



COMMUNICABLE DISEASE IN **MONTANA**

ANNUAL REPORT **2020**



MONTANA
COMMUNICABLE
DISEASE EPIDEMIOLOGY

Prepared by the Communicable Disease Epidemiology Section

Public Health and Safety Division

Montana Department of Public Health and Human Services

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This report was prepared by the Communicable Disease Epidemiology Section (CDEpi) at the Montana Department of Public Health and Human Services (DPHHS). It summarizes communicable diseases reported by the State of Montana in 2020. These reportable conditions met the 2020 case definitions provided by the Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE). Communicable diseases that must be reported by diagnostic laboratories and health care professionals to public health authorities are specified by the Administrative Rules of Montana (ARM 37.114.203). Communicable disease data are maintained in the Montana Infectious Disease Information System (MIDIS) and HIV data are maintained in the enhanced HIV/AIDS Reporting System (eHARS). Population data as well as reportable communicable disease statistics are found in Appendix I. Small numbers of reported cases may result in unstable rates and should be interpreted with caution. Please contact CDEpi at 406-444-0273 or hhsepi2@mt.gov with questions or comments.

Message from the State Medical Officer

The prevention and control of communicable disease is one of the most important aspects of public health practice in the United States and is necessary to ensure the health and well-being of Montana citizens.

As such, the Montana Department of Public Health and Human Services (DPHHS) works closely with local and tribal health jurisdictions who are on the front lines of public health to prevent communicable diseases in Montana.

Core public health activities include:

- *Responding to and tracking outbreaks of infectious diseases, such as influenza, foodborne and vectorborne illnesses, and newly emerging diseases, such as COVID-19*
- *Testing for and treating infectious diseases*
- *Preparing communities for disease outbreaks of all scales*
- *Providing education and key messaging to prevent transmission of disease*

The unique nature of this work requires staff to be 'on call' for disease reporting, consultation, and outbreak investigation to quickly respond to communicable disease urgencies and emergencies.

The Montana Communicable Disease Annual Report summarizes and highlights the diseases and outbreaks investigated by the DPHHS Communicable Disease and Epidemiology Section and local health jurisdictions and partners during 2020. Data trends and public health events of importance are described and analyzed in order to understand the impact of specific communicable diseases on the health of people living in Montana.

We thank the staff who, through the COVID-19 pandemic that began in early 2020, continue to invest immeasurable effort in preserving the health and safety of their communities by limiting the spread of communicable diseases and minimizing the associated negative health impacts.

Sincerely,



Maggie Cook-Shimanek, M.D., MPH

Acting State Medical Officer, DPHHS



Who We Are & What We Do

Preventing and controlling the spread of disease is the heart of public health work. In coordination with and support of local health agencies, the Communicable Disease Epidemiology Section (CDEpi) keeps that mission in mind as we work each day to improve and protect the health of all Montanans. CDEpi encompasses the following areas:

VACCINE PREVENTABLE DISEASES

Vaccine Preventable Disease Epidemiology monitors for diseases that are prevented by vaccination, and works to control the spread of these illnesses. This section works with the Immunization Program to promote the benefits of vaccination.

FOOD/WATERBORNE DISEASES AND OUTBREAKS

Food/Waterborne Diseases and Outbreak Epidemiology performs surveillance to detect food and waterborne diseases, and investigates those cases to identify and prevent outbreaks of enteric illnesses in Montana. In addition, case surveillance and investigation identify common risk factors which help guide prevention messaging and activities that aim to decrease the incidence of enteric diseases.

HIV AND HEPATITIS C

HIV and Hepatitis C Epidemiology works to identify new and existing HIV/AIDS cases and to use the data to identify trends in HIV occurrence and evaluate prevention interventions. As a serious public health concern, Hepatitis C surveillance is also an important function of the CDEpi unit. Surveillance for Hepatitis C is needed to direct and evaluate prevention and control activities.

TUBERCULOSIS CONTROL

Tuberculosis (TB) Control Epidemiology helps identify and manage new cases of TB and their contacts to make sure that appropriate testing and control measures are taking place. TB Control also manages the latent tuberculosis infection (LTBI) medication program and assists with refugee health.

VECTORBORNE AND ZONOTIC DISEASES

Vectorborne and Zoonotic Epidemiology monitors and provides assistance with investigating vectorborne diseases, such as those caused by ticks, mosquitoes, and animals.

HEALTHCARE-ASSOCIATED INFECTIONS (HAI)

Healthcare-Associated Infections Epidemiology manages the healthcare-associated infections program in Montana by monitoring outbreaks of HAI as well as education on infection prevention in healthcare settings and congregate settings. This program also has oversight of antibiotic stewardship programs in the state.

COMMUNICABLE DISEASE NURSE CONSULTANT

The Communicable Disease Nurse Consultant works with the epidemiologists to bring nursing considerations to reportable disease case investigation and management. The nurse also develops training for local health jurisdictions and assists local health jurisdictions with evaluation and management of potential rabies exposures.

MONTANA INFECTIOUS DISEASE INFORMATION SYSTEM (MIDIS)

Montana Infectious Disease Information System (MIDIS) Epidemiology maintains the surveillance database used for reportable communicable conditions in Montana. This database also transmits nationally reportable data to the Centers for Disease Control and Prevention (CDC). Epidemiologists use this database daily to investigate cases, monitor trends in diseases, and identify outbreaks.

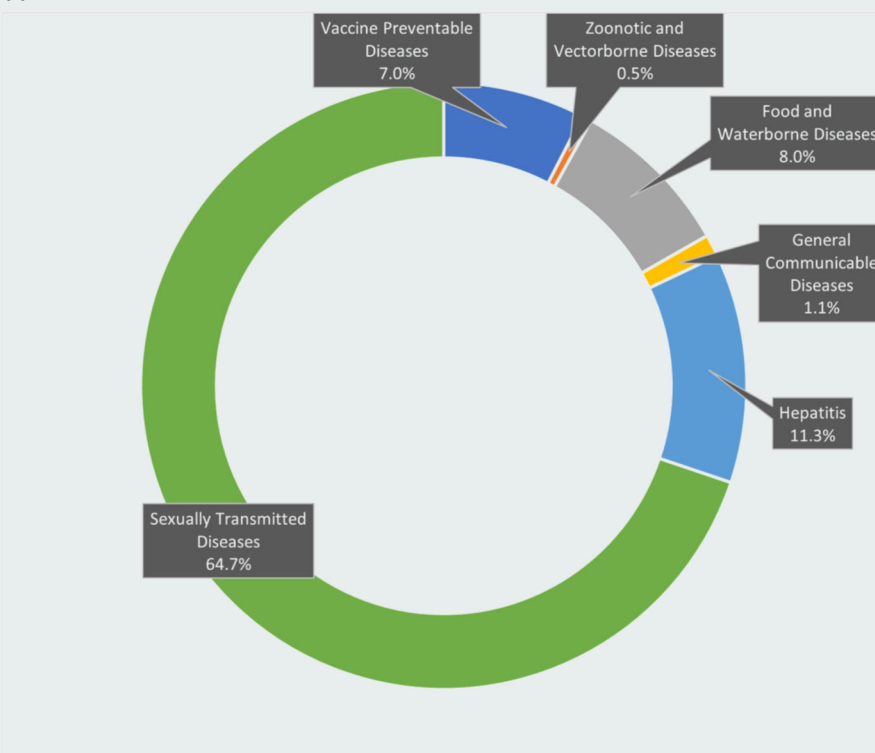
Preface

The 2020 Montana Communicable Disease Annual

Report contains data for notifiable diseases and conditions reported to Montana DPHHS in 2020. Data are collected from local public health jurisdictions, laboratories, healthcare providers, hospitals, and other healthcare facilities as described by the Administrative Rules of Montana (ARM) 37.114.201 (reporters). In 2020, Montana DPHHS tracked more than 8,000 non-COVID communicable disease cases. An additional 85,195 COVID-19 cases were reported in Montana in 2020. Each reported case is investigated by local health jurisdictions, and includes contact investigations and application of control measures to prevent further spread of disease. The distribution of reportable disease cases in 2020 is depicted in Figures 1 and 2.

The Notable Events section presents information on noteworthy reports from 2020 for selected diseases that were above expected values or were newly emerging. Incidence and historical five-year medians are presented in Appendix I. In addition, the Montana Demographic Profile is presented in Appendix II. Cases are counted

FIGURE 1. REPORTED NON-COVID COMMUNICABLE DISEASES BY CATEGORY, MONTANA, 2020



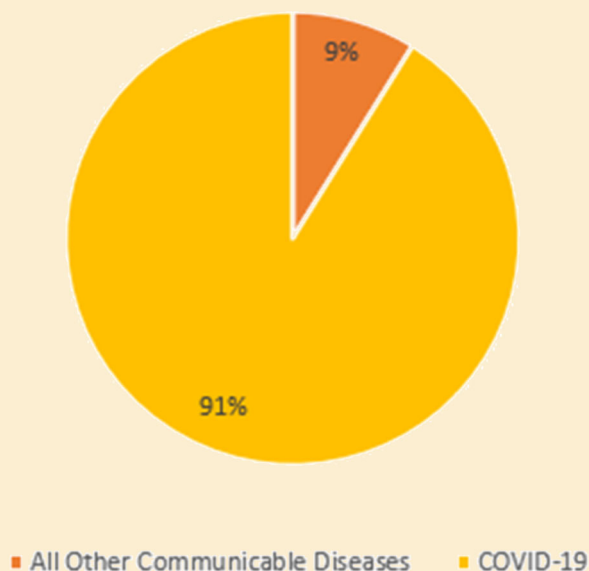
by the week and year in which they occurred as determined by the Morbidity and Mortality Weekly Report (MMWR) assigned by the CDC.

Notable Events 2020

Emergence of the COVID-19 Pandemic

The CDC was first notified about a new type of coronavirus circulating in Wuhan, China, in January of 2020. This newly identified coronavirus was ultimately named COVID-19 and resulted in a pandemic classification and response. Nearly 20 million cases of COVID-19 were identified in the United States by the end of 2020, with over 350,000 cases resulting in a death. Montana identified its first case of COVID-19 on March 13, 2020. By the end of 2020, over 85,000 cases of COVID-19 were identified in Montana residents, with over 4,000 cases necessitating hospitalization and almost 1,500 cases resulting in death.

FIGURE 2. CASES OF REPORTED COMMUNICABLE DISEASE, COVID VS. OTHER REPORTABLE DISEASES, MONTANA 2020





Salmonella Newport Outbreak in Onions

Between June and October 2020 an outbreak of *Salmonella* caused a total of 1,127 reported infections in people from 48 states, including Montana. MT reported 72 cases linked to the outbreak. The cases of *Salmonella* were all infected with a specific strain, or serotype, called *Salmonella* Newport. The Food and Drug Administration (FDA), CDC, and state and local partners worked together to link the cases to whole red onions supplied by Thomson International Inc. in Bakersfield and in Holtville, California.

A conclusive cause of the contaminated onions could not be found. There were, however, several potential factors contributing to the 2020 red onion outbreak including the leading hypothesis that contaminated irrigation water was used in a growing field in Holtville. Other types of onions (such as yellow, white, or sweet yellow) were also suspected to have been contaminated as the onions were grown and harvested together.

Thomson International Inc. cooperated with the FDA throughout the investigation and continued to engage with the FDA on the agency's findings and recommendations. As a result of the investigation, all types of onions grown by the company were recalled.

Increase in Congenital Syphilis Cases

Congenital syphilis, a disease that occurs in babies who are infected from their mother during pregnancy, has been dramatically increasing since 2012 with the U.S. seeing a sharp 15% rise in congenital syphilis cases between 2019 and 2020.

Syphilis infections can cause miscarriages, stillbirths, prematurity, low birth weight, or death shortly after birth. Babies born with congenital syphilis can also have deformed bones, severe anemia, an enlarged liver and spleen, brain and nerve problems, along with other serious conditions.

Congenital syphilis can be avoided with timely detection and treatment. There are many opportunities to prevent congenital syphilis if women receive appropriate prenatal care. Some women with positive syphilis screening tests have to be referred to another healthcare setting to get effective treatment, but may be lost in the private or public healthcare systems and are thus never treated. Other women may test negative in the first trimester of pregnancy, but go on to acquire syphilis later in pregnancy.

CP-CRO

In 2020, the Healthcare-associated Infections (HAI) program continued monitoring for multidrug-resistant organisms (MDROs) of concern, including Carbapenem-Resistant Organisms (CROs). One carbapenemase producer (CP-CRO) was identified in 2020. CROs that produce carbapenemases, enzymes that break down the antibiotic class of carbapenems, are considered CP-CROs. The carbapenemase gene can be easily shared between bacteria, leading to the rapid spread of resistance. In specific, the carbapenemase gene detected in 2020 was New Delhi Metallo-beta-lactamase (NDM). This was the third case of a CP-CRO identified in Montana since the first case was identified in 2019.



COVID-19

COVID-19 is a very contagious disease that was discovered in December 2019 in Wuhan, China. COVID-19 is caused by the SARS-CoV-2 virus, also referred to as the 2019 Novel Coronavirus. This virus is part of the coronavirus family, which includes common viruses that cause a variety of diseases. Occasionally, this family of virus can cause more severe and rare diseases such as severe acute respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS), and COVID-19. Symptoms of this virus include fever, chills, cough, shortness of breath, sore throat, congestion, and headache. Similar to other respiratory viruses, coronaviruses spread quickly through droplets that are secreted when someone breathes, coughs, sneezes, or speaks.

COVID-19 was first identified in a Montana resident on March 13, 2020. However, this patient was not in Montana during the time of infection. COVID-19 was first identified in a resident who was physically in Montana on March 17, 2020. Montana reported 85,195 cases of COVID-19 in 2020.

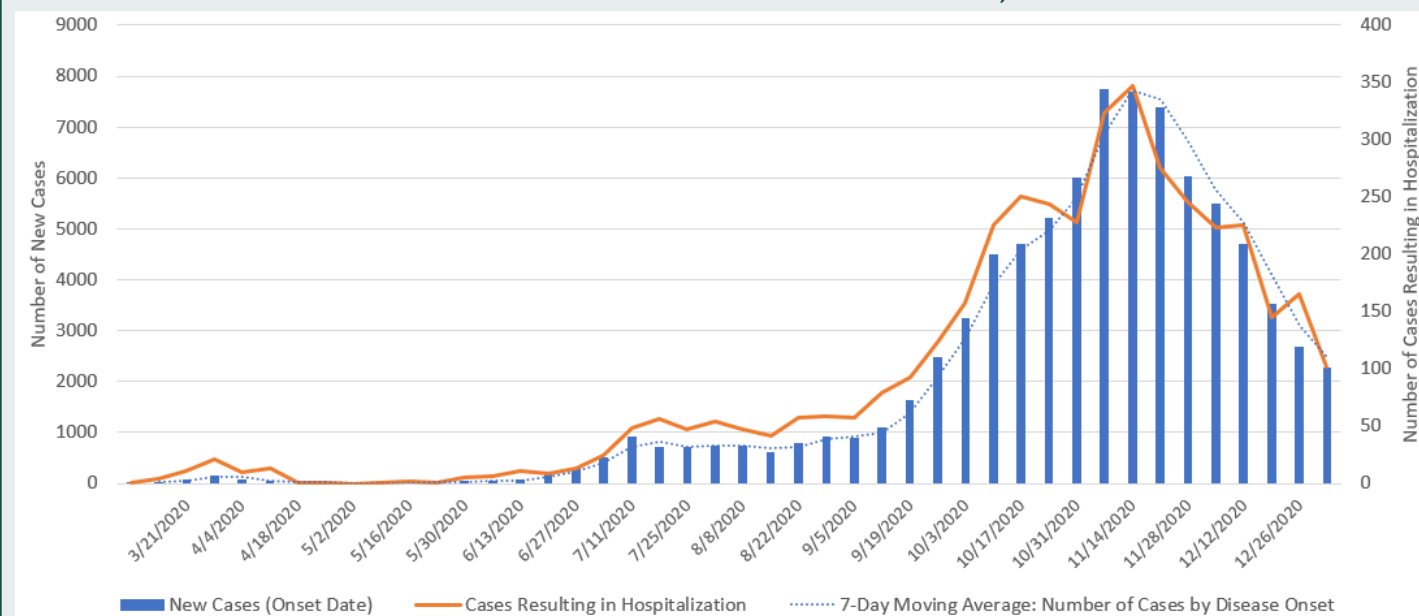
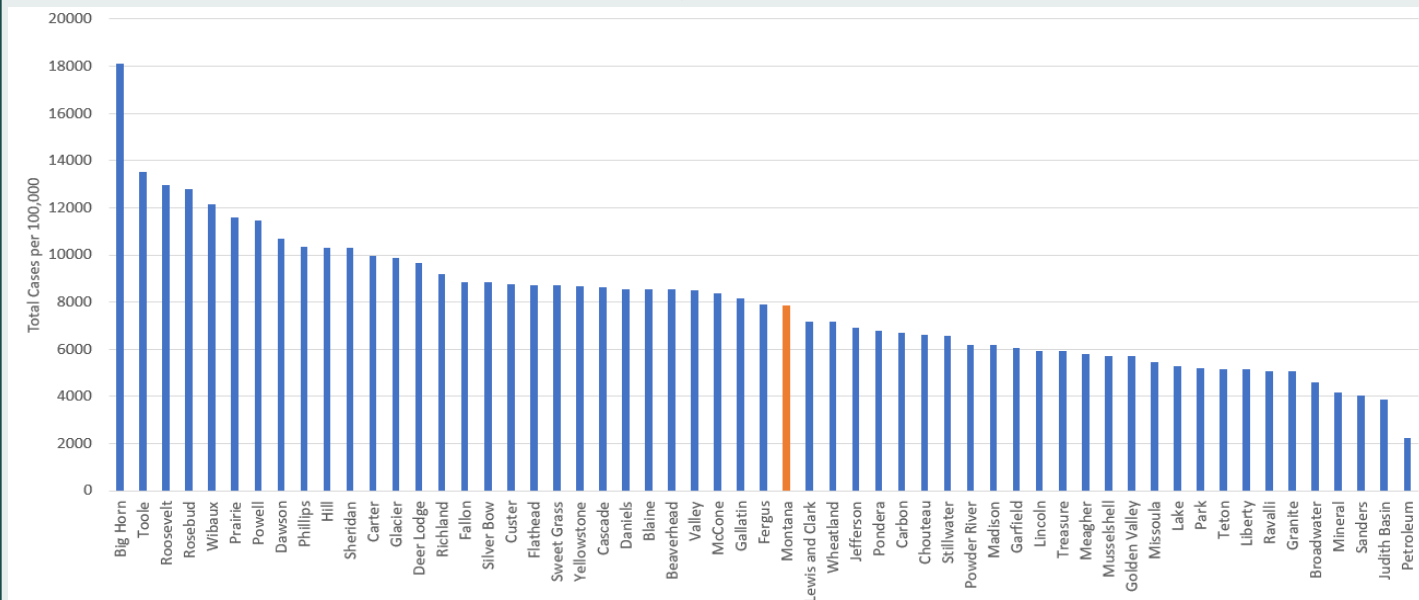
Genetic changes of viruses occur over time, resulting in what are called "variants" of the virus. Montana's State Public Health Laboratory (MTPHL) began sequencing for COVID-19 variants in December of 2020, shortly after the B.1.1.7 variant was detected in North America. Eighteen COVID-19 specimens were sequenced and reported to the GISAID database in 2020 for Montana residents.



TABLE 1. CHARACTERISTICS OF CASES AND DEATHS OF COVID-19, MONTANA 2020

Characteristics	Cases (N=85,195)	Hospitalizations (N=4,051)	Deaths (N=1,443)
Sex			
Male	40,444	2,168	793
Female	44,731	1,883	649
Unknown/Other	20	0	1
Age at diagnosis			
0-9	3,675	44†	21‡
10-19	9,448		
20-29	15,626		
30-39	13,700		
40-49	11,577	296	35
50-59	11,509	528	107
60-69	10,010	876	205
70-79	5,867	1,060	380
80+	3,783	981	695
Race			
American Indian Alaskan Native	8,595	587	284
White	53,881	2,915	1,053
Other	4,607	198	97
Unknown	18,112	351	9
† Hospitalizations for individuals aged 0-19 are reported in aggregate to ensure patient confidentiality			
‡ Deaths for individuals aged 0-39 years are reported in aggregate to ensure patient confidentiality			

- Of the 85,195 cases of COVID-19 that occurred in 2020, 4,051 (4.8%) resulted in hospitalization and 1,443 (1.7%) resulted in death.
- In 2020, males had a case fatality rate (CFR) of 2%; females had a CFR of 1.5%.
- Individuals aged 80+ had a CFR of 18.4%, the highest rate observed among all age groups.
- American Indian/Alaskan Native individuals had a CFR of 3.3%, compared to 2.0% and 2.1% observed in white and other racial groups, respectively.

FIGURE 3. COVID-19 CASES AND HOSPITALIZATIONS BY DATE OF DISEASE ONSET, MONTANA 2020**FIGURE 4. COVID-19 CASE INCIDENCE RATE BY COUNTY, MONTANA 2020**

Montana Response Dashboard

[MONTANA RESPONSE: COVID-19 - Coronavirus - Global, National, and State Information Resources \(arcgis.com\)](#)

[Demographic Tables](#)

[Demographic Information for COVID Cases, Montana](#)

[COVID-19 DPHHS Central Page](#)

[Coronavirus \(mt.gov\)](#)



Foodborne and Diarrheal Diseases



Enteric illnesses are most often reported during spring and summer months. Of note, incidence of campylobacteriosis in Montana has decreased for the second time in five years (Figure 5). In addition, the incidence of salmonellosis increased to the highest rate since 2015 (Figure 5). Much of this increase can be attributed to a large multi state outbreak of *Salmonella* Newport—Montana reported 72 cases that were part of that outbreak.

TABLE 2. ENTERIC ILLNESSES IN MONTANA, 2020

Condition	Cases	2020 Incidence (per 100,000)	2015-2019 Incidence (per 100,000)
Campylobacteriosis	300	27.8	36.2
Salmonellosis	190	17.6	14.9
Shiga-toxin producing <i>E.coli</i> (STEC)	92	8.5	9.6
Giardiasis	76	7.0	9.7
Cryptosporidiosis	48	4.4	6.1
Shigellosis	15	1.4	1.1

CAMPYLOBACTERIOSIS

Campylobacteriosis is a diarrheal illness caused by the bacteria *Campylobacter*. The incidence of campylobacteriosis in Montana was 27.8 cases per 100,000 population in 2020, which is 39% higher than the national average of 20 cases per 100,000 population. Common sources of transmission of the bacteria include exposure to cattle or live poultry, and consumption of raw milk, untreated water, and undercooked foods such as chicken. Exposure to cattle or live poultry was reported in 29% of campylobacteriosis cases in Montana in 2020.

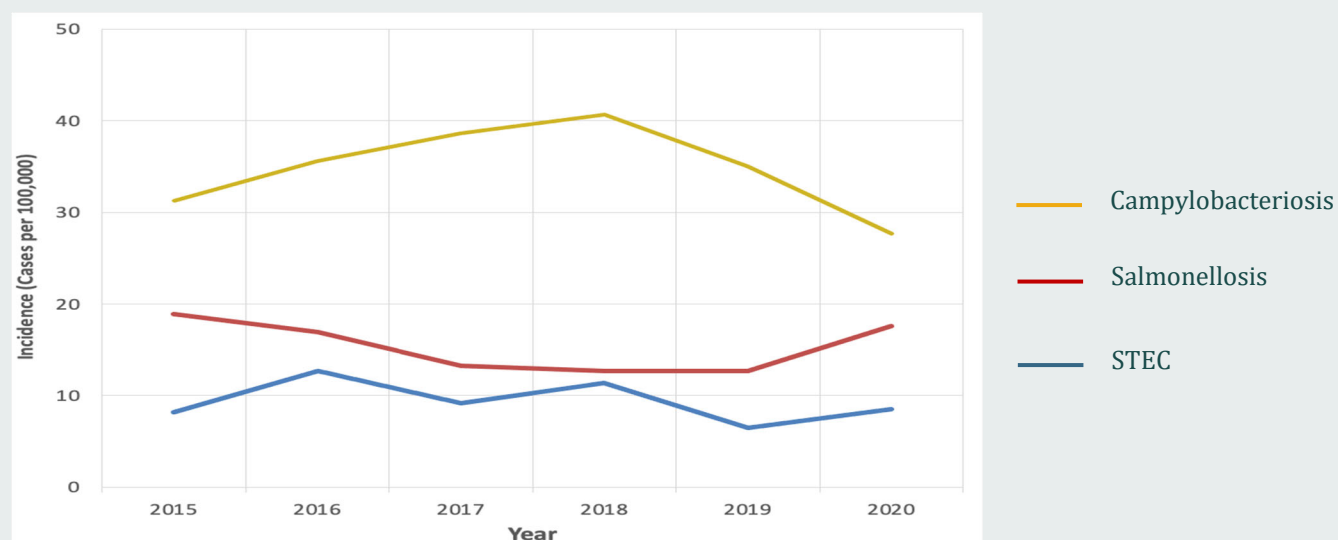
SALMONELLOSIS

Salmonellosis is an enteric disease caused by the bacteria *Salmonella*, and is characterized by a sudden onset of diarrhea, abdominal pain, fever, and nausea. In 2020, 190 cases of salmonellosis were reported in Montana. The incidence of *Salmonella* cases in 2020 was 17.6 per

100,000 population, which is an increase from 2019, and is also higher than the five-year average of 14.9 salmonellosis cases per 100,000 population between 2015 and 2019. Common risk factors for *Salmonella* infection include exposure to live poultry and ingestion of contaminated food. In 2020, 112 (59%) of Montana's salmonellosis cases were linked to one of three outbreaks—two were multi-state outbreaks (one linked to onions and one to contact with live poultry) and one was a Montana-specific outbreak linked to a correctional facility.

SHIGA-TOXIN PRODUCING *E. COLI* (STEC)

STEC is an enteric disease characterized by abdominal pain and diarrhea that is often bloody; it can cause severe illness in humans. There were 92 cases of STEC reported in 2020 in Montana. Cattle are a common reservoir for STEC bacteria and are a primary source of infection in Montana. Consumption of undercooked beef and other contaminated foods are also risk factors for illness. Nineteen cases (21%) reported in 2020 were hospitalized. There were zero reported cases of hemolytic uremic syndrome (HUS), a rare but serious kidney disease that can result from STEC infection, in Montana in 2020.

FIGURE 5. SELECT ENTERIC ILLNESS RATES OVER TIME—MONTANA, 2015-2020

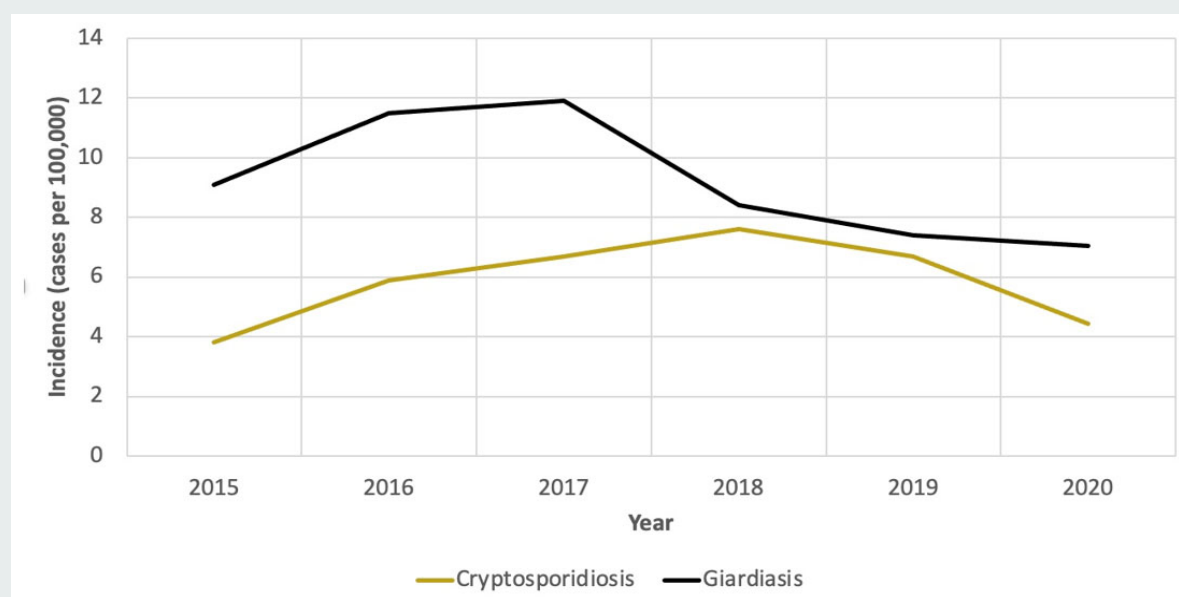
CRYPTOSPORIDIOSIS AND GIARDIASIS

Giardia and *Cryptosporidium* are parasites that cause giardiasis and cryptosporidiosis infections, respectively, and are often associated with waterborne exposures including swimming in recreational waters and ingesting untreated drinking water. In 2020, there were 76 cases of giardiasis and 48 cases of cryptosporidiosis reported in Montana. Of those, 24% drank untreated water and 29% had recreational water exposure prior to illness onset. The incidence rate of giardiasis decreased for the third time since 2017, and the 2020 incidence of 7.0 cases per 100,000 population is lower than the five-year average incidence of 9.7 cases per 100,000 population. The incidence of cryptosporidiosis has fluctuated over the past five years, but has now decreased for two years in a row.

TABLE 3. CHARACTERISTICS OF CASES OF CAMPYLOBACTERIOSIS, MONTANA 2020

Characteristics	Number
Sex	
Male	162
Female	137
Unknown	1
Age at diagnosis (years)²	
0-4	18
5-9	17
10-19	21
20-29	41
30-39	45
40-49	33
50-59	32
60-69	44
70-79	32
80+	17
Ethnicity	
Not Hispanic or Latino	225
Unknown	67
Hispanic or Latino	8



FIGURE 6. SELECT PARASITIC ILLNESS RATES OVER TIME—MONTANA, 2015-2020

SHIGELLOSIS

Shigellosis is a bacterial illness caused by *Shigella*, and the only significant reservoir is humans. In 2020, 15 cases of shigellosis were reported (1.4 per 100,000), which is about average for a non-outbreak year in Montana. This pathogen is transmitted via the fecal-oral route, and those most at risk of infection are young children, travelers to developing countries, men who have sex with men, and individuals with weakened immune systems.

LISTERIOSIS

Listeriosis is a serious bacterial infection caused by eating food contaminated with *Listeria monocytogenes*. Pregnant women and their newborns, adults aged 65 and older, and people with weakened immune systems are most likely to develop illness. In Montana, an average of one case per year is reported. There were two cases of listeriosis reported in 2020; one case was hospitalized due to the infection.

VIBRIOSIS

Vibriosis is an enteric illness caused by many different species of *Vibrio*, most often *Vibrio parahaemolyticus* and non-toxigenic *V. cholerae*. Vibriosis infections occur after consuming raw or undercooked seafood (most often oysters), or exposing a wound to seawater (in Montana, this occurs when cases travel to coastal areas). Most infections occur from May through October when water temperatures rise and *Vibrio* species thrive. There were three cases of vibriosis reported in Montana in 2020. Of the 2020 cases, two ate oysters and one consumed shellfish.

BOTULISM

Botulism is a rare but serious illness caused by a toxin produced by *Clostridium botulinum*. The toxin attacks the body's nerves and causes difficulty breathing, muscle

paralysis, and sometimes death. In Montana, an average of less than one case is reported per year. There were no botulism cases reported in 2020.

TYPHOID FEVER

Typhoid fever is a serious disease caused by *Salmonella* serotype Typhi. Most cases of typhoid fever in the United States become infected through international travel. Montana has an average of less than one case per year. In 2020, there were no reported cases of typhoid fever.

ENTERIC OUTBREAKS

Montana reported 14 enteric illness outbreaks in 2020 that sickened 288 people. Of those, there were 14 hospitalizations and two deaths. Of the 14 enteric outbreaks, 6 (43%) were caused by norovirus, the most common cause of enteric disease outbreaks. While it is not reportable in Montana on an individual case level, outbreaks of norovirus are reportable. *Salmonella* was also a major contributor to outbreaks in 2020: it caused three of the 14 outbreaks (21%) and 112 of the 288 illnesses (39%). The *Salmonella* outbreaks were linked to a multi-state live poultry outbreak, a multi-state outbreak linked to onions, and an in-state outbreak associated with a correctional facility.

2020 was an atypical year for outbreak investigations in Montana. Prior to 2020, the five-year average for enteric disease outbreaks was 39 outbreaks a year (compared to the 14 enteric illness outbreaks reported in 2020). The emergence of the COVID-19 pandemic meant that daily life was changed in many ways. Many people ate out less, travelled less, and spent less time in close proximity with others in public. These are all likely contributing factors that led to the decrease of reported enteric disease outbreaks in 2020.

Vaccine Preventable Disease

Some of the most common vaccine preventable diseases (VPD), excluding COVID-19, tracked by the World Health Organization (WHO) include diphtheria, *Haemophilus influenzae* serotype B, hepatitis B, measles, meningococcal disease, mumps, pertussis, polio, rubella, tetanus, and yellow fever.³ Many of these conditions are rarely reported in Montana (see Appendix I). On average, VPDs, excluding COVID-19, comprise approximately 7% of reportable disease cases in Montana. The most frequently reported non-COVID VPDs in Montana in 2020 were pertussis and varicella (chickenpox).



PERTUSSIS

Pertussis, also known as whooping cough, is a highly contagious respiratory disease caused by *Bordetella pertussis*, and is characterized by extended periods of uncontrollable coughing followed by a characteristic inspiratory 'whoop'. The number of reported pertussis cases varies from year to year. In Montana, peaks occurred in 2005 and 2013, when 586 and 663 pertussis cases were reported, respectively. Following the peak in 2013, the number of reported cases of pertussis steadily declined through 2016. However, 2019 showed a significant increase with 494 cases reported. This is 3.5 times higher than the number of reported cases in 2018

(143). In 2020 Montana reported 40 pertussis cases, with an incidence of 3.7 cases per 100,000 population, compared to the US incidence of 1.6 cases per 100,000 population.

The median age of pertussis cases in Montana was 14 years (range: <1 – 85 years). None of the cases were hospitalized. No people with pertussis in 2020 died. Of those <18 years with documented immunization status (n=28), 75% had a history of pertussis containing vaccine.

FIGURE 7. REPORTED PERTUSSIS CASES — MONTANA, 2000-2020



VARICELLA

Varicella-zoster virus is the causative agent of chickenpox. Over the past 13 years, the number of varicella cases reported in Montana has declined from a peak of 437 cases in 2007 to 33 cases in 2020 (Figure 8), largely due to the implementation of varicella vaccination. Of the 33 cases reported in 2020, 24% (8) were children less than one year of age who were too young to receive vaccine. The median age of cases was five years (range: <1 month – 48 years). Of the 16 cases less than 18 years old who were eligible for vaccine and had vaccination status available, 56% had not received a varicella vaccination.

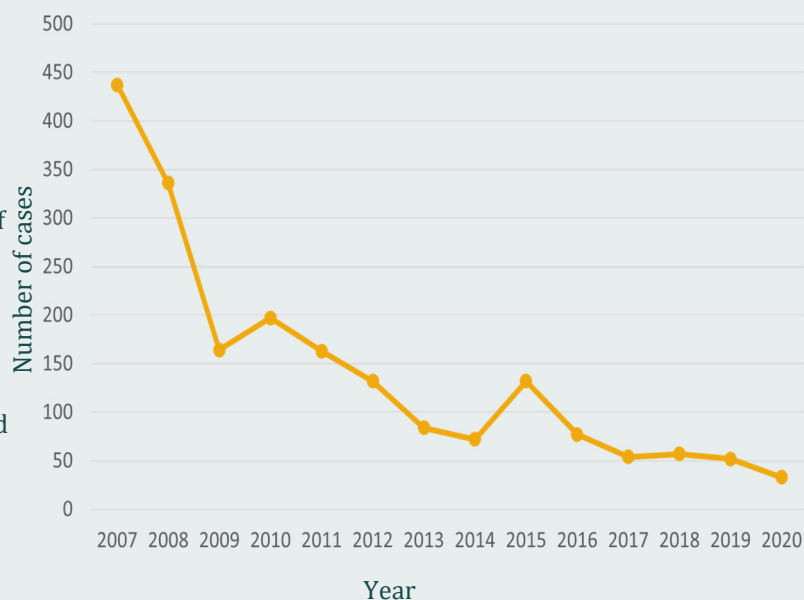
MUMPS

Mumps is an acute infection caused by a paramyxovirus and characterized by fever, swelling, and tenderness of the salivary glands (parotitis). Once a common childhood disease, incidence of mumps has steadily declined since the introduction of the measles, mumps, and rubella (MMR) vaccine.

On average, one to three cases of mumps are reported per year in Montana and typically are associated with international travel. However, in recent years numbers have been increasing in the United States and have been associated with several outbreaks on college campuses. An increase has been noted in recent years in Montana as well, with 26 cases reported linked to an outbreak in 2016 and six cases reported during each year in 2017 and 2018, although most were in non-college-aged individuals.

In 2020, only 1 case of mumps was reported, dropping from 17 cases in 2019. The low number of mumps cases reported in 2020 could be a factor of the COVID-19 pandemic.

FIGURE 8. REPORTED VARICELLA CASES — MONTANA, 2007–2020



INFLUENZA

Seasonal influenza (flu) is a respiratory illness caused by influenza viruses (types A and B) that can result in serious complications, including hospitalization and death. The flu season typically extends from October through May in Montana. During an average influenza season, the number of reported cases often peaks around January. During the 2020-2021 influenza season, there were no lab-confirmed influenza cases reported in Montana. Specimen testing began in October of 2020. Peak testing activity occurred during January 2021. Season totals include 21,231 specimens tested, 0 lab-confirmed cases, 0 hospitalizations, and 0 deaths attributed to influenza.

Emergency department and outpatient visits for influenza-like illness averaged <1% during the 2020-2021 season. The prevention measures taken to reduce COVID-19 transmission, such as masks and social distancing, are likely to have helped prevent the transmission of influenza as well.

The U.S. Outpatient Surveillance Network (ILINet) is a national system that conducts surveillance for influenza-like illness (ILI) in outpatient healthcare

facilities. The standard definition of ILI includes a fever, a cough, and/or a sore throat. Currently, 32 facilities participate in ILINet in Montana.

Figure 10 below shows the proportion of medical visits with a chief complaint of ILI each week, compared with recent seasons. For the 2020-2021 influenza season, the percentage of patient visits due to ILI in Montana rarely reached above 1% of emergency room visits.

FIGURE 10. PERCENTAGE OF ED VISITS FOR CHIEF COMPLAINT OF ILI BY INFLUENZA SEASON—MONTANA, 2016-2017 TO 2020-2021 INFLUENZA SEASONS

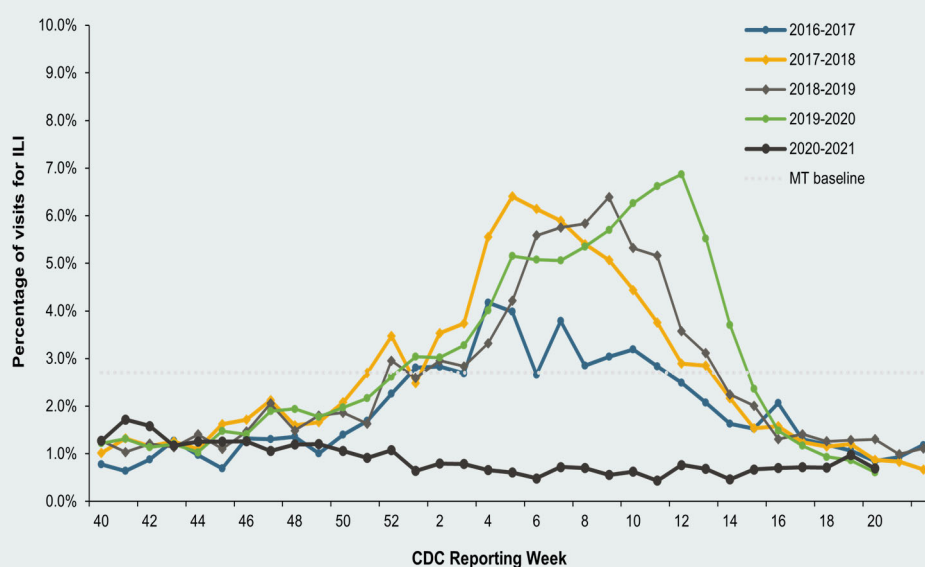
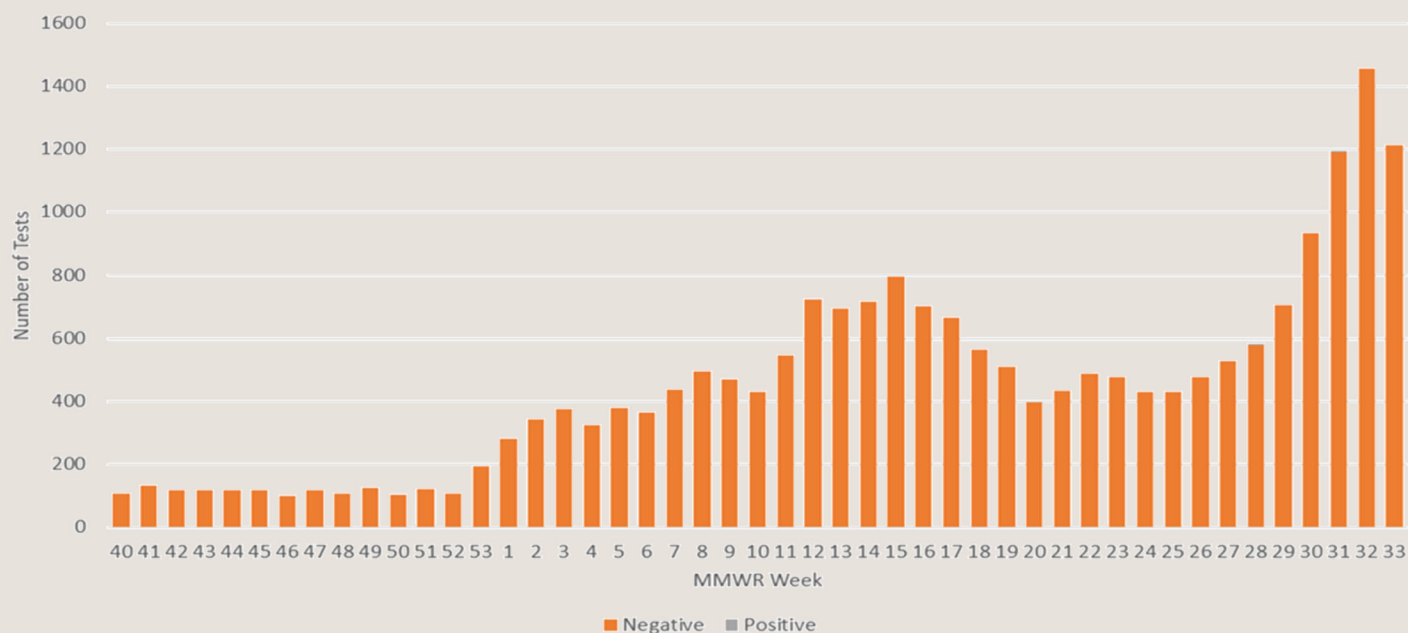


FIGURE 9. INFLUENZA TESTS PERFORMED BY CLINICAL LABORATORIES BY WEEK—MONTANA, 2020-2021 SEASON





Select Bacterial Invasive Diseases

Invasive diseases occur when bacteria invade parts of the body that are considered normally sterile sites (e.g., blood, cerebral spinal fluid, etc.). For example, pneumococcal bacteria can invade the bloodstream, causing bacteremia, or the tissues and fluids covering the brain and spinal cord, causing meningitis. When this happens, disease is usually very severe, requiring treatment in a hospital and in some cases, death. Many invasive diseases are preventable by vaccination.

MENINGOCOCCAL DISEASE

Meningococcal disease is caused by the gram-negative bacterium *Neisseria meningitidis*. The bacteria reside primarily in humans on the surface of mucosal membranes such as those found in the respiratory tract. Occasionally, *N. meningitidis* invades the human bloodstream, and may cross the blood-brain barrier, causing serious disease including meningitis and septicemia. There are 13 serotypes of *N. meningitidis*; 5 cause the most disease worldwide (A, B, C, W, Y). The most common serotypes isolated in the United States are B, C, and Y. There are vaccines available to protect against these serotypes. In 2020, zero meningococcal disease cases were reported in Montana.

STREPTOCOCCUS PNEUMONIAE

Pneumococcal disease is an infection caused by *Streptococcus pneumoniae* bacteria. In 2020, 84 cases (7.9 per 100,000 population) of invasive *Streptococcus pneumoniae* were reported in Montana. The median age of patients was 64 years (range: <1 – 93 years).

HAEMOPHILUS INFLUENZAE

Thirteen cases of invasive *Haemophilus influenzae* were reported (1.2 per 100,000 population) in 2020. All of the cases were in those older than 5 years of age. Most cases were non-typeable. One case of invasive *H. influenzae* type B, the type that is vaccine preventable, was reported.

OTHER INVASIVE DISEASES

Streptococcal toxic shock syndrome (STSS) is an invasive bacterial disease caused by group A *Streptococcus*. This syndrome can develop in up to one third of invasive group A *Streptococcus* infections, and it causes multiple organs to fail which can lead to death. Zero cases of streptococcal toxic shock syndrome were reported in 2020.

Sexually Transmitted Infections

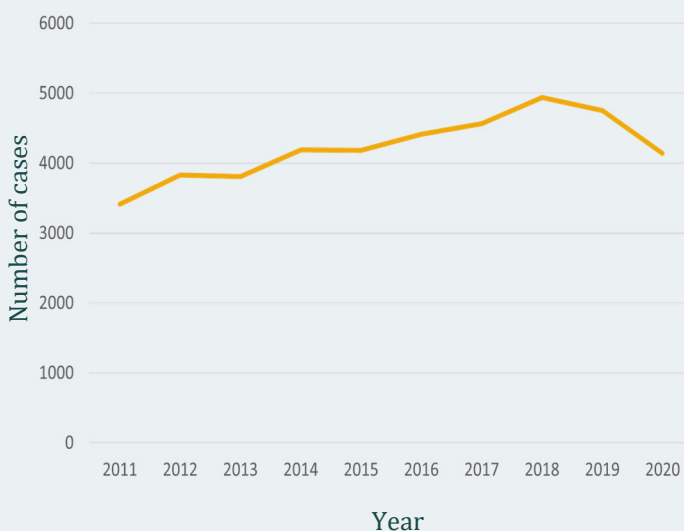
Sexually transmitted infections (STIs) continue to be some of the most frequently reported communicable diseases in Montana. There were 4,138 cases of chlamydia alone reported in 2020. Of all Montana counties, 90% of them reported at least one STI case.

CHLAMYDIA

Chlamydia is caused by the bacterium *Chlamydia trachomatis* and was the second most commonly reported communicable disease in Montana and the United States in 2020. *Chlamydia* infections are usually asymptomatic and may go unnoticed. In women, it can result in pelvic inflammatory disease (PID), a major cause of infertility, ectopic pregnancy, and chronic pelvic pain. *Chlamydia* infection can also facilitate the transmission of HIV⁴. Pregnant women infected with chlamydia can pass the infection to their infants during delivery, potentially resulting in neonatal ophthalmia or pneumonia. Given the large burden of disease and risks associated with infection, CDC recommends annual chlamydia screening for all sexually active women aged less than 25 years, women 25 years and older with risk factors, and all women during pregnancy.

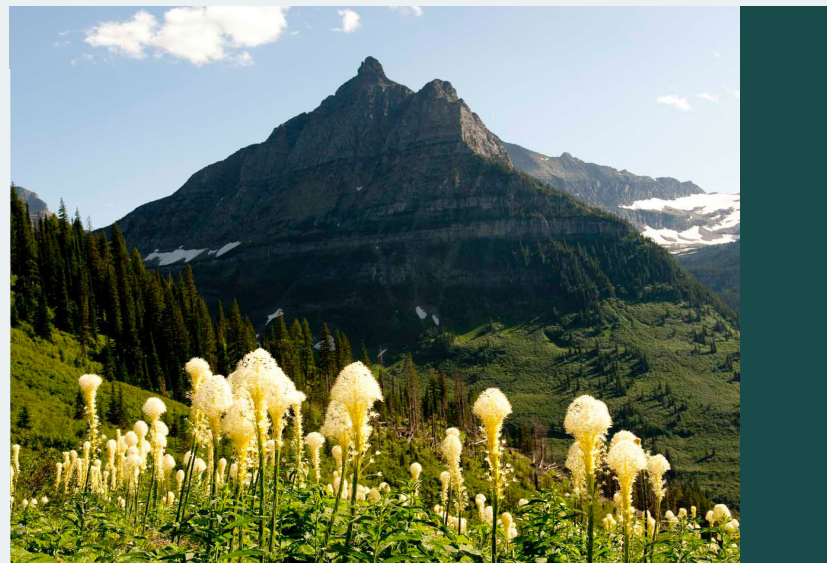
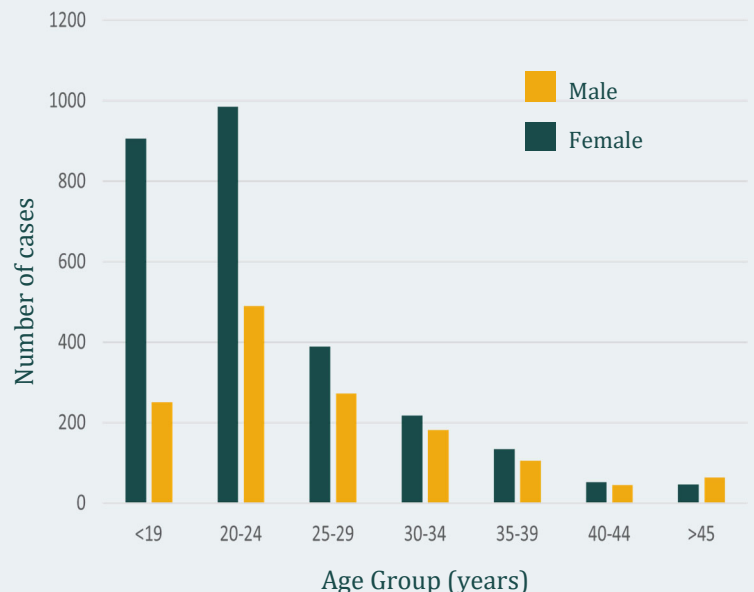
Since 2012, case rates for chlamydia have generally increased in Montana but starting in 2018 and into 2020 there has been a downward trend (Figure 11). In 2020,

FIGURE 11. CHLAMYDIA CASES — MONTANA, 2012-2020



there were 382.9 chlamydia cases per 100,000 population in Montana, compared to 481.3 cases per 100,000 population for the US. It is possible that the decreased number of cases in 2020 may be due to lower testing and uptake of healthcare services as a result of the COVID-19 pandemic. In 2020, 2,729 chlamydia cases (66%) were reported in females. The greater proportion of cases among females may be attributed to screening recommendations for females, resulting in females seeking medical care at greater rates than males, and therefore being tested more often. More chlamydia cases were diagnosed among persons aged 20–24 years (36%) than any other age group (Figure 12).

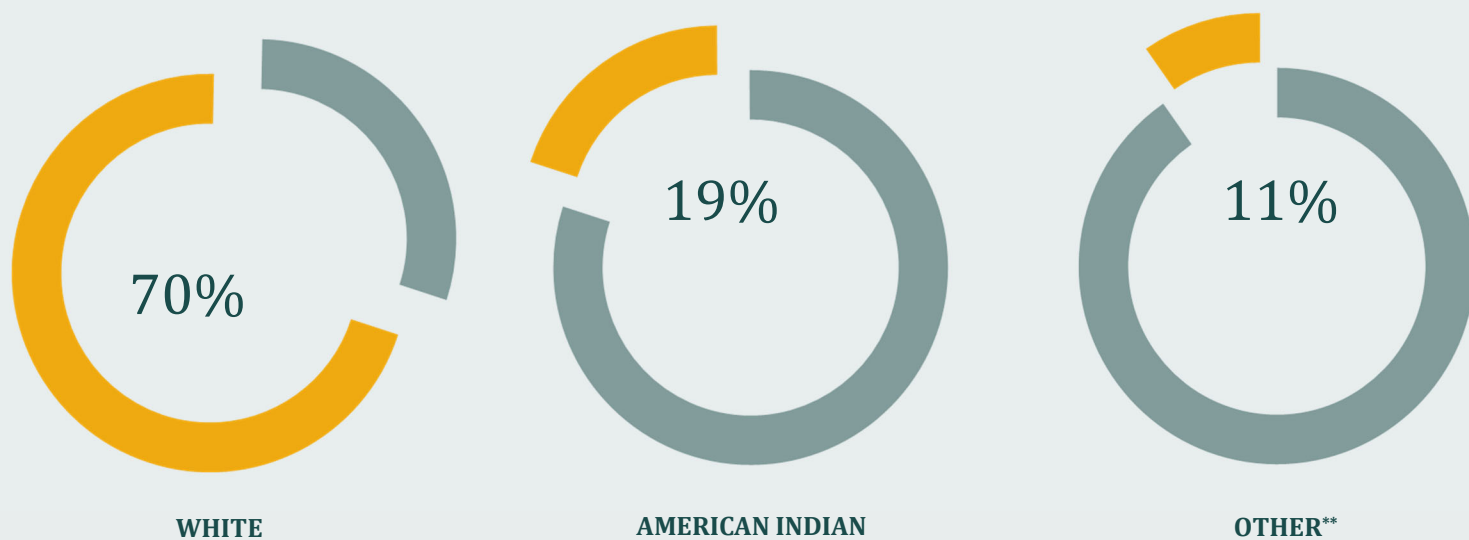
FIGURE 12. CHLAMYDIA CASES BY SEX AND AGE — MONTANA, 2020





In 2020, despite only accounting for 6.7% of the Montana population, American Indians made up 20% of the chlamydia cases in the state (Figure 13). Broader STI screening efforts among American Indians seeking services at Indian Health Services and tribal clinics may contribute to the higher reported chlamydia incidence in this population.

FIGURE 13. CHLAMYDIA CASES BY RACE*—MONTANA, 2020



* Race classification is irrespective of ethnicity (Hispanic or non-Hispanic)

** Other includes persons of more than one race, Black or African American, and Asian/Pacific Islander, or unknown



GONORRHEA

Gonorrhea is an infection caused by the bacterium *Neisseria gonorrhoeae*. It was the second most commonly reported STI in Montana in 2020. Incidence has been dramatically increasing over the last six years (Figure 14). Gonorrhea infections are a major cause of pelvic inflammatory disease (PID). In addition, epidemiologic and biologic studies provide strong evidence that gonococcal infections facilitate the transmission of HIV⁴.

In 2020, 1,696 gonorrhea cases were reported to DPHHS. This is a 8% increase from 2019 (1,571). Despite recent increases, the incidence of gonorrhea in Montana is lower (157.0/100,000) than the incidence in the U.S. (206.5/100,000).

In Montana, American Indians are disproportionately impacted by gonorrhea. In 2020, 36% of gonorrhea cases in Montana were American Indian (Figure 15). Broader STI screening efforts among American Indians seeking services at Indian Health Services (IHS) and tribal clinics may contribute to the higher incidence rate in this population. Increased screening and efforts to identify and test contacts can lead to increased case finding.

FIGURE 14. GONORRHEA INCIDENCE — MONTANA VS US, 2011-2020

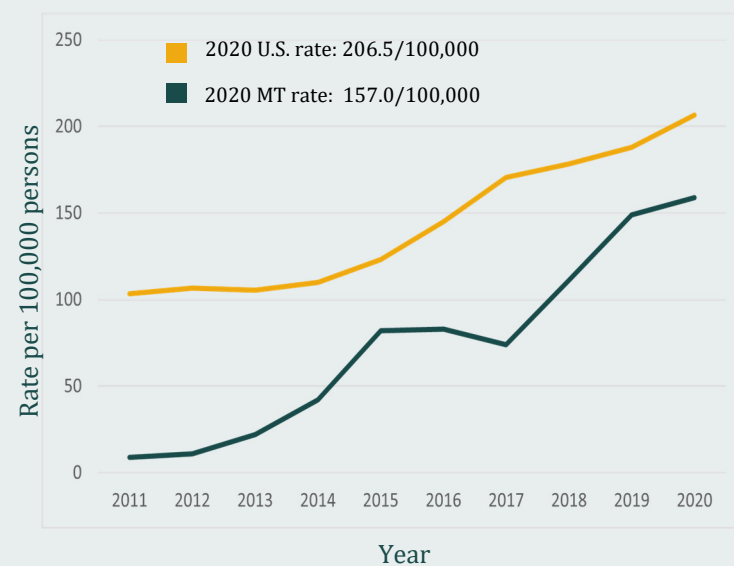
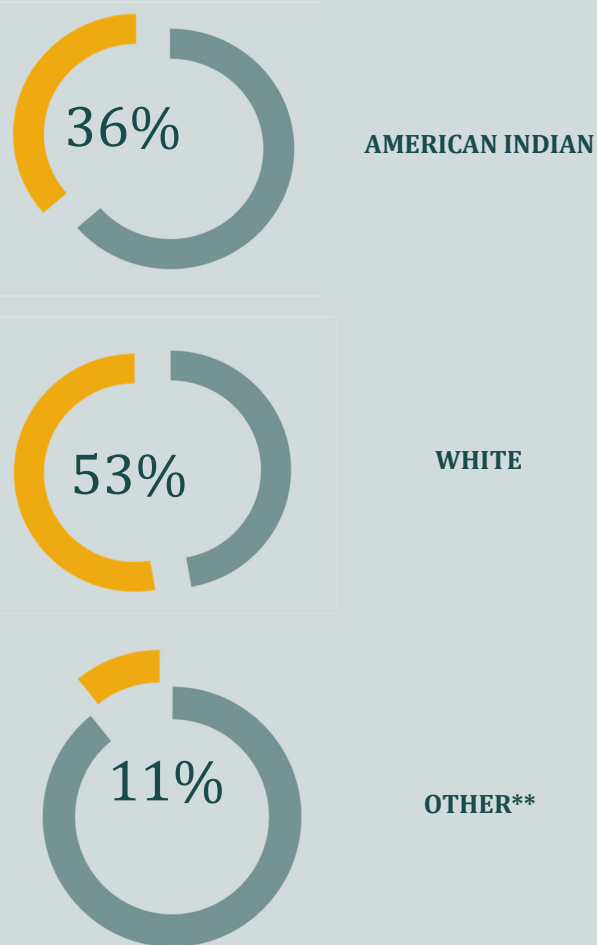


FIGURE 15. GONORRHEA CASES BY RACE*— MONTANA, 2020



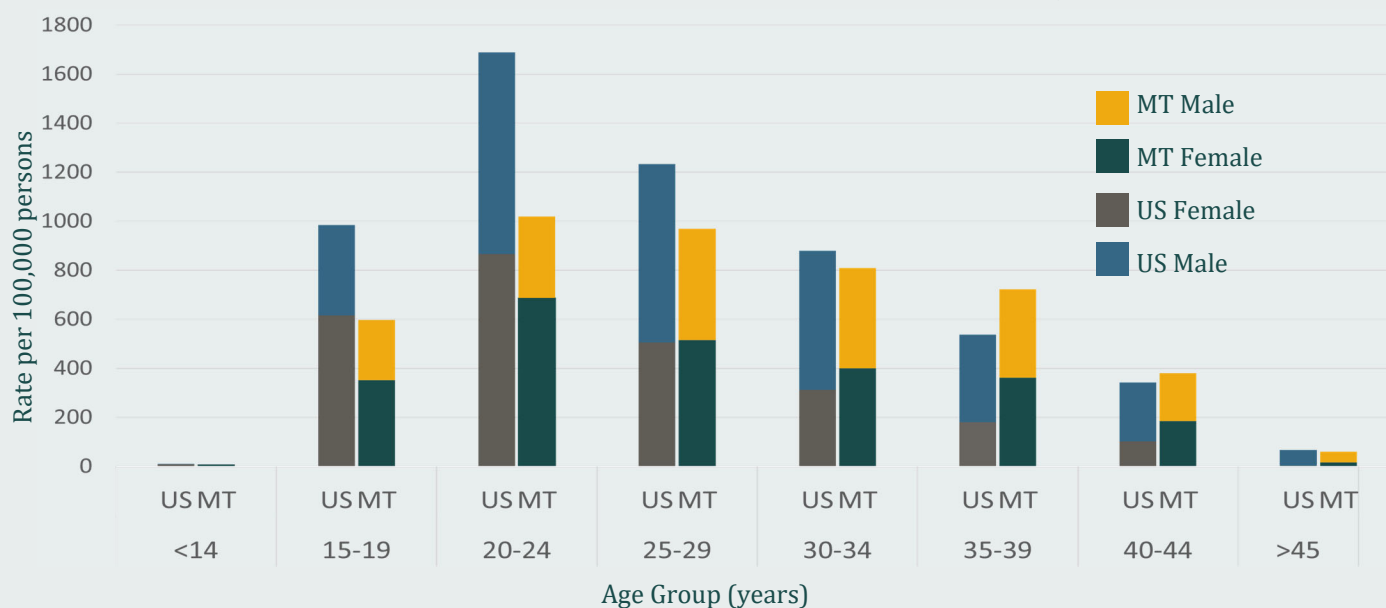
* Race classification is irrespective of ethnicity (Hispanic or non-Hispanic)

** Other includes persons of more than one race, black, and Asian/Pacific Islander, or unknown

Figure 16 displays the distribution of gonorrhea incidence by sex and age group in Montana as well as in the United States in 2020. In Montana, 887 gonorrhea cases (52%) were reported among females. Over the last six years, females have remained the majority of reported gonorrhea cases in Montana, unlike the rest of the US, where males are the majority of cases reported.

Of the 361 cases of gonorrhea diagnosed in the 20–24 year age group in Montana, 234 (65%) occurred among females. A large portion of the gonorrhea cases occur in the 20–24 and 25–29 year age groups regardless of gender; these two age groups accounted for 42% of the cases reported in Montana during 2020.

FIGURE 16. GONORRHEA INCIDENCE BY SEX AND AGE—MONTANA VS US, 2020



SYPHILIS

Syphilis is a genital ulcerative STI caused by the bacterium *Treponema pallidum*. It has often been called "the great imitator" because so many of the signs and symptoms of illness are indistinguishable from those of other diseases. Syphilis is passed from person to person through direct contact with a syphilis lesion. Infected pregnant women can also transmit the disease to the fetus. Without treatment, syphilis infection during pregnancy can lead to stillbirth, neonatal death, or infant disorders such as deafness, neurologic impairment, and bone deformities. About 25 to

40 percent of adults who remain untreated for syphilis can develop late disease affecting the heart, bones, internal organs, skin, and the central nervous system.

Syphilis can be divided into stages for the purposes of treatment and follow-up. Patients with early stages of syphilis (primary and secondary) represent recent infection and pose an increased risk of transmission to others. Beginning in 2015, the number of primary and secondary syphilis cases reported in Montana started increasing. From 2016 to 2019, the number of cases dramatically increased from 14 to 59. This was the highest case count of syphilis that Montana has seen in over a decade. However, in 2020, reported cases decreased to 44. It is possible the COVID-19 pandemic may have led to this decrease in reported cases due to fewer people accessing health care services.

Montana's primary and secondary syphilis case rate increased to 4.1 cases per 100,000 population in 2020 from 0.8 in 2014 (Figure 17). Syphilis incidence in Montana was lower than the U.S. rate of 12.7 cases per 100,000 population in 2020. Demographic characteristics are noted in Table 4, showing that most syphilis cases in Montana in 2020 were males (82%).



FIGURE 17. PRIMARY AND SECONDARY SYPHILIS CASE RATE — MONTANA, 2011-2020



TABLE 4. NEWLY DIAGNOSED SYPHILIS* CASES BY SELECT CHARACTERISTICS (N=44) — MONTANA, 2020

Characteristics	Number
Sex	
Male	36
Female	8
Age at diagnosis (years)	
≤19	0
20-24	3
25-29	11
30-34	11
35-39	7
40-45	2
45+	10
Ethnicity and race	
American Indian, non-Hispanic	10
White, non-Hispanic	20
Other, non-Hispanic	9
Hispanic, all races	5

*primary and secondary cases

HIV/AIDS

HIV (human immunodeficiency virus) is spread through many body fluids and targets parts of the immune system. While there is no cure, persons infected with HIV can be treated with antiretroviral therapy (ART), which can reduce viral load and prevent transmission to others during sexual contact. Left untreated, opportunistic infections or cancers take advantage of the weakened immune system, indicating that the person has entered the late clinical stage known as Acquired Immune Deficiency Syndrome (AIDS).

In 2020, 16 newly diagnosed HIV cases were reported in Montana. Since 2001, 14 to 32 new cases have been reported each year. Figure 18 shows that the rate of new cases has remained stable during this time. Most of the new cases are reported from the most populous counties: Yellowstone, Missoula, Cascade, Gallatin, and Flathead.

The leading transmission categories are male-to-male sexual contact (MSM) and injecting drug use (IDU) (Table 5). When comparing 2019 with 2020, there has been little difference in risk factor percentages aside from a decrease in the risk factor of IDU when not in conjunction with MSM. Unlike other STDs, American Indians are not disproportionately impacted by HIV.

FIGURE 18. REPORTED NEWLY DIAGNOSED HIV CASES PER 100,000—MONTANA, 2009–2020



TABLE 5. PERSONS NEWLY DIAGNOSED WITH HIV BY SELECT CHARACTERISTICS (N=16)— MONTANA, 2020

Characteristics	Number
Sex	
Male	14
Female	2
Age at diagnosis (years)	
<13	0
13-14	0
15-24	3
25-34	6
35-44	1
45-54	6
55-64	0
≥65	0
Ethnicity and race	
American Indian, non-Hispanic	0
White, non-Hispanic	15
Other, non-Hispanic	0
Hispanic, all races	1
Transmission category by sex†	
Male Only	
Male sexual contact w/ another male (MSM)	9
Injection drug use (IDU)	0
MSM & IDU	2
High-risk heterosexual contact‡	1
No identified risk	2
Female Only	
Injection drug use (IDU)	0
High-risk heterosexual contact‡	1
No identified risk	1

†Transmission category describes the combinations of risk factors by which a person may have acquired HIV

‡Heterosexual contact with a person known to have, or to be at high risk for, HIV infection



Tuberculosis

*Tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis*. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain. Not everyone infected with TB bacteria becomes sick. The disease is transmitted person to person, and those who become infected with TB can develop active disease at any time during their lifetime. Without treatment of the infection, about 10% of persons with normal immune systems will develop TB disease. The risk is much higher for persons with immunosuppressive conditions such as HIV, diabetes, chronic renal failure, drug or alcohol abuse, and children five years of age or younger.*

The number of TB cases reported annually in Montana and in the United States has steadily decreased over the past two decades. Figure 19 presents the number of TB cases over time by foreign-born persons and by race for U.S.-born persons. TB persists in specific high-risk populations, including foreign-born persons, communities of color, and persons experiencing homelessness. These populations are considered higher risk due to the high prevalence of endemic TB outside of the US, and the circulation of TB in certain communities of color and those experiencing homelessness. Overall, TB rates have steadily declined from 20 cases in 2001 to 4 in 2020 (Figure 19).

During the 1990s, an average of 20 cases was reported annually. Twenty years later, from 2011-2020, an average of 5 cases per year was reported (range: 2-9 cases per year). TB cases among American Indians have declined

from an average of 10 cases per year in the 1990s, to an average of 2 cases per year during the last 10 years (2011-2020), and in the last 5 years an average of 0.8 cases per year among American Indians were reported in Montana. There were no TB cases reported among American Indians in 2016 or 2017.

Four cases of active TB were reported in Montana in 2020. Counties of residence included Silver Bow, Yellowstone, Rosebud, and Missoula. The 2020 Montana TB incidence rate was 0.4 cases per 100,000 population, which is 5.5 times lower than the 2020 U.S. rate (2.2 per 100,000 population) (Figure 20).

One patient reported in 2020 was foreign born. One case had pulmonary/pleural disease, one had lymphatic TB, one had ovarian TB, and the fourth had *M. bovis* of the

FIGURE 19. REPORTED ACTIVE TUBERCULOSIS CASES BY RACE—MONTANA, 2001–2020

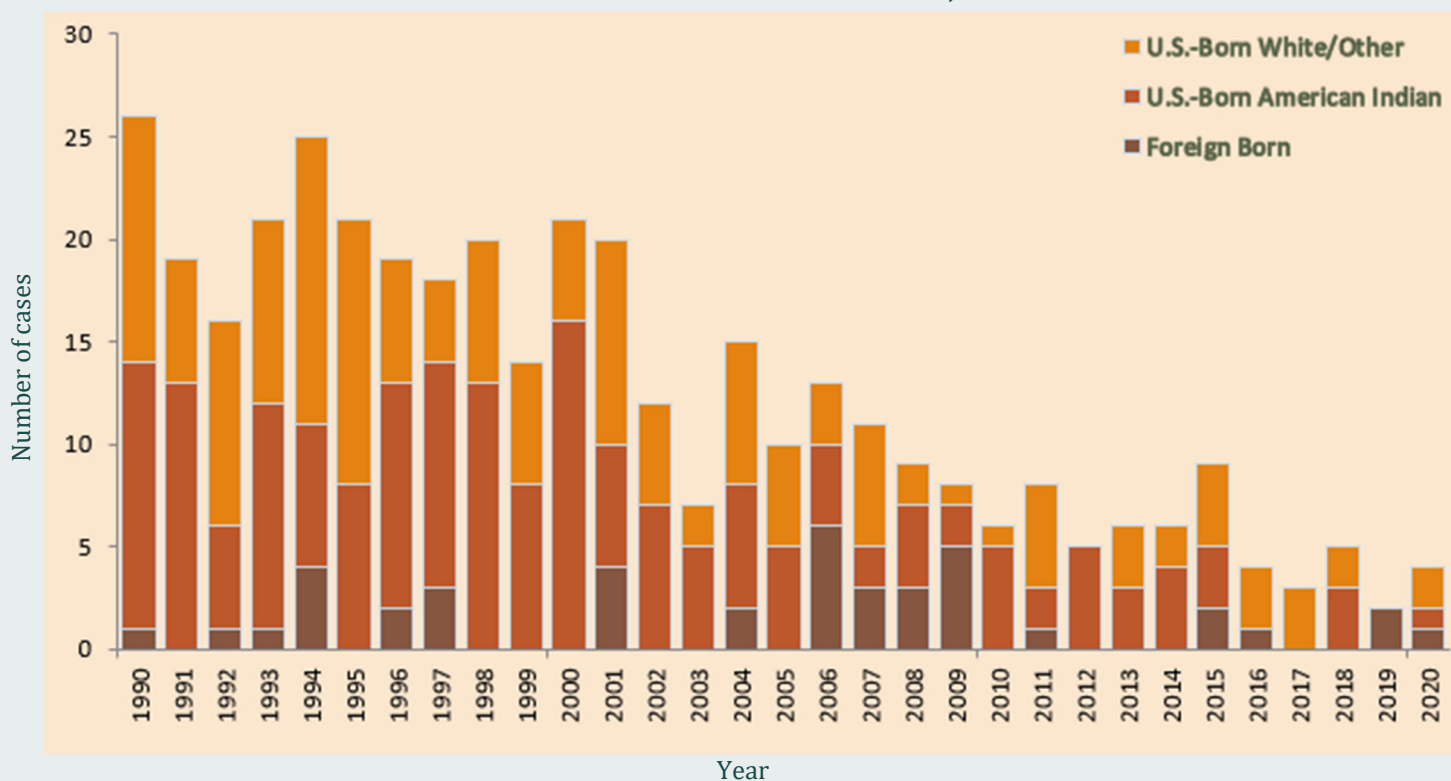
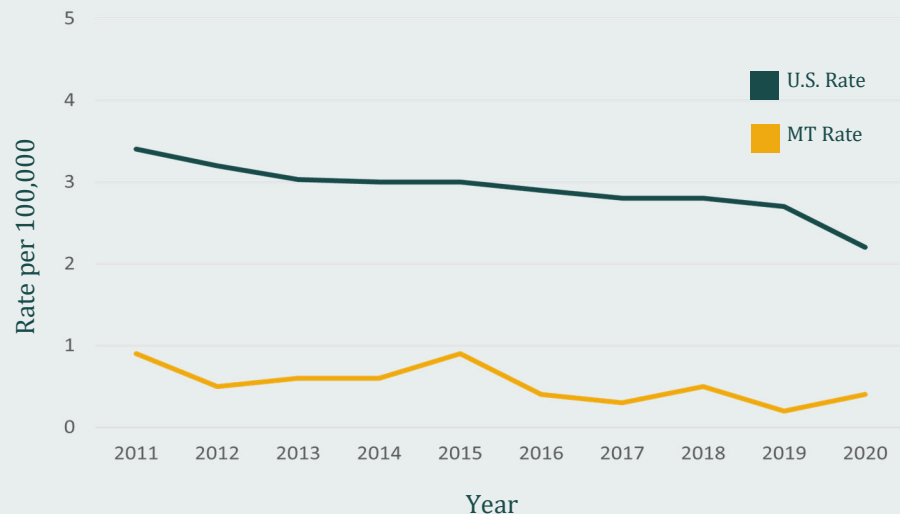


FIGURE 20. TUBERCULOSIS INCIDENCE RATE — MONTANA AND UNITED STATES, 2011–2020



peritoneum. Risk factors of note for these cases included: birth or travel in TB endemic countries and immunosuppression (not HIV/AIDS).

No contacts were found to be infected by the four cases. All cases were found incidentally and very early in disease. None of them had typical signs and symptoms of active TB disease.

One of the cases in 2020 had an isoniazid drug-resistant TB organism. Drug resistant TB is rare. During 2020, isoniazid resistance was reported for 456 cases out of 7,174 cases in total in the United States (6.4%) while multi-drug resistant TB was reported for 56 cases in the United States (0.78%).

Despite the low numbers of TB cases reported in Montana and nationally, a number of challenges remain that slow the progress toward TB elimination. Improved diagnostic tools, new drugs that enable shorter, effective treatment of both latent TB infection and active disease, and an effective vaccine are critical for achieving national and global TB elimination.



Viral Hepatitis

Hepatitis refers to an inflammation of the liver. Heavy alcohol use, toxins, some medications, and certain medical conditions can cause hepatitis. One of the main causes of hepatitis are viruses; the most common types of viruses that cause hepatitis are hepatitis A, B, and C. Symptoms of hepatitis include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, grey-colored stools, joint pain, and jaundice. Symptoms of hepatitis appear any time from 2 weeks to 6 months after exposure. Symptoms of chronic viral hepatitis can take decades to develop, and many people with hepatitis are asymptomatic.

HEPATITIS A

Hepatitis A virus (HAV) infection is primarily transmitted by the fecal-oral route through consumption of contaminated food or water or by person-to-person contact. Although viremia occurs early in infection and can persist for several weeks after onset of symptoms, bloodborne transmission of HAV is uncommon. Newly acquired cases are identified by signs and symptoms with supportive laboratory evidence. There is no chronic phase of HAV. There is an effective vaccine against HAV.

In 2020, 8 cases of HAV were reported in Montana.

HEPATITIS B

Hepatitis B is a liver infection caused by the hepatitis B virus (HBV). Hepatitis B is transmitted when blood, semen, or another body fluid from a person infected with

the virus enters the body of someone who is not infected. This can happen through sexual contact, injection drug use (IDU), or from mother to baby at birth. For some, HBV is an acute, or short-term, illness but for others, it can become a long-term, chronic infection. Chronic hepatitis B can lead to serious health issues, including cirrhosis or liver cancer. HBV infections have decreased significantly over time with increased use of an effective vaccine. In 2020, 21 chronic HBV infections were reported in Montana. It's possible that some of these cases may have had the disease for years but were only recently identified. The median age of cases was 49 years and 71% of cases were male. There were five acute HBV cases, indicating recent infection, reported in Montana.

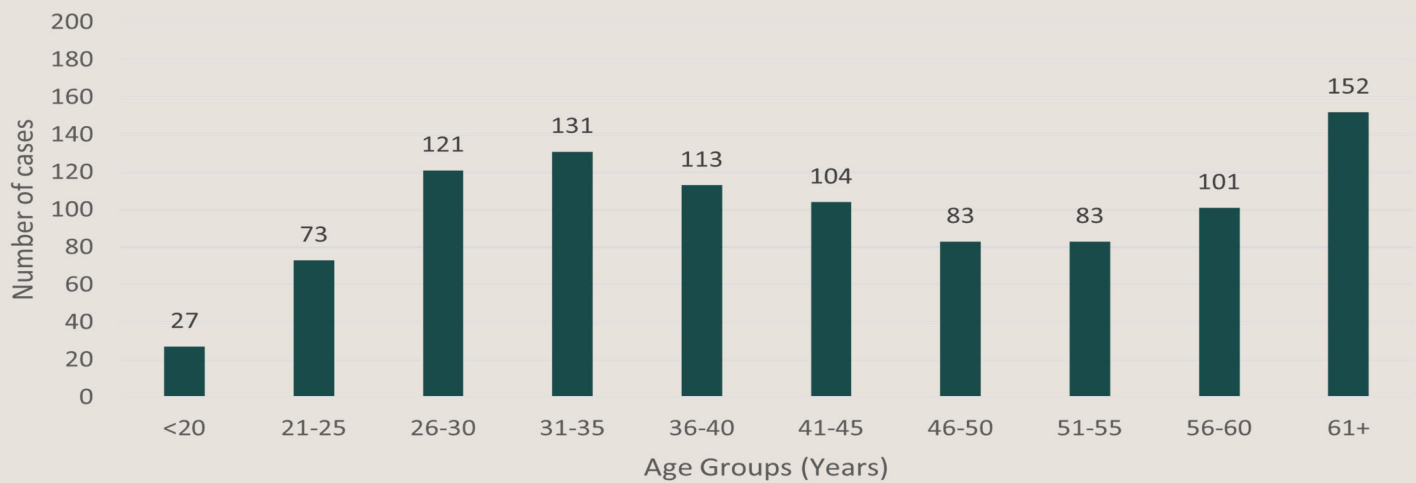
HEPATITIS C

Hepatitis C is a liver disease that ranges in severity from a mild illness lasting a few weeks to a serious, lifelong illness. It results from infection with the hepatitis C virus (HCV), and is spread primarily through contact with blood of an infected person. Like HBV, HCV can be either acute or chronic. Chronic HCV infection can last a lifetime and lead to serious liver problems, including cirrhosis or liver cancer. In 2020, 982 cases of chronic HCV were reported to DPHHS (Table 6). Not all cases were newly acquired; some may have been infected years ago. While there is no vaccine for HCV, treatment can cure more than 90% of cases. However, CDC estimates that 40% of people with hepatitis C in the US are unaware of their infection⁶. The incidence rate of chronic HCV infections in Montana between 2011 and 2020 is shown in Figure 21.



FIGURE 21. INCIDENCE RATE OF CHRONIC HEPATITIS C INFECTIONS—MONTANA, 2011-2020



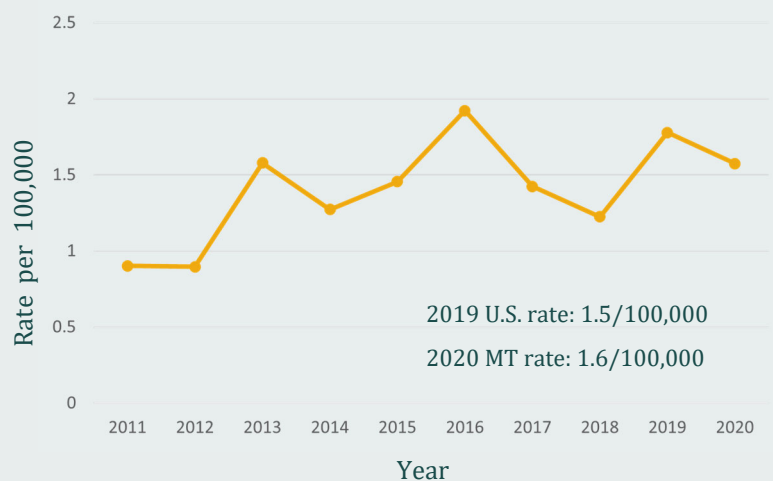
FIGURE 22. NEWLY REPORTED CHRONIC HEPATITIS C INFECTIONS BY AGE GROUP—MONTANA, 2020**TABLE 6. DEMOGRAPHIC CHARACTERISTICS OF PERSONS WITH CHRONIC HEPATITIS C — MONTANA, 2020**

GENDER			RACE		
Male	593	60%	White	616	63%
Female	386	39%	American Indian	282	29%
Unknown	3	<1%	Other/Unknown	84	8%

The Centers for Diseases Control and Prevention recommends that all women in pregnancy be screened for HCV and all adults ≥ 18 years be tested at least once. It should be noted that a decrease in screening efforts due to COVID-19 may have lead to a decreased number of HCV cases being diagnosed in 2020.

Acute hepatitis C is a short-term viral infection caused by the hepatitis C virus. After being infected with acute HCV, about 75% to 80% of people will go on to develop chronic HCV. Because of its short time span and the fact that in many cases, the disease causes no symptoms, cases of acute HCV are often not detected.

An average of 16 cases of acute HCV cases are reported to DPHHS each year. Seventeen cases (1.6 per 100,000) were reported in 2020. The most common risk factor identified was IDU.

FIGURE 23. ACUTE HEPATITIS C INFECTIONS — MONTANA, 2011-2020**TABLE 7. DEMOGRAPHIC CHARACTERISTICS OF PERSONS WITH ACUTE HCV, MONTANA 2020(N=17)**

GENDER			RACE		
Male	10	59%	White	15	88%
Female	7	41%	American Indian	2	12%

Zoonotic & Vectorborne Diseases

RABIES

Rabies is a vaccine-preventable viral disease that is almost universally fatal and is most often transmitted to humans through the bite of a rabid animal. Most animal rabies cases reported to DPHHS each year occur among wild animals, including skunks and bats. Occasionally domestic animals (e.g., cats, dogs, and horses) are also infected. Human exposure can occur through contact with the saliva or neural tissue of an infected wild or domestic animal. A bite from an infected animal is the most common route of human exposure.

In 2020, 1551 animals were tested for rabies at the Montana Veterinary Diagnostic Laboratory, resulting in twelve bats and one skunk positive for the rabies virus (Figure 24). The last cases of human rabies in Montana were reported in 1996 and 1997; both were associated with bat exposures.

Rabies in humans is preventable through prompt and appropriate medical care and use of rabies post-exposure prophylaxis (rPEP). In 2020, 179 people, including Montana residents and out-of-state residents potentially exposed in Montana, received the recommendation to pursue rPEP to prevent disease after exposure to an animal that is capable of transmitting rabies.



FIGURE 25. TYPES OF EXPOSURES THAT LED TO rPEP RECOMMENDATIONS—MONTANA, 2020

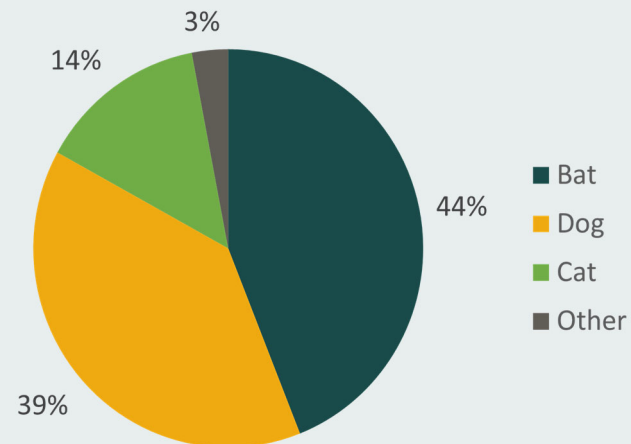
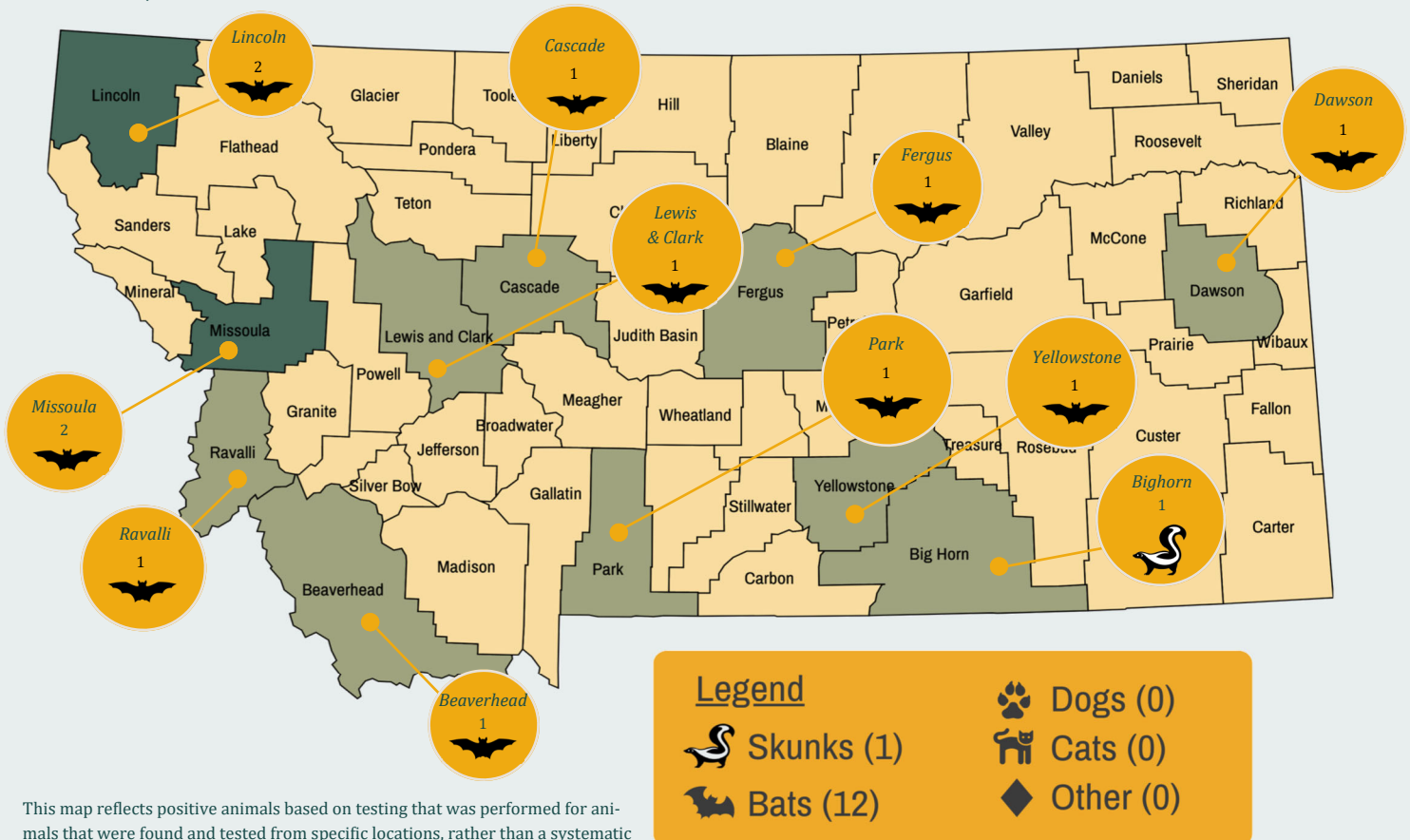


FIGURE 24. ANIMALS THAT TESTED POSITIVE FOR RABIES VIRUS — MONTANA, 2020



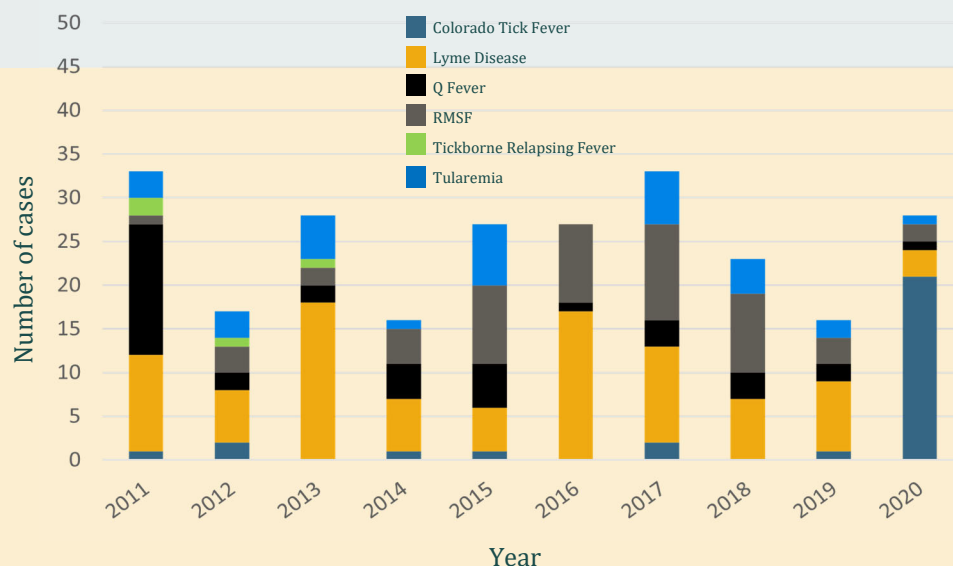
This map reflects positive animals based on testing that was performed for animals that were found and tested from specific locations, rather than a systematic survey of animals from across the state. It is assumed that the potential for rabid bats and skunks exists all over Montana.



TICKBORNE DISEASES

Pathogens present in Montana that can be transmitted to humans by ticks include those that cause Colorado tick fever virus, Rocky Mountain Spotted Fever (RMSF, *Rickettsia spp.*), tickborne relapsing fever (*Borrelia hermsii*), Q fever (*Coxiella burnetii*), and tularemia (*Francisella tularensis*). The number of reported cases from each of the last ten years is shown in Figure 26. In general, the most commonly reported tickborne disease in Montana is travel-associated Lyme disease. However, in 2020 the highest number of cases for tickborne disease was Colorado tick fever, with 21 reported cases, followed by only three cases of Lyme disease (Figure 26).

FIGURE 26. REPORTED CASES OF TICKBORNE DISEASES — MONTANA, 2011–2020



In addition to vectorborne transmission, tularemia and Q Fever can be acquired through inhalation of contaminated aerosols. Q Fever can also be transmitted through exposure to milk, urine, feces, or birth products from infected farm animals (particularly sheep, cattle, and goats).

In 2020, there was one case of tularemia and one case of Q fever (acute) reported in Montana residents.

Precautions should be taken to minimize exposure to ticks, fleas, and deer flies, as well as to provide protection in settings where aerosolization of the bacteria could occur.

OTHER VECTORBORNE DISEASES

Two cases of malaria were reported in Montana in 2020, from two separate counties. They were both associated with international travel.

Before traveling, Montanans should plan to limit exposure to mosquitoes and ticks and get appropriate vaccines or prophylaxis to prevent vectorborne diseases.

WEST NILE VIRUS

West Nile virus (WNV) is an arbovirus that is transmitted by infected mosquitoes throughout the United States. Most persons infected with WNV do not exhibit symptoms. Less than one percent of infected persons develop West Nile neuroinvasive disease (WNND), a serious and potentially life threatening condition.

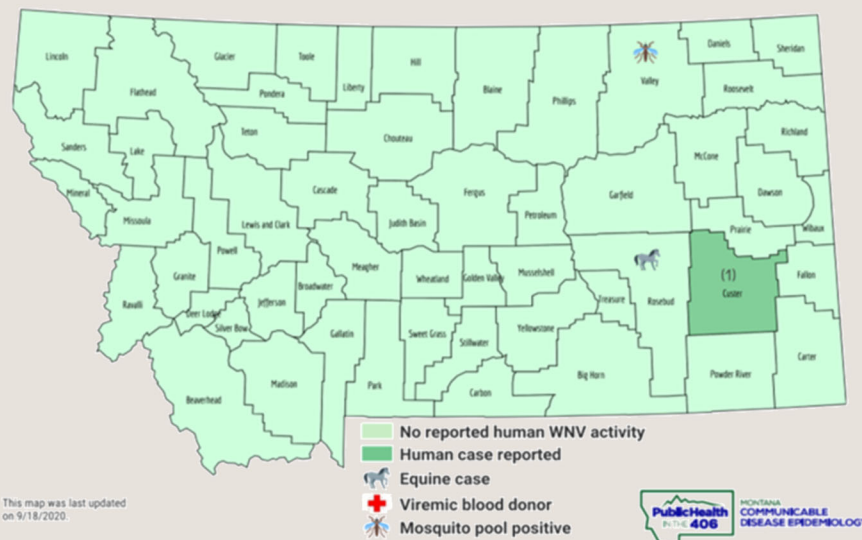
In 2020, only one county in Montana reported a human case of WNV (Custer). There were no reported viremic blood donors. The case ended up with WNND, and was hospitalized. No deaths were reported in 2020. The single case reported was an individual over 50 years of age. Since the introduction of WNV into Montana in 2002, the number of cases in Montana has varied from year to year. Twelve of the nineteen years of WNV surveillance had fewer than 20 annual cases (range 0–11). Four years had between 26 and 51 cases (2005, 2006, 2013, 2018) and two years (2003 and 2007) had over 200 cases. WNV season usually runs from July until October, with most cases reported in August and September.

In addition, mosquito pools are tested and reported to Montana DPHHS each year. In 2020, there were 49 counties that submitted mosquitoes for WNV

testing. Only one county reported a positive mosquito pool. The pool was located in Valley county.

Given the variation of WNV activity in Montana and nationally, and uncertainty of forecasting the disease burden, prevention steps must be emphasized. Montanans are reminded to prevent mosquito bites every season through use of mosquito repellent, limited outdoor activity during dawn and dusk, covering skin with clothing, and elimination of breeding pools in vessels around the home.

FIGURE 27. WEST NILE VIRUS ACTIVITY BY COUNTY - MONTANA, 2020





HANTAVIRUS

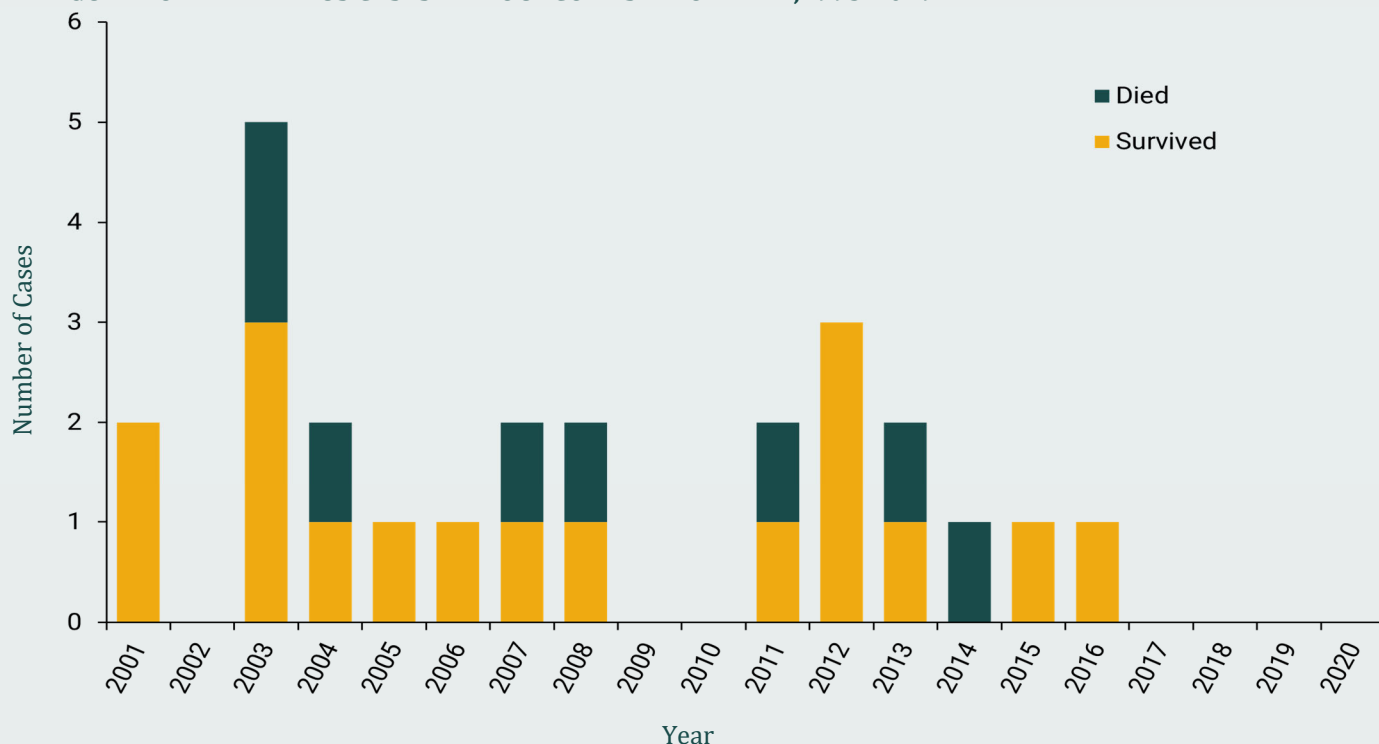
Hantavirus is a serious disease first recognized in 1993. It is most often caused by the Sin Nombre virus in Montana. It is transmitted to humans through exposure to infected rodent urine, droppings, or saliva. The deer mouse is the most common host of the virus and is widespread in Montana.

Most Montana hantavirus cases have been reported during spring and summer months (77%). Of Montana's 56 counties, 43% have reported at least one case of hantavirus. Since 1993, Montana has reported 44 cases of hantavirus infection, including 10 deaths (Figure 28).

No cases of hantavirus were reported in Montana from 2017 to 2020.

Reducing potential exposures to rodents is key to preventing hantavirus. This includes sealing up holes and gaps in homes and garages, and carefully cleaning areas of mouse infestation.

FIGURE 28. HANTAVIRUS CASES AND OUTCOMES—MONTANA, 1993-2019



Other Diseases



COCCIDIOIDOMYCOSIS (VALLEY FEVER)

Coccidioidomycosis, also called Valley fever, is an infection caused by the fungus *Coccidioides immitis*. The fungus is found in the soil in the southwestern United States, Mexico, and South America. In the United States, *Coccidioides* fungus can be found in Arizona, California, Nevada, New Mexico, Texas, and Utah. People can become infected by breathing in dust that contains the fungal spores. Coccidioidomycosis is most common in adults aged 60 and older.

Coccidioidomycosis is not endemic in Montana. Most of Montana's cases are in individuals that previously lived or worked in areas where coccidioidomycosis is endemic. The remainder of cases that are seen in Montana are residents that spend their winters in endemic areas.

In 2020, there were 15 cases of coccidioidomycosis reported,

11 of whom were aged 60 years and older. Most cases reported spending time in states endemic for *C. immitis*.

CREUTZFELDT-JAKOB DISEASE

Creutzfeldt-Jakob Disease (CJD) is a rare transmissible spongiform encephalopathy (TSE) that is universally fatal and causes death in one to two individuals per million nationwide. CJD is classified into three categories: iatrogenic (acquired through infected tissue), familial (individuals who have inherited mutations of the prion protein gene), and sporadic (random mutations of the prion protein gene). Nationwide, approximately 85% of cases are designated as sporadic. In Montana, cases range between zero to four per year. In 2020, three cases of CJD were reported, two females and one male all older than 60 years of age.





LEGIONELLOSIS

Legionellosis is an infection caused by the bacterium *Legionella*. The disease presents as either a mild febrile illness (Pontiac Fever), or a form of pneumonia called Legionnaires' disease that can become severe. The case fatality rate of Legionnaires' disease is about 10%, and those who are over the age of 50, are smokers, and/or have chronic diseases are most at risk for infection. *Legionella* bacteria are found naturally in the environment, and become a problem when they infiltrate and grow in settings like building water systems, hot tubs, pools, and decorative fountains that are not well maintained. People become infected when they breathe in the aerosolized bacteria. Montana has an average of 8 cases reported a year, and case counts of Legionnaires' disease are increasing both in Montana and the United States. This is likely due to an increase in awareness and diagnostic testing, and possibly by changing environmental factors. There were 7 reported cases of Legionnaires' disease in Montana in 2020, and 86% were aged 50 years or older. Of the 7 cases, 6 were hospitalized. In institutional settings, water management programs are essential to preventing the spread of *Legionella*. In other settings, proper maintenance of pools, hot tubs, and water features is necessary to prevent transmission.

FIGURE 29. CHARACTERISTICS OF *LEGIONELLA* — MONTANA, 2020



AT RISK BY BREATHING IN SMALL DROPLETS

Legionnaires' disease is a severe form of pneumonia, most often caused by the bacterium *Legionella pneumophila*. People who are at risk can become ill by breathing in small droplets of water that contain *Legionella*.

CASES INCREASING OVER TIME

There were an average of 4 Legionnaires' disease cases reported annually between 2001 and 2010, and 9 average cases reported annually between 2011 and 2020.

RAIN, DROUGHT, WARMER TEMPERATURES

Potential factors affecting the rise in cases are an increase in diagnostic testing and changing environmental factors such as increased rain, drought, and warmer temperatures that disrupt water systems.

Acknowledgements

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- The Montana Department of Commerce and the CDEpi team for beautiful photos of Montana.

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Appendix I: Comparative Statistics for Reportable Communicable Diseases—Montana, 2011–2020*†

CONDITION	Reported cases											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2020 Rate†	5-year median
Campylobacteriosis	236	233	205	216	323	372	406	432	374	300	27.8	374
Chlamydia	3412	3827	3818	4193	4183	4423	4552	4901	4752	4138	382.9	4552
Coccidioidomycosis	5	3	3	10	12	13	18	28	25	15	1.4	18
Colorado Tick Fever	1	1	0	1	1	0	2	0	1	21	1.9	1
COVID-19	0	0	0	0	0	0	0	0	0	85195	7884	0
Cryptosporidiosis	77	69	125	66	39	62	70	81	72	48	4.4	70
Cyclosporiasis	0	0	0	2	3	0	3	10	2	1	0.1	2
Giardiasis	87	67	91	89	93	120	125	89	79	76	7.0	89
Gonorrhea	84	108	224	434	844	868	781	1176	1571	1696	157.0	1176
Haemophilus influenzae, invasive	3	6	6	14	15	19	19	17	27	13	1.2	19
Hemolytic Uremic Syndrome (HUS)	1	1	0	5	2	1	2	1	0	1	0.1	1
Hepatitis A	3	6	6	5	2	3	3	0	17	8	0.7	3
Hepatitis B, acute	0	2	4	0	7	1	3	1	1	5	0.5	1
Hepatitis B, chronic	24	27	21	32	35	21	35	20	25	21	1.9	21
Hepatitis C, acute	9	9	16	13	15	21	15	13	19	17	1.6	17
Hepatitis C, chronic	1349	1544	1142	1413	1386	1664	1665	1530	1335	982	90.9	1530
HIV/AIDS	21	22	23	14	18	22	30	23	26	16	1.5	23
Legionellosis	1	4	10	5	8	10	17	10	14	7	0.7	10
Listeriosis	1	0	1	1	2	2	0	0	0	2	0.2	0
Lyme disease	11	6	18	6	5	17	11	7	8	3	0.3	8
Malaria	2	0	0	2	1	5	3	3	0	2	0.2	3
Multisystem Inflammatory Syndrome (MIS) COVID-19	0	0	0	0	0	0	0	0	0	4	0.4	0
Mumps	0	1	0	1	1	26	6	6	17	1	0.1	6
Pertussis	134	547	663	494	230	21	106	143	494	40	3.7	106
Q fever	15	2	2	4	5	1	3	3	2	1	0.1	2
Rabies, animal	18	25	36	16	21	10	13	17	18	13	1.2	13
Rabies, post-exposure prophylaxis (PEP)	NR	NR	NR	112	198	153	199	223	206	178	16.5	199
Salmonellosis (excluding para-typhoid and typhoid)	120	110	94	145	195	177	140	135	136	190	17.6	140
Shiga toxin-producing Escherichia coli (STEC)	39	44	49	39	85	133	97	121	69	92	8.5	97
Shigellosis	124	12	69	44	14	8	10	12	11	15	1.4	11
Spotted Fever Rickettsiosis	1	3	2	4	9	9	11	9	3	2	0.2	9
Streptococcus pneumoniae, invasive	22	33	31	41	61	99	112	121	131	84	7.8	112
Syphilis (primary and secondary)	9	3	8	9	13	14	48	45	59	44	4.1	45
Transmissible spongiform encephalopathies (TSE), including CJD	4	1	3	3	1	1	2	2	2	3	0.3	2
Tuberculosis	8	5	6	6	9	4	3	5	2	4	0.4	4
Tularemia	3	3	5	1	7	3	6	4	2	1	0.1	3
Varicella	163	133	84	72	132	77	54	57	52	33	3.1	54
Vibriosis	NR	NR	3	2	0	2	8	14	2	3	0.3	3
West Nile Virus	1	6	38	5	3	7	11	47	3	1	0.1	7

*Confirmed cases only. †Conditions for which there were zero (0) cases in 2020 are not reflected in this table. ‡Rate = per 100,000. NR = Not Reportable. N/A = Not Applicable.

Appendix II: Montana Demographic Profile, 2020

Montana is a geographically large state with a small population. It is the fourth largest state by area in the United States with just over one million residents. There are 58 public health jurisdictions within the state that include 50 individual counties, one health district composed of six rural counties, as well as seven tribal health departments. Over one quarter of the population resides in areas where the population density is categorized as “frontier.” Above 60% of all case reports of reportable diseases for Montana were submitted from six counties, all with populations $\geq 60,000$ residents.^{*,‡}

CHARACTERISTIC	POPULATION	PERCENT [‡]
	1,080,577	100
GEOGRAPHIC CLASSIFICATION		
Urban	162,990	15%
Rural	628,594	58%
Frontier	288,993	27%
SEX		
Male	543,923	50%
Female	536,476	50%
AGE GROUP (YEARS)		
<1	11,365	1%
1-4	48,549	4%
5-14	130,691	12%
15-24	136,889	13%
25-44	274,301	25%
45-64	265,212	25%
65+	213,392	20%
RACE		
White	978,119	91%
American Indian/Alaska Native	78,116	7%
Black or African American	11,046	1%
Asian	13,296	1%
ETHNICITY		
Not Hispanic or Latino	1,035,617	96%
Hispanic or Latino	44,960	4%

^{*}From the Montana Infectious Disease Information System (MIDIS) generated report of 2020 data. The six counties are Yellowstone, Missoula, Gallatin, Flathead, Cascade, and Lewis and Clark.

[‡]Based on 2020 population estimates from the National Center for Health Statistics Vintage 2020 postcensal estimates of the resident population of the United States (April 1, 2010, July 1, 2020) by year, county, single-year of age, bridged race, Hispanic origin, and sex. Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: [/nchs/nvss/bridged_race.htm](https://www.census.gov/nchs/nvss/bridged_race.htm) as of September 22, 2021, following release by the U.S. Census Bureau of the unbridged Vintage 2020 postcensal estimates by 5-year age group on June 27, 2021.

Appendix III: Diseases and Conditions Reportable to Public Health in Montana, 2020

Montana health care providers are required to report cases of the following conditions to their local health department*. This reporting falls within HIPAA medical privacy exceptions for release of information. Reporting patients with the conditions below does not require patient consent. Reporting enables public health officials to conduct follow up on cases of significance, and to identify outbreaks or emerging health concerns.

Acquired Immune Deficiency Syndrome (AIDS)	Listeriosis
Anaplasmosis	Lyme disease
Anthrax	Lymphogranuloma venereum
Arboviral disease (including California serogroup, Eastern equine encephalitis, Powassan, St. Louis encephalitis, West Nile Virus, Western equine encephalitis)	Malaria
Arsenic poisoning (≥ 70 micrograms per liter total arsenic in urine; or ≥ 35 $\mu\text{g/L}$ methylated plus inorganic arsenic in urine)	Measles (<i>rubeola</i>)
Babesiosis	Meningococcal disease (<i>Neisseria meningitidis</i>)
Botulism (including infant botulism)	Mercury poisoning (≥ 200 $\mu\text{g/L}$ total mercury in urine; or 20 μg elemental mercury/g creatinine in urine; or ≥ 10 $\mu\text{g/L}$ elemental, organic, and inorganic blood mercury levels)
Brucellosis	Mumps
Cadmium poisoning (≥ 5 $\mu\text{g/L}$ total blood cadmium levels; or ≥ 3 $\mu\text{g/L}$ in urine)	Pertussis (whooping cough)
Candida auris	Plague (<i>Yersinia pestis</i>)
Campylobacteriosis	Poliomyelitis
Chancroid	Psittacosis
<i>Chlamydia trachomatis</i> infection	Q fever (<i>Coxiella burnetii</i>)
Coccidioidomycosis	Rabies, human and animal (including exposure to a human by a species susceptible to rabies infection)
Colorado Tick Fever	Rickettsiosis
Cryptosporidiosis	Rubella (including congenital)
Cyclosporiasis	Salmonellosis
Dengue virus	Severe Acute Respiratory Syndrome-associated coronavirus (SARS)
Diphtheria	Shigellosis
Ehrlichiosis	Smallpox
<i>Escherichia coli</i> , Shiga toxin-producing (STEC)	<i>Streptococcus pneumoniae</i> , invasive disease
Gastroenteritis outbreak	Syphilis
Giardiasis	Tetanus
Gonococcal infection	Tickborne relapsing fever
<i>Granuloma inguinale</i>	Toxic shock syndrome, non-streptococcal
<i>Haemophilus influenzae</i> , invasive disease	Transmissible Spongiform Encephalopathies
Hansen's disease (leprosy)	Trichinellosis (Trichinosis)
Hantavirus Pulmonary Syndrome/infection	Tuberculosis
Hemolytic Uremic Syndrome, post-diarrheal	Tularemia
Hepatitis A	Typhoid Fever
Hepatitis B, acute, chronic, perinatal	Varicella
Hepatitis C, acute, chronic	<i>Vibrio cholerae</i> infection (Cholera)
Human Immunodeficiency Virus (HIV)	Vibriosis
Influenza (including hospitalizations/deaths)	Viral Hemorrhagic fevers
Lead poisoning (blood levels \geq than 5 micrograms deciliter for children ≤ 13 years of age)	Yellow Fever
Legionellosis	Any unusual incident of unexplained illness or death in a human or animal with potential human health implications
Leptospirosis	

An up-to-date list of Reportable Diseases in Montana is maintained on our website. To view the current list, please visit: <http://www.mtrules.org/gateway/RuleNo.asp?RN=37%2E114%2E203>

*Specific requirements related to reporting, investigation, and control of specific conditions are found in the Administrative Rules of Montana



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