	3.69%

C. Surveillance, Prevention and Control

Effective in 2008, all animal bite reports received by WCHD were directly entered into the Washoe County Animal Control Authority's (WCACA) database called "Chameleon" to ensure a timely investigation and appropriate quarantine procedures. The following data were reported by WCACA.

Figure 4.1 Animal Bite Incidence & Vaccination Status, Washoe County, 2009-2018.



*Vaccination Rates were calculated by: Number of animals with confirmed current rabies vaccination at time of bite incident/Total number of bite incidents

Table 4.3 Vaccination Status of Biting Animals, Washoe County, 2018.

Agency	Species	# Vaccinated	Total	% Vaccinated
Washoe County Regional Animal Control	Dogs	492	954	51%
	Cats	43	195	22%

V. Hantavirus

A. Hantavirus Pulmonary Syndrome (HPS)

In 1993, a respiratory illness caused by a previously unknown viral pathogen was described among residents of the southwestern U.S. Hantavirus Pulmonary Syndrome, as it was termed, was subsequently recognized throughout the contiguous U.S. and the Americas. The virus found to cause HPS was later identified and named Sin Nombre Virus (SNV). "Through January 2017, a total of 728 cases of HPS have been reported in 36 states of the United States. Thirty-six percent (36%) of all reported cases have resulted in death. More than 96% of reported cases have occurred in states west of the Mississippi River." (Special Pathogens Branch, Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, September 13, 2017)[1].

Hantavirus Pulmonary Syndrome (HPS)

a. Reported Incidence

No human cases of HPS were reported in Washoe County in 2018.

d. Population Affected

No human cases of HPS were reported in Washoe County in 2018.

B. Surveillance, Prevention and Control Activities

Hantavirus is endemic in Washoe County. Past surveillance has indicated that about 17% of Deer mice (*Peromyscus maniculatus*) are infected with Hantavirus in Washoe County. Because of wide distribution of Deer mice and the endemic nature of Hantavirus the best means of preventing infection is avoidance of mice and their droppings. Regular testing was discontinued beginning in 2013 in Washoe County.

[1] https://www.cdc.gov/hantavirus/surveillance/reporting-state.html

TECHNICAL NOTES

I. Data Sources & Data Providers

The following table lists data sources and data providers for this report.

Data Sources & Providers, WCHD Annual Communicable Disease Summary, 2018

Section of Report	Data Sources	Data Provider (Division/Program)
Enteric Diseases	NBS FBI Complaints Outbreak Inventory	EPHP - CD Program EHS - Food Safety Program ORT
Hepatitis	NBS Hepatitis B Surveillance Hepatitis C Surveillance WebIZ	EPHP - CD Program EPHP - CD Program EPHP - CD Program CCHS - Immunization Program
Other Reportable Diseases	NBS & CD Log	EPHP - CD Program
Sexually Transmitted Disease	STD*MIS & NBS eHARS/HIV CTS Data STIS & Patagonia	CCHS - STD Program CCHS - HIV/AIDS Program EPHP - CD Program & CCHS
Tuberculosis	Patagonia & NBS	CCHS - TB Program
Vaccine Preventable Diseases	NBS & CD log WebIZ	EPHP - CD Program CCHS - Immunization Program
Vector- Borne Diseases	NBS Vector Surveillance Data Chameleon	EPHP - CD Program EHS - Vector Program Washoe County Regional Animal Services

NBS=NEDSS (National Electronic Disease Surveillance System) Base System; FBI=Foodborne Illness; STD*MIS = Sexually Transmitted Diseases Management Information System; eHARS=Enhanced HIV/AIDS Reporting System; CTS=Counseling, Testing, and Services; STIS=Sexually Transmitted Infections Surveillance; EPHP=Division of Epidemiology & Public Health Preparedness; EHS=Division of Environmental Health Services; CCHS=Division of Clinical and Community Health Services; CD=Communicable Disease; ORT=Outbreak Response Team

II. Washoe County Population Data for 2018

The total population estimate for Washoe County was 459,054 for 2018. Population breakdown by demographic characteristics is described in the following table. Projection data was provided by the State Demographer via the Nevada Division of Public and Behavioral Health (NDPBH) in June 2019.

Population Estimates by Demographics, WCHD Annual Communicable Disease Summary, 2018

Gender	Male	230,782			<1	5,602
	Female	228,272			1-4	22,557
	Total	**459,054**			5-14	59,900
Race/Ethnicity	White, non-Hispanic	291,905			15-24	62,678
	Black, non-Hispanic	11,608			25-34	65,088
	Native American, non-Hispanic	7,351		**Age group**	35-44	58,143
	Asian, non-Hispanic	32,023			45-54	55,851
	Hispanic	116,167			55-64	58,870
	Total	**459,054**			65-74	44,507
					75-84	19,669
					85+	6,187
					Total	459,054

Denominators used in this report for the time period 2008-2017 were adjusted based on population estimates data for 2008-2017 provided by NDPBH in June 2018. Therefore, there were slight changes in the respective historical incidence rates in this report compared to those published previously.