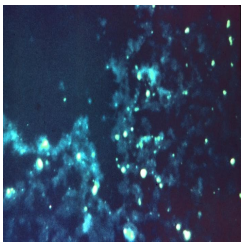
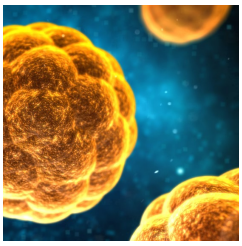


2018

Communicable Disease Report

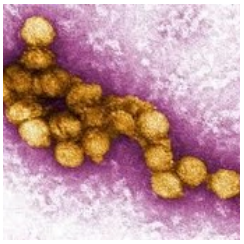


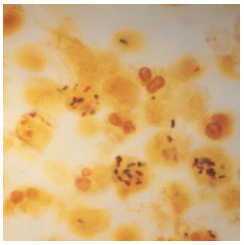




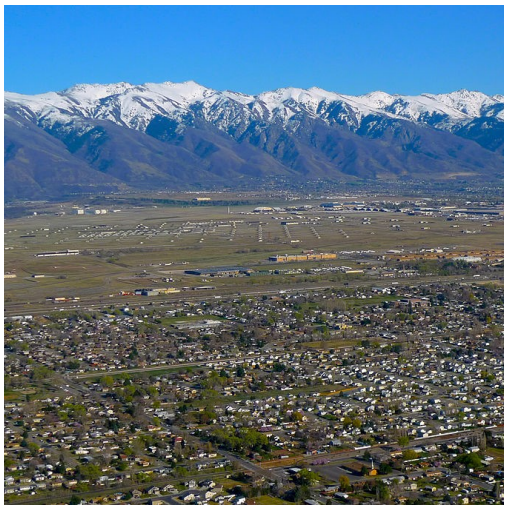
Davis County Health Department

Communicable Disease & Epidemiology Bureau

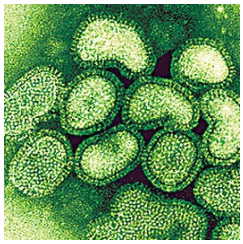




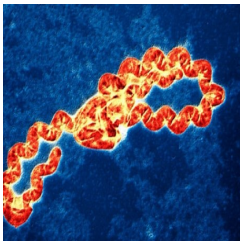












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Executive Summary

This annual communicable disease surveillance report summarizes all communicable diseases reported in Davis County in 2018. It provides a baseline picture of the disease burden in Davis County, describing trends and highlighting those diseases that had the greatest impact on the health and well-being of our community. Unusual disease occurrences are also discussed.

Several notable disease events occurred in Davis County during 2018. These have been summarized below:

- A large, multi-state outbreak of hepatitis A made its way to Utah during 2017 and continued throughout 2018. As of January 2019, 281 cases have been identified in Utah. The cases within this outbreak are often part of high-risk groups including those who are experiencing homelessness, using illicit drugs, or were recently incarcerated. The majority of cases have been identified in Salt Lake County (69.4%) and Utah County (16.0%) with several other cases reported statewide. Six cases in Davis County have been associated with this outbreak, five of which were identified in 2018. As of January 2019, it has been several weeks since Utah has had a hepatitis A case related to the outbreak. As a result, this outbreak will likely be declared over soon.

  Throughout 2018, Davis County Health Department (DCHD) was actively involved in prevention and treatment efforts associated with this outbreak. In the early months of 2018, several restaurants (including a Utah County Olive Garden and a Salt Lake County 7- Eleven) announced that staff members had worked while ill with hepatitis A. As a result, it was recommended that patrons of these facilities receive a hepatitis A shot prophylactically – if they had not been previously vaccinated for hepatitis A. Davis County Health Department followed-up with 29 individuals who had visited one of the facilities while an ill staff member had been working. Of those, DCHD administered immunizations to seven people who had not previously been vaccinated for hepatitis A.

  Additionally, Davis County Health Department reached out to drug-treatment facilities in the county and offered free vaccinations to any of their patrons who had not been previously vaccinated. DCHD conducted four outreach clinics during 2018 and administered 26 doses of hepatitis A vaccine.

- In August of 2018, a suspected case of mumps was reported in a teacher in Davis School District's (DSD) Spanish immersion program. The teacher lived in Salt Lake County, but potentially exposed several people in Davis County, including students and fellow teachers. Davis County Health Department visited the school and held an information meeting with the school's teachers and administration. Seven immunizations were administered to teachers who had not been previously vaccinated or could not find documentation of previously having an MMR shot. Davis County Health Department worked with Davis School District to review the immunization records of all students in the suspected teacher's class. Fortunately, no students had a vaccine exemption for MMR, thus no students needed to be excluded from school. A letter of information was also distributed to parents of the elementary school instructing parents to watch for signs and symptoms of mumps, while also ensuring their student's vaccination records were up-to-date. DCHD also worked with the 21 other Spanish immersion teachers and gathered immunization records to verify that they had received at least one dose of the MMR vaccine.

  Subsequent laboratory testing on the suspected case returned with negative results. As a result, the individual was determined to **not** be infected with mumps. However, this instance portrays the time and efforts that often go into investigating a case – regardless of the outcome. This experience also reiterates the importance of promoting vaccination, not only among students, but also among the teachers and staff in the school setting.

- In the fall of 2018, a Utah resident was confirmed with and passed away from rabies. This was the first human death from rabies in Utah since 1944. The individual was from central Utah and had exposure to bats that had roosted in their home. Rabies is an infectious virus that is most often transmitted through saliva of an infected host, usually through a bite or through other mucous membranes. However, it can be prevented by seeking rabies post-exposure prophylaxis (PEP) which includes administration of human rabies immunoglobulin (HRIG) and four subsequent doses of rabies vaccine that are given on days 0, 3, 7, and 14. Several family members and healthcare workers had potential exposure to the case and were given recommendations to receive PEP. Davis County Health Department followed-up with family members and ensured PEP was completed.

- The rate of sexually transmitted diseases (STDs) continues to steadily climb in Davis County and Utah. In Davis County, between 2017 to 2018, the number of syphilis cases increased by over 56%, gonorrhea by 30%, and chlamydia by 6%.

  Davis County Health Department is well-aware of the constant upward trend in sexually transmitted diseases. In 2018, Davis County Health Department was awarded funding through the Personal Responsibility Education Program (PREP) grant to provide STD/HIV education at a community level. This grant will provide the opportunity for Davis County Health Department to teach an evidence-based curriculum regarding responsible sexual and other physical health behaviors to Clearfield Job Corps Center residents in 2019. DCHD is excited for this opportunity and is hopeful that the program could be expanded to the general community in the future.

- The 2017-18 influenza season (October 2017 through May 2018) was one of the most severe seasons in Davis County, surpassing the recent 2014-15 and 2009-10 seasons which were both unusually high. This was likely due to the 2017-18 season's limited vaccine effectiveness. Overall, the vaccine was estimated to be 25% effective against influenza A (H_3N_2), 67% against influenza A (H_1N_1), and 42% against influenza B. A total of 202 hospitalized-influenza cases were reported in Davis County with the predominant circulating strain being influenza A (H_3). The current influenza season (October 2018 through May 2019) has been relatively quiet thus far with only **45** hospitalized-influenza cases, as of the end of January 2019. The predominant circulating strain this season has been identified as influenza A (H_1N_1).

- In August of 2018, the Centers for Disease Control and Prevention (CDC) identified a national outbreak of *Salmonella* Newport that is likely linked to ground beef consumption. As of December 12, 2018, 333 people have been reported with *Salmonella* Newport from 28 states, including 11 from Utah. Davis County residents accounted for **four** of these cases. Traceback investigations identified a common meat processing plant. The plant issued a recall on October 4, 2018 that affected more than 100 chain retail locations and local stores, including Sam's Club and Sprouts locations in Utah. The outbreak is ongoing, although cases have significantly diminished.

Introduction



Davis County Health Department Communicable Disease and Epidemiology (CD/Epi) Bureau works in partnership with the medical community and neighboring health jurisdictions to control and prevent the occurrence and spread of communicable diseases. This is accomplished through disease surveillance, disease investigation, coordination of prevention efforts, treatment, education, training, and policy development. The bureau aims to:

- Interrupt and contain the spread of communicable diseases within the community;
- Conduct surveillance for >80 communicable diseases and syndromes;
- Provide education to infected and exposed citizens;
- Facilitate appropriate treatment and preventive therapy;
- Enforce measures that protect the community (e.g. isolation); and
- Develop and advocate for policies to address priority health issues.

The Communicable Disease and Epidemiology Bureau is organized into four main program areas: **STD/HIV**, **Tuberculosis Control**, **Infectious Disease**, and **Disease Surveillance**.

STD/HIV Program

Sexually transmitted diseases (STDs) affect men and women of all ages, backgrounds, and economic statuses. The United States has made progress in identifying cases through better testing procedures, sexual partner testing & treatment, and risk-reduction education. There are still an estimated 20 million new cases of STDs acquired in the United States each year. Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), chlamydia, gonorrhea, syphilis, and chancroid are the STDs reportable by law in the state of Utah. Hospitals, laboratories, physicians, and clinics are mandated to report these diseases to the local health department.

The STD/HIV Program strives to ensure that infected individuals are interviewed by a trained communicable disease nurse to:

- Verify that appropriate treatment was prescribed and administered;
- Confidentially identify and notify contacts/partners of infected individuals who may have been exposed and facilitate testing and treatment; and
- Provide risk-reduction counseling and education.

Tuberculosis Control Program

The Davis County Tuberculosis (TB) Control Program is dedicated to the prevention, control, and elimination of TB disease and the identification and treatment of latent TB infection (LTBI).

The successful control of tuberculosis in Davis County is largely due to the following program activities:

- Early identification, isolation, and appropriate treatment of individuals suspected of or diagnosed with tuberculosis disease;
- Effective contact investigation activities to identify individuals exposed to TB and completion of medication therapy for those diagnosed with LTBI; and
- Targeted testing for those who are at higher risk for developing TB following an exposure (e.g. homeless, foreign-born, residents of correctional institutions, substance abusers).

Infectious Disease Program

Communicable diseases reportable in the state of Utah, with the exception of STDs and tuberculosis, fall under this program. Once reported, the Infectious Disease program implements the following activities:

- Interview infected individuals to obtain a thorough history, attempt to determine the source of exposure, and identify exposed contacts;
- Review and interpret laboratory results;
- Implement necessary control measures to interrupt disease transmission (e.g. exclusion from work/school);
- Monitor the disease process, assessing for changes in expected manifestations;
- Facilitate appropriate treatment and prophylaxis for those infected or exposed;
- Provide education on the specific disease and important preventive measures; and
- Formalize findings and report to the Utah Department of Health (UDOH).

The Infectious Disease Program has been further divided into the following categories:

- **Enteric Diseases:** bacterial, viral, and parasitic diseases involving the gastrointestinal tract
- **Vaccine-Preventable Diseases:** diseases that are preventable with vaccines
- **Vector-borne/Zoonotic Diseases:** diseases transmitted by insects, animals, or birds
- **Invasive Diseases:** bacterial or viral infections of the blood stream, cerebral spinal fluid (e.g. meningitis, encephalitis) or other normally sterile sites (e.g. synovial, pleural, or pericardial fluid)
- **Other reportable diseases/conditions:** diseases that do not fall under the above categories

Surveillance Program

The Surveillance Program is responsible for the systematic collection, analysis, and dissemination of data pertaining to infectious diseases of public health importance. The goal of the Surveillance Program is to provide statistics that prompt public health preventive action. Core functions of the Surveillance Program include:

- Providing medical professionals with access to disease reporting 24-hours a day/seven days a week
- Maintaining a computerized system for efficient storage and access to data
- Incorporating a variety of data sources including:
    - ◊ Notifiable disease reports
    - ◊ School absenteeism
    - ◊ Sentinel physician reports
    - ◊ Syndromic data
- Monitoring the occurrence and distribution of infectious disease activity
- Disseminating surveillance data to the public and medical professionals

Communicable diseases are reported to the local health department for investigation in accordance with the Utah Administrative Code (R386-702). Prompt reporting of confirmed and suspect cases helps ensure necessary control and preventive actions. All reports required by rule are confidential and are not open to public inspection.

Entities required to report confirmed or suspected diseases are physicians, hospitals, healthcare facilities, laboratories, schools, long-term care facilities, skilled nursing facilities, and daycares. All case reports should include:

- Disease
- Patient's name
- Patient's address
- Patient's telephone number
- Patient's date of birth
- Pertinent clinical information

REPORTABLE DISEASES

UTAH LAW REQUIRES THAT THE FOLLOWING DISEASES BE REPORTED TO YOUR LOCAL HEALTH DEPARTMENT OR THE UTAH DEPARTMENT OF HEALTH IMMEDIATELY.

Davis County Health Department Disease Reporting Line: (801) 525-5220

- **Anthrax*** (*Bacillus anthracis*) or anthrax-like illness caused by Bacillus cereus strains that express anthrax toxin genes
- **Botulism*** (*Clostridium botulinum*)
- **Cholera** (*Vibrio cholerae*)
- **Diphtheria*** (*Corynebacterium diphtheriae*)
- ***Haemophilus influenzae****, invasive disease
- **Hepatitis A**
- **Influenza infection, non-seasonal strain***
- **Measles*** (Rubeola virus)
- **Meningococcal disease*** (*Neisseria meningitidis*)
- **Plague*** (*Yersinia pestis*)
- **Poliomyelitis**, paralytic and non-paralytic
- **Rabies** (human and animal)
- **Rubella** (excluding congenital syndrome)
- **Severe Acute Respiratory Syndrome (SARS)**
- **Smallpox** (Variola virus)
- ***Staphylococcus aureus****†, with resistance (VRSA) to vancomycin isolated from any site
- **Transmissible spongiform encephalopathies (prion diseases) including Creutzfeldt-Jakob disease**
- **Tuberculosis*†** (*Mycobacterium tuberculosis*)
- **Tularemia*** (*Francisella tularensis*)
- **Typhoid***, cases and carriers
- **Viral hemorrhagic fevers**, e.g. *Ebola*, *Lassa*, *Marburg*, and *Nipah* virus-related illnesses
- **Unusual diseases or outbreaks of any kind and any exposure/infection that may indicate a bioterrorism event**

UTAH LAW REQUIRES THAT THE FOLLOWING DISEASES BE REPORTED TO YOUR LOCAL HEALTH DEPARTMENT OR THE UTAH DEPARTMENT OF HEALTH WITHIN 3 DAYS AFTER IDENTIFICATION.

Davis County Health Department Disease Reporting Line: (801) 525-5220

Or FAX (801) 525-5210

- **Acute flaccid myelitis (AFM)**
- **Adverse event resulting after smallpox vaccination** (Vaccinia virus)
- **Anaplasmosis** (*Anaplasma phagocytophilum*)
- **Arbovirus infection**, including Chikungunya, West Nile virus*, and Zika virus*
- **Babesiosis** (*Babesia*)
- **Botulism, infant*** (*Clostridium botulinum*)
- **Brucellosis*** (*Brucella* species)
- **Campylobacteriosis*** (*Campylobacter*)
- **Candida auris or haemulonii from any body site*†**
- **Carbapenem-resistant or carbapenemase-producing *Acinetobacter* species, *Enterobacter* species, *Escherichia coli*, and *Klebsiella* species*†**
- **Chagas disease**
- **Chancroid** (*Haemophilus ducreyi*)
- **Chickenpox** (Varicella-zoster virus)
- ***Chlamydia trachomatis* infection**
- **Coccidioidomycosis** (*Coccidioides*)
- **Colorado tick fever**
- **Cryptosporidiosis** (*Cryptosporidium*)
- **Cyclosporiasis** (*Cyclospora cayetanensis*)
- **Dengue fever**
- **Ehrlichiosis** (*Ehrlichia*)
- **Encephalitis or meningitis** (bacterial, fungal, parasitic, protozoan and viral)
- **Giardiasis** (*Giardia lamblia*)
- **Gonorrhea**, (*Neisseria gonorrhoeae*) sexually transmitted and ophthalmia neonatorum†
- **Hantavirus infection** (Sin Nombre virus)
- **Hemolytic Uremic Syndrome**, post-diarrheal
- **Hepatitis, viral**, including hepatitis B (acute, chronic, and perinatal), C (acute, chronic, and perinatal), D, and E
- **Human immunodeficiency virus (HIV) infection**, including perinatal and acquired immunodeficiency syndrome (AIDS) diagnosis
- **Influenza-associated hospitalization***
- **Influenza-associated death in a person less than 18 years of age**
- **Legionellosis*** (*Legionella*)
- **Leprosy** (Hansen's Disease)
- **Leptospirosis** (*Leptospira*)
- **Listeriosis*** (*Listeria monocytogenes*)
- **Lyme disease** (*Borrelia burgdorferi*)
- **Malaria** (*Plasmodium*)
- **Mumps**
- **Mycobacteria other than tuberculosis**
- **Pertussis** (*Bordetella pertussis*)
- **Pregnancies associated with Hepatitis B, Hepatitis C, HIV, *Listeria*, Rubella, Syphilis, or Zika virus infection even if disease was reported to public health prior to pregnancy**
- **Psittacosis** (*Chlamydophila psittaci*)
- **Q Fever** (*Coxiella burnetii*)
- **Relapsing fever, tick-borne and louse-borne** (*Borrelia*)
- **Rubella**, including congenital syndrome
- **Salmonellosis*†** (*Salmonella*)
- **Shiga toxin-producing *Escherichia coli* (STEC) infection***
- **Shigellosis*†** (*Shigella*)
- **Spotted fever rickettsioses, including Rocky Mountain spotted fever** (*Rickettsia*)
- **Streptococcal disease, invasive, due to *Streptococcus pneumoniae*† and Groups A and B**
- **Syphilis**, all stages, congenital, and syphilitic stillbirths
- **Tetanus** (*Clostridium tetani*)
- **Toxic-Shock Syndrome**, staphylococcal or streptococcal
- **Trichinellosis** (*Trichinella*)
- **Vibriosis*** (*Vibrio*), including Cholera

ELECTRONIC LABORATORY REPORTING (ELR)

Entities reporting via ELR have additional reporting requirements not listed on this document. Those requirements can be found under the "Information for Reporters" tab at http://health.utah.gov/epi/reporting or by contacting the Utah Department of Health at elr@utah.gov.

*Laboratories shall submit clinical material to the Utah Public Health Laboratory for all cases identified with these organisms, or any organism implicated in an outbreak when instructed by authorized local or state health department staff.
†Full panel susceptibility results, including minimum inhibitory concentration and results suppressed to the ordering clinician, are reportable when performed on the following organisms.

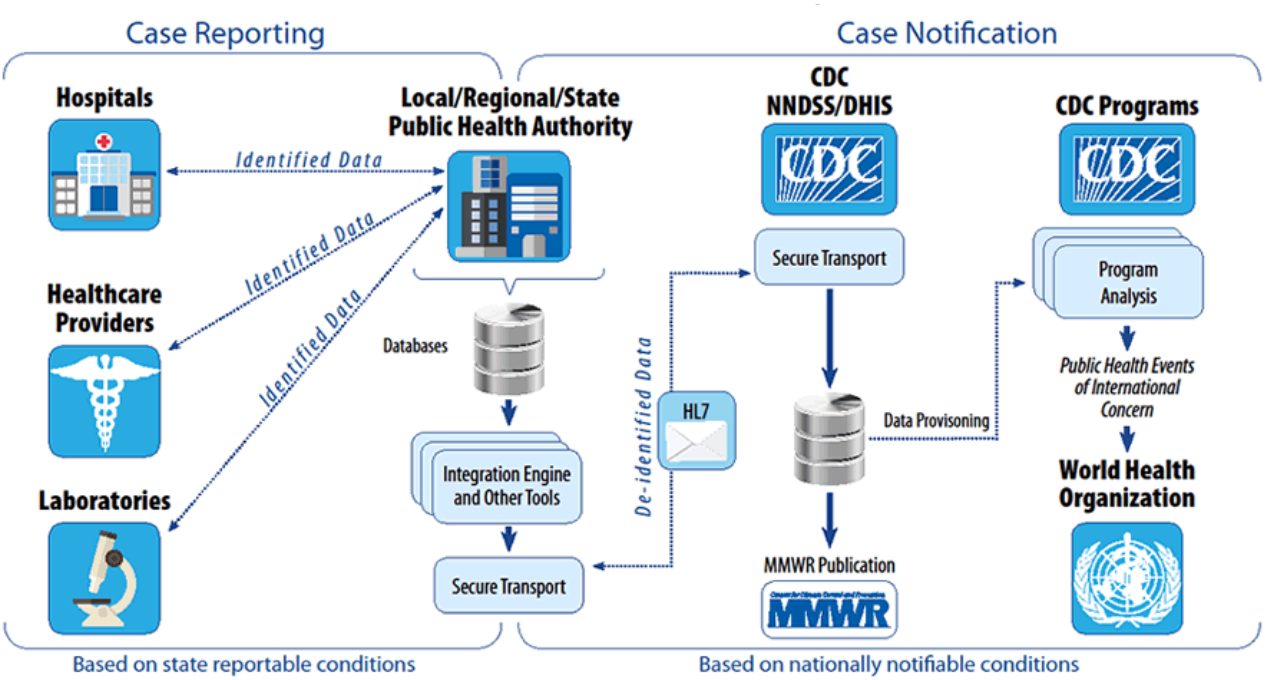
For questions about disease reporting, please contact Sarah Willardson by phone (801-525-5206) or by email (swillardson@co.davis.ut.us) or visit http://www.co.davis.ut.us/health/health-services/disease-control-services/healthcare-professionals-medical-providers

Davis COUNTY

Revised March 2018

Disease surveillance data received from several reporting sources, including hospitals, clinics, and laboratories is used to complete case investigations and minimize the spread of infectious disease (see Figure 1). Data retrieved during investigations of reported infectious disease cases is maintained in UT-NEDSS/EpiTrax—a secure, online database that allows epidemiologists and infectious disease investigators to access case information statewide. De-identified data is then shared with the Centers for Disease Control and Prevention (CDC) to meet additional reporting requirements and identify outbreaks.

FIgure 1. National Notifiable Disease Surveillance System Data Flow



Data acquired for cases reported during 2018 was exported into Microsoft Excel (2013) for further analysis. Descriptive statistics were also calculated in Microsoft Excel (2013).

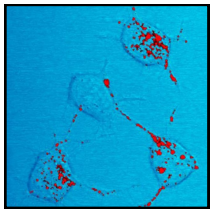
The most current available data estimates (2017) were used for city populations. These estimates were obtained from the U.S. Census Bureau's American Fact Finder at http://factfinder.census.gov in January 2019.

Population estimates by age group, gender, race, and ethnicity were available for 2017. These estimates were retrieved in January 2019 from the Utah Department of Health's (UDOH) Indicator-Based Information System for Public Health (IBIS-PH) available at http://ibis.health.utah.gov.

All incidence rates were calculated in Microsoft Excel (2013) and are expressed as the number of cases reported in 2018 per 100,000 people - with the exception of early-onset Group B *Streptococcus*, which is expressed as the number of cases per 1,000 live births. The incidence rates of all sexually transmitted diseases (STDs) by city were similarly calculated, after controlling for age. This was done to account for the increased prevalence of STDs among the young adult population.







Reportable Disease Summary

Disease morbidity and mortality have decreased over the past century, partly due to the partnership between private and public health care. Unfortunately, new and emerging diseases are surfacing, requiring additional efforts from both the medical community and public health. Existing pathogens are also increasing as our population increases. Disease affects all races, ethnicities, ages, and genders.

Davis County Health Department (DCHD) received a total of **2,319** disease reports during 2018, 9.0% more than the 2,128 disease reports received in 2017.

Over half (61.6%) of the diseases reported were sexually transmitted diseases, followed by vaccine-preventable diseases (11.7%), enteric diseases (7.6%), tuberculosis infections (7.0%), other diseases (6.0%), invasive diseases (5.6%), and vector-borne/zoonotic diseases (0.4%) (see Figure 2).

Cases were reported slightly more often among females (55.4%) than males (44.6%), and among 20-29 year olds (see Figure 3). Sexually transmitted diseases continued to have a significant impact on the 20-29-year old age group. Statistically, females are more frequently impacted by sexually transmitted diseases.

Figure 2. Diseases Reported by Type, Davis County, 2018

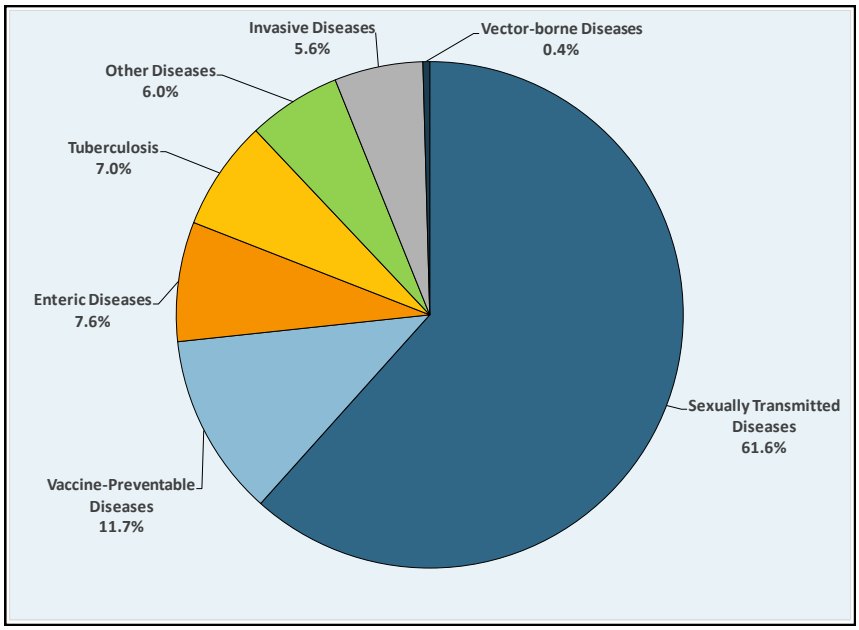


Figure 3. Disease Reports by Age Group and Gender, Davis County, 2018

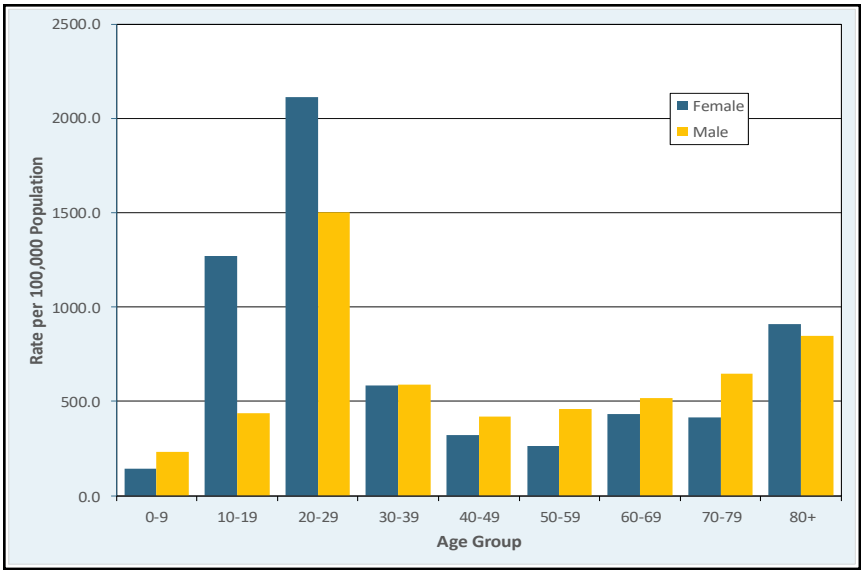
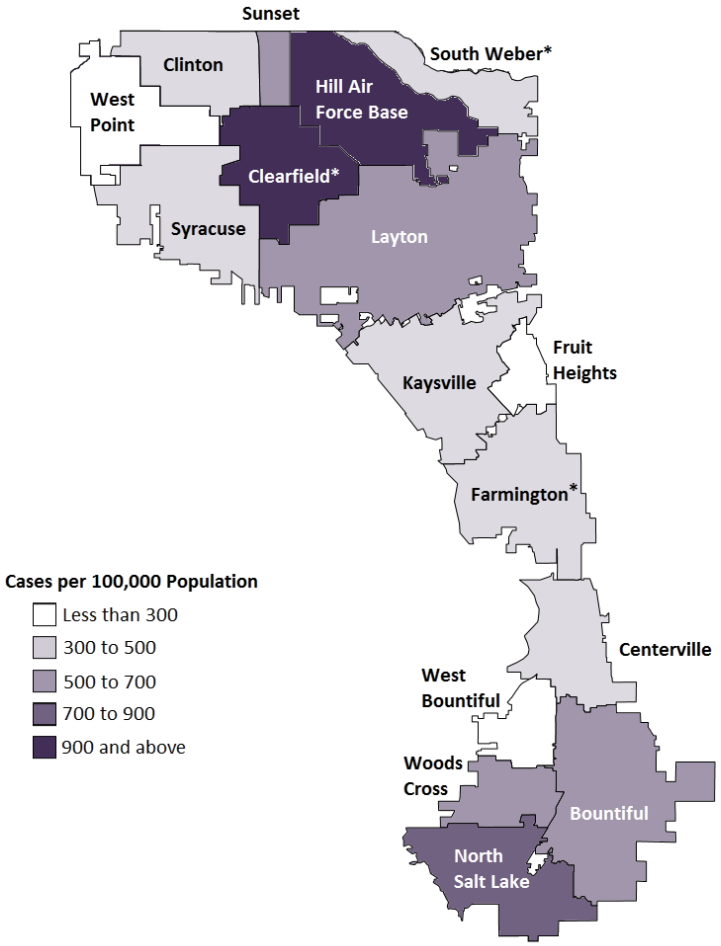


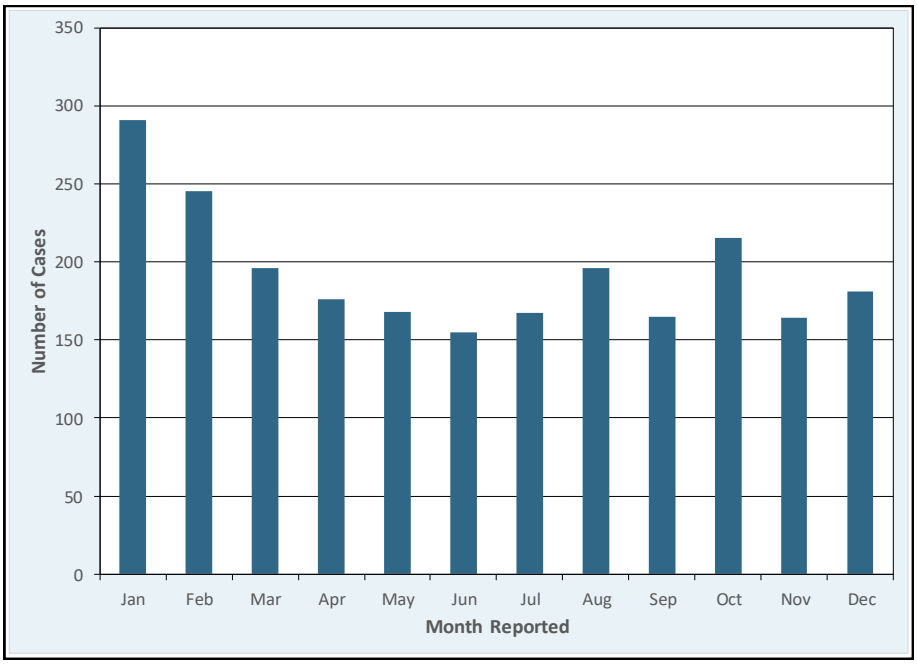
Figure 4. Incidence of All Reportable Diseases, Davis County, 2018



*These cities are impacted by temporary residential establishments (i.e. federal Job Corps Centers and correctional facilities)

Disease rates by city are identified by the place of residence of the affected individual at the time of diagnosis. These rates do not suggest that one city is better or worse than another, but simply describe the disease burden in each city (see Figure 4). Tuberculosis data are not included because most infections were acquired outside of Davis County. Hill Air Force Base and Clearfield had the highest rates of all reportable diseases among all cities, whereas West Point, West Bountiful, and Fruit Heights had the lowest rates.

Figure 5. Disease Reports by Month, Davis County, 2018



The disease burden in Davis County normally stays consistent throughout the year (see Figure 5). January 2018 had the highest number of disease reported. This is most likely due to the severe influenza season and the associated increase in hospitalized influenza cases. In 2018, an average of 193 diseases were reported each month.

Top 20 Diseases

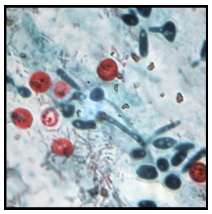
Table 1. Frequently Occurring Diseases in Davis County, 2018

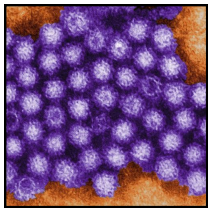
Rank	Disease	Number of Cases
1	Chlamydia	1,158
2	Gonorrhea	223
3	Influenza-Associated Hospitalization	178
4	Tuberculosis, Latent Infection	163
5	Hepatitis C, Acute & Chronic	118
6	Streptococcal Disease, Invasive	91
7	Campylobacteriosis	46
8	Salmonellosis	40
9	Pertussis	37
10	Syphilis, all stages	36
11	Norovirus	35
12	Viral/Aseptic Meningitis	30
13	Chickenpox	24
14	Hepatitis B, Acute & Chronic	23
15	Giardiasis	22
16	Shiga Toxin-Producing *E. coli* (STEC)	18
17	Carbapenem-Resistant Enterobacteriaceae (CRE)	12
17	HIV	12
19	Cryptosporidiosis	9
20	Hepatitis A	6

Table 2. Diseases Reported by Year, Davis County, 2013 - 2018

Disease	2013	2014	2015	2016	2017	2018	5 Yr Ave (2013 – 17)
Amebiasis	1	0	0	0	0	0	0.2
Botulism, infant	0	1	2	0	0	0	0.6
Campylobacteriosis	43	71	46	41	59	46	52.0
Carbapenem-Resistant Enterobacteriaceae (CRE)	3	7	9	14	19	12	10.4
Chickenpox	39	33	15	23	26	24	27.2
Chikungunya	*	*	2	1	0	1	1.0
Chlamydia	847	923	886	934	1,094	1,158	936.8
Coccidioidomycosis	3	3	4	7	5	3	4.4
Creutzfeldt-Jakob Disease (CJD)	0	2	1	0	1	1	0.8
Cryptosporidiosis	33	14	26	27	11	9	22.2
Cyclosporiasis	0	0	0	1	3	2	0.8
Dengue Fever	1	0	0	0	2	1	0.6
Encephalitis	0	0	2	1	0	1	0.6
Giardiasis	29	20	17	27	18	22	22.2
Gonorrhea	60	94	87	129	171	223	108.2
H. influenzae, invasive disease	3	4	2	6	5	4	4.0
Hansen's disease (Leprosy)	0	1	0	0	1	0	0.4
Hantavirus Pulmonary Syndrome (HPS)	0	0	0	1	0	0	0.2
Hepatitis A	3	2	0	1	4	6	2.0
Hepatitis B, acute & chronic	24	42	22	34	34	23	31.2
Hepatitis C, acute & chronic	189	189	132	166	130	118	161.2
Hepatitis E	0	0	1	0	0	0	0.2
HIV/AIDS	4	9	11	7	14	12	10.2
Influenza, hospitalized	82	130	83	133	122	178	110.0
Legionellosis	2	4	4	1	4	3	3.0
Leptospirosis	0	0	0	0	0	1	0.0
Listeriosis	2	1	0	1	0	0	0.8
Lyme disease	3	5	1	2	9	1	4.0
Malaria	0	0	2	0	0	2	0.4
Meningitis, aseptic/viral	10	21	14	7	24	30	15.2
Meningitis, bacterial & other	2	4	2	0	6	4	2.8
Meningococcal disease	1	1	0	0	0	0	0.4
Mumps	0	0	0	1	2	3	0.6
Norovirus	20	27	21	69	26	35	32.6
Pertussis	104	117	72	24	37	37	70.8
Q fever, chronic	1	0	0	0	0	1	0.2
Salmonellosis	49	33	58	42	41	40	44.6
Shiga toxin-producing *E. coli* (STEC)	12	9	18	11	13	18	12.6
Shigellosis	0	3	21	9	3	4	7.2
Spotted Fever Rickettsiosis	0	1	1	1	2	3	1.0
Streptococcal disease, invasive	73	67	87	87	100	91	82.8
Syphilis – all stages	20	14	14	19	23	36	18.0
Toxic-Shock Syndrome	0	1	2	4	3	1	2.0
Tuberculosis, active disease	1	0	0	2	3	0	1.2
Tuberculosis, latent infection	75	84	89	112	102	163	92.4
Vibriosis	0	0	1	0	2	1	0.6
West Nile virus infection	0	0	0	0	8	0	1.6
Zika virus	0	0	0	2	1	1	0.6
Total	**1,739**	**1,937**	**1,755**	**1,947**	**2,128**	**2,319**	**1, 903.2**







Enteric Diseases

Enteric infections enter the body through the mouth and intestinal tract and are usually spread through contaminated food and water or by contact with vomit or feces.

Figure 6. Enteric Diseases, Davis County, 2018

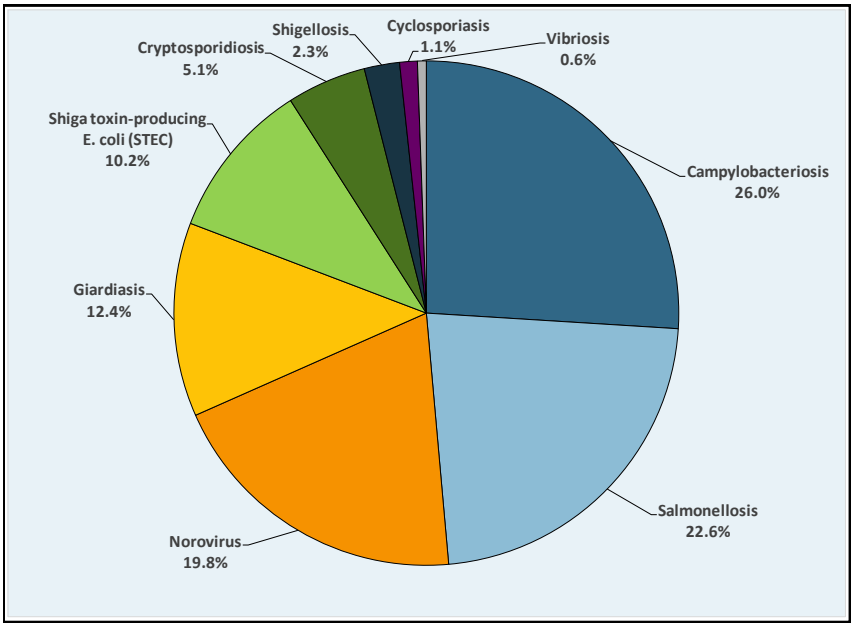
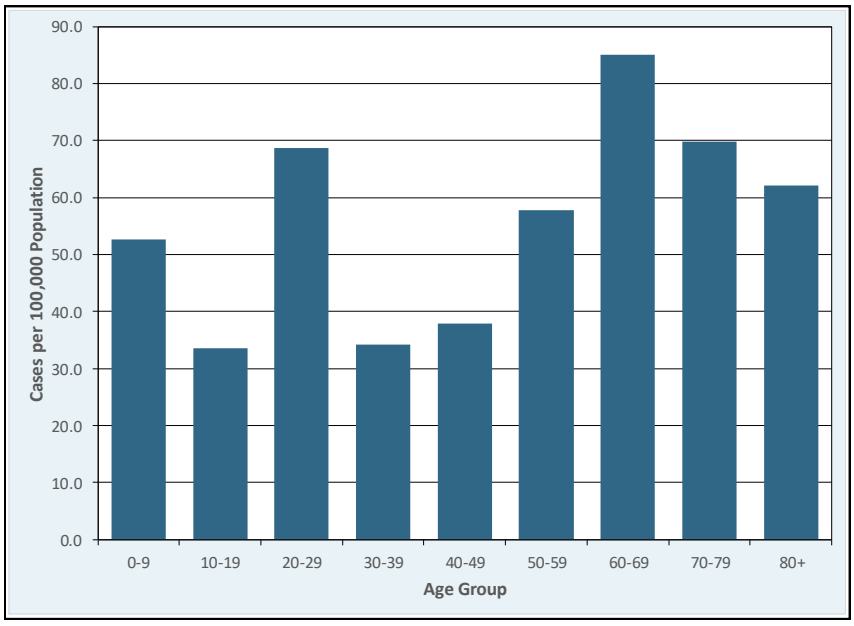


Figure 7. Incidence of Enteric Diseases by Age Group, Davis County, 2018

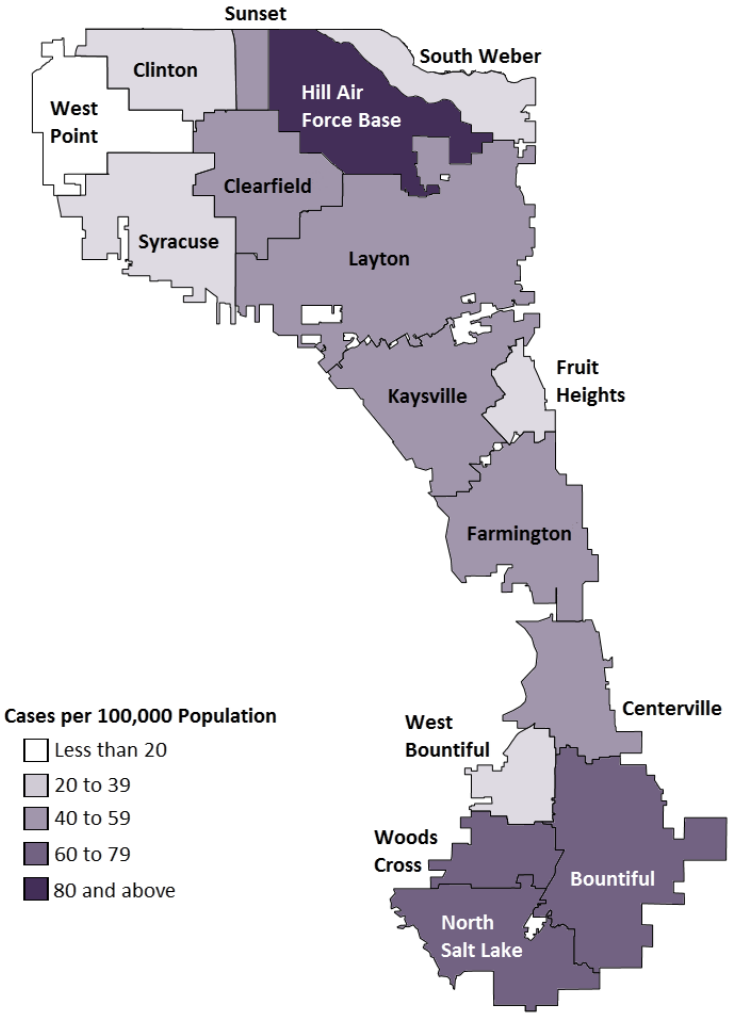


Enteric diseases are caused by bacterial, viral, or parasitic organisms that are shed in feces and can be spread person-to-person or through contaminated food and water. Enteric diseases are generally characterized by gastrointestinal symptoms such as nausea, vomiting, and diarrhea.

There were **177** enteric disease cases reported during 2018. Campylobacteriosis was the most frequently reported enteric disease with **46** cases (26.0%), followed by salmonellosis with **40** cases (22.6%), norovirus with **35** cases (19.8%), giardiasis with **22** cases (12.4%), Shiga toxin-producing *E. coli* (STEC) with **18** cases (10.2%), cryptosporidiosis with **nine** cases (5.1%), shigellosis with **four** cases (2.3%), cyclosporiasis with **two** cases (1.1%), and vibriosis with **one** case (0.6%) (see Figure 6).

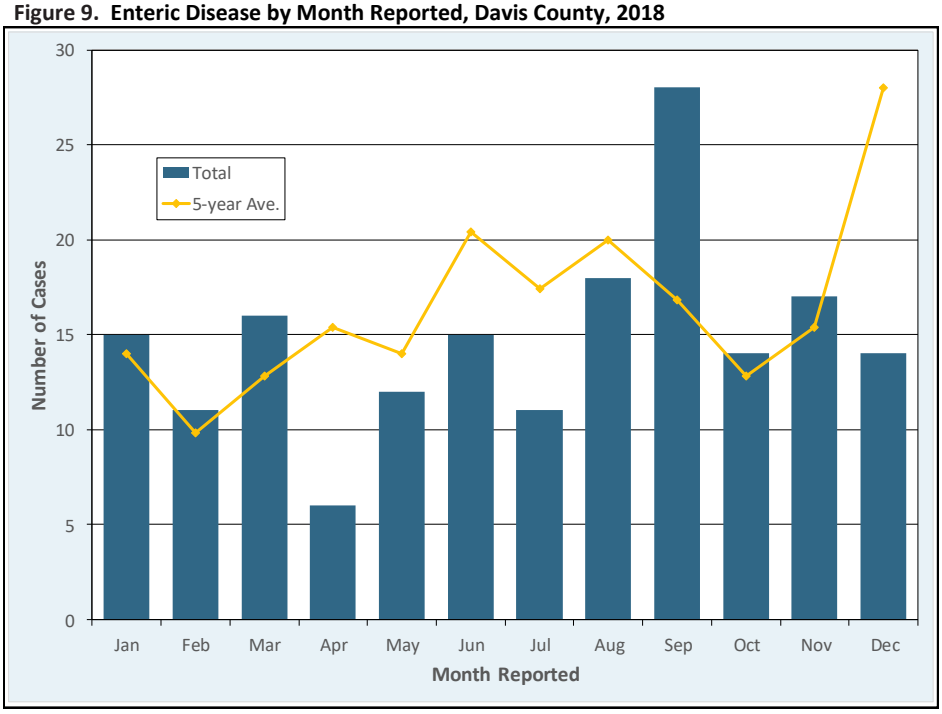
Just over half of the cases were female (50.3%) and rates of illness were highest among those between 60-69 years of age (see Figure 7). Enteric illnesses are typically more common among the elderly and other susceptible groups, including children and the immunocompromised.

Figure 8. Incidence of Enteric Diseases by City, Davis County, 2018



In 2018, enteric diseases were reported among residents of every city within Davis County. The rate by city varied, but the incidence rate of enteric diseases in Davis County during 2018 was 50.9 per 100,000 residents (see Figure 8). Hill Air Force Base had the highest rate of enteric illnesses, whereas West Point had the lowest.

Figure 9. Enteric Disease by Month Reported, Davis County, 2018



Enteric diseases are reported year-round, but a higher incidence is usually noted during the summer months (see Figure 9). In 2018, enteric illness peaked during September, due to increased circulation of norovirus across the Wasatch Front, as well as an increase of illness due to salmonellosis, which was linked to a nationwide outbreak.

Campylobacteriosis

2018 Overview

There were 46 cases of *Campylobacter* infection reported in Davis County in 2018.

No cases in Davis County were linked to a nationwide outbreak related to pet store puppies.

On average, Davis County has had lower rates of *Campylobacter* infection when compared to Utah.



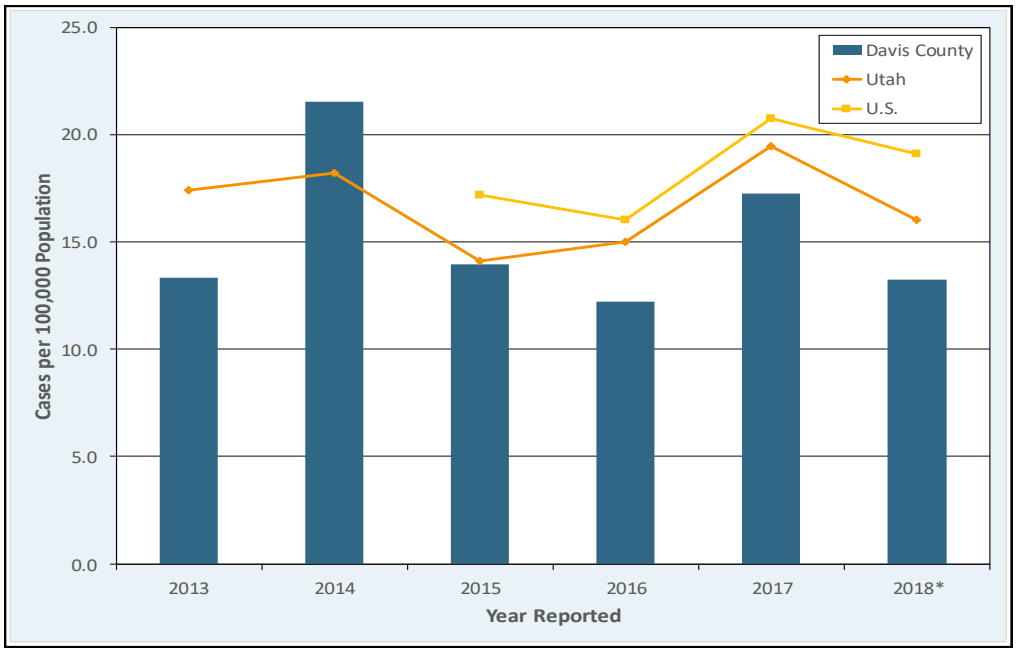
Campylobacter, one of the most common bacterial causes of diarrheal illness in the United States.

Campylobacteriosis is an infectious disease caused by bacteria of the genus *Campylobacter*. The bacteria are transmitted via the fecal-oral route. Improperly cooked poultry, untreated water, and unpasteurized milk are the most common sources of infection. *Campylobacter* is one of the most common bacterial causes of diarrheal illness in the United States. Virtually all cases occur as isolated or sporadic events and are not usually associated with an outbreak. Active surveillance through the Centers for Disease Control and Prevention (CDC) indicates that about 14 cases are diagnosed each year for every 100,000 persons in the population. Many more cases go undiagnosed or unreported, and campylobacteriosis is estimated to affect over 1.3 million persons every year.

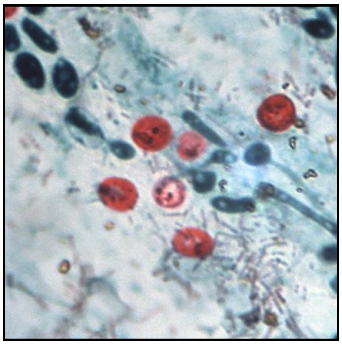
During 2018, there were **46** cases of campylobacteriosis reported in Davis County (see Figure 10). This corresponds to a 19.3% decrease from the 57 cases that were reported in 2017. One nationwide outbreak of *Campylobacter* related to contact with pet store puppies was identified in 2018. Utah had three cases related to this outbreak, none of which were Davis County residents.

When compared with the state of Utah, Davis County usually has lower rates of campylobacteriosis (see Figure 10). In 2014, however, Davis County's rate rose above the state's rate. This is most likely due to an outbreak of campylobacteriosis in Davis County that was linked to raw milk.

Figure 10. Incidence of Campylobacteriosis, Davis County, Utah, United States, 2013-2018



*Utah and United States 2018 data are provisional.



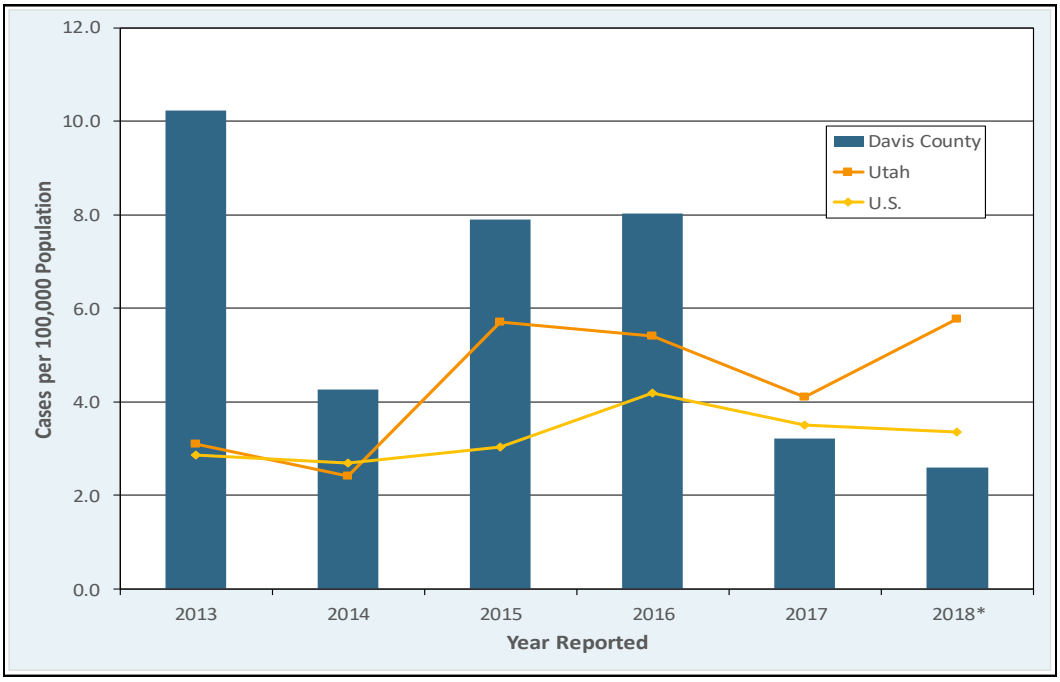
This micrograph of a direct fecal smear is stained to detect *Cryptosporidium*, a protozoan parasite.

Cryptosporidiosis is an infection caused by the protozoan organism *Cryptosporidium parvum*. *Cryptosporidia* have been found in many hosts, including humans, cattle and other domestic mammals. Infections may occur via person-to-person, fecal-oral, animal-to-person, or waterborne transmission. During the past two decades, cryptosporidiosis has become recognized as one of the most common causes of waterborne disease in humans in the United States. The parasite may be found in drinking water and recreational water in every region of the United States and throughout the world.

During 2018, Davis County had **nine** cases of cryptosporidiosis — an 18.2% decrease from 2017 when 11 cases were reported (see Figure 10). No outbreaks or clusters of illness were identified. Common exposures reported by cases included animal exposure, recreational water exposure, and international travel.

Historically, Davis County has had higher rates of cryptosporidiosis when compared to Utah and the United States (see Figure 11). In 2007, Utah experienced one of the largest cryptosporidiosis outbreaks in the United States with over 3,500 cases statewide, including nearly 300 in Davis County. These cases were largely associated with public swimming pools. Since that time, cases have greatly diminished due to the implementation of new control measures, including installation of UV light filters in several Davis County pool systems and effective public service announcements.

Figure 11. Incidence of Cryptosporidiosis, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.

2018 Overview

There were nine cases of cryptosporidiosis reported in Davis County in 2018.

Common exposures included animal exposure, recreational water exposure, & international travel.

The past two years, Davis County has had lower rates of cryptosporidiosis when compared to Utah and the United States.

Giardiasis

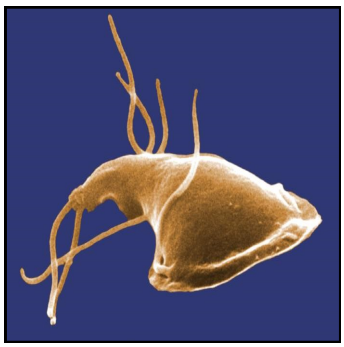
2018 Overview

There were 22 cases of giardiasis reported in Davis County in 2018.

Common exposures include recreational water, outdoor activities, and international travel.

Historically, when compared to the state of Utah, Davis County typically has a lower rate of giardiasis.

Giardiasis is caused by *Giardia lamblia*, a microscopic parasite that causes diarrheal illness. *Giardia* is found on surfaces or in soil, food, or water that has been contaminated with fecal matter from infected humans or animals. Humans and other mammals (especially beavers, dogs, and cats) are reservoirs and shed the organism in their stool.



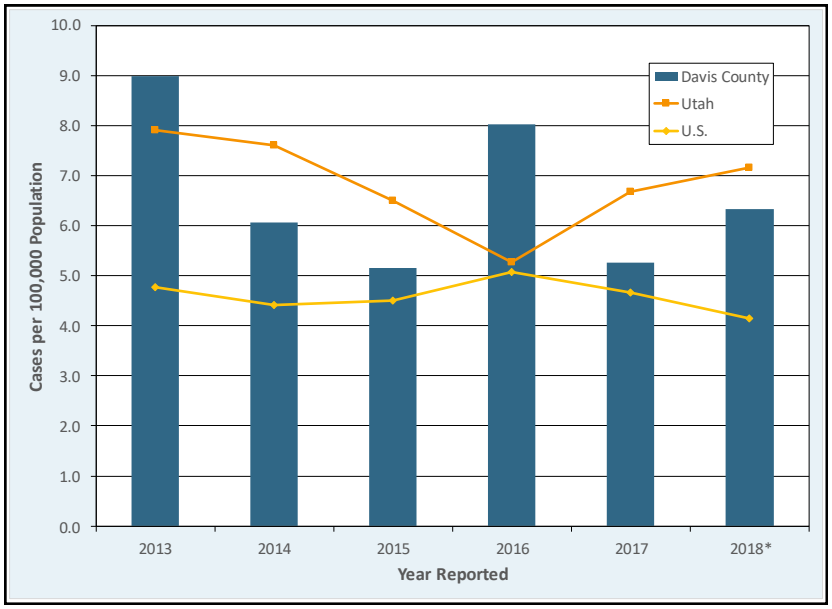
Giardia is a microscopic parasite that causes the diarrheal illness known as giardiasis.

Giardia is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it tolerant to chlorine disinfection. While the parasite can be spread in different ways, water (either drinking or recreational) is the most common mode of transmission.

Persons with giardiasis are infectious to others for the entire period of their illness, which can be weeks or months. Severity of disease varies from no symptoms to chronic diarrhea. Giardiasis tends to have intermittent symptoms, thus individuals may seek medical attention months after the initial infection occurred.

During 2018, there were **22** cases of giardiasis reported in Davis County, a 22.2% increase from the 18 cases reported in 2017 (see Figure 12). No outbreaks of giardiasis were investigated in Davis County during 2018. Common exposures reported by cases included recreational water, outdoor activities, and international travel. In Utah (including Davis County), cases of giardiasis typically peak in the summer and early fall months, coinciding with more outdoor recreation and potential exposures to *Giardia lamblia*.

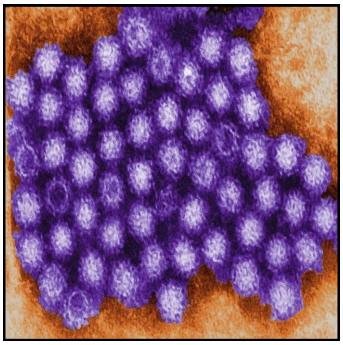
Figure 12. Incidence of Giardiasis, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.

When compared to the state of Utah, Davis County traditionally has lower rates of giardiasis (see Figure 12). Davis County Health Department continues to conduct disease surveillance to identify cases and/or clusters, determine the source of infection, and prevent further transmission.

Noroviruses are named after the original strain "Norwalk virus," which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio, in 1968. There are at least five known norovirus geno-groups, which in turn are divided into at least 31 genetic clusters. Noroviruses are transmitted primarily through the fecal-oral route, by consumption of fecal-contaminated food/water or by direct person-to-person contact. Environmental and fomite contamination are also sources of infection. Evidence exists of transmission via aerosolization of vomitus resulting in droplets contaminating surfaces or entering the oral mucosa and then swallowed. No evidence suggests that infection occurs through the respiratory route. The Centers for Disease Control and Prevention estimates that 19-21 million cases of acute gastroenteritis due to norovirus infection occur each year. Norovirus is the leading cause of foodborne illness in the United States and is responsible for about 50% of foodborne disease outbreaks due to known agents.



Norovirus is a very contagious virus. Norovirus can be spread from an infected person, contaminated food or water or by touching contaminated surfaces.

Due to the short duration of illness (typically 24 hours) and the self-limited, mild-to-moderate manifestation, persons infected with norovirus often do not seek medical care. Those who do are rarely tested for norovirus because testing is not widely available. As a result, many outbreaks are not identified. When suspect cases are reported to the health department, they are often received after the patient has recovered or late into the illness, making it difficult to confirm a diagnosis.

During 2018, there were **35** cases of norovirus reported in Davis County residents. This is a 34.6% increase from 2017, when there were 26 cases reported. In September 2018, an increase in norovirus cases was identified along the Wasatch Front. In adjacent counties, hundreds of students stayed home from school. Local news media also picked up the story and spread undue concern (see Figure 13). While there was some concern in Davis County, due to its contagious nature, only a nominal increase in cases was identified.

Figure 13. Local News Story, Norovirus in Schools, 2018



2018 Overview

A total of 35 cases of norovirus were reported in Davis County during 2018.

An increase in norovirus reports affected the majority of the Wasatch Front in fall of 2018.

Norovirus is the leading cause of foodborne illness in the United States.

Salmonellosis

2018 Overview

There were 40 cases of salmonellosis reported in Davis County in 2018.

Salmonella Typhimurium was the most commonly reported strain.

Davis County traditionally has lower rates of salmonellosis when compared to the United States.

Salmonellosis is a bacterial infection generally transmitted through ingestion of contaminated food or water. Salmonellosis can also be transmitted by direct contact with an infected human or animal. *Salmonella* bacteria are commonly found in food products and can be carried by many domestic animals. The Centers for Disease Control and Prevention estimates that approximately 1.2 million illnesses due to salmonellosis occur in the United States every year and is more common in summer than in winter. Young children, the elderly, and those who are immunocompromised are most likely to have severe infections. It is estimated that approximately 450 persons die each year from salmonellosis.



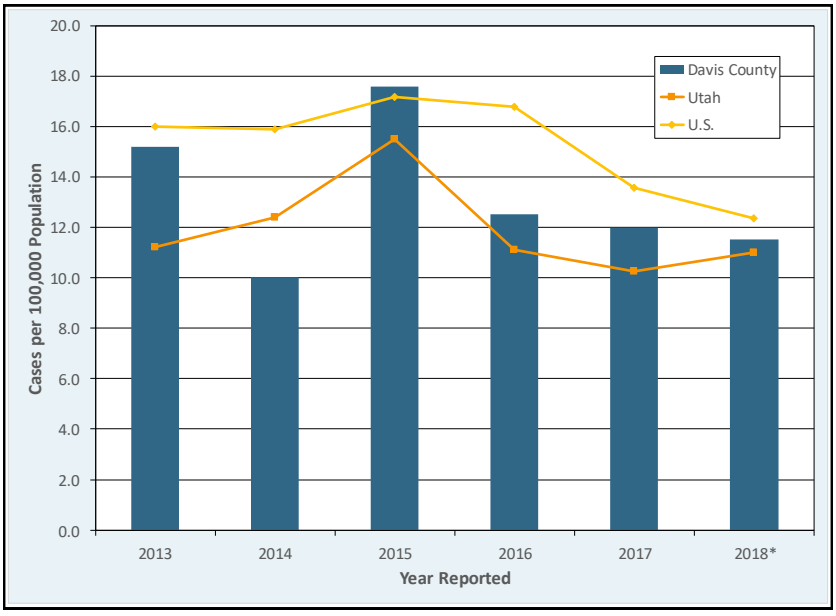
Salmonella is a bacteria that was discovered by an American scientist named Dr. Salmon and has been known to cause illness for over 125 years.

During 2018, there were **40** cases of salmonellosis reported in Davis County, a 2.4% decrease from the 41 cases reported in 2017 (see Figure 14). A few clusters of salmonellosis in Davis County were associated with national outbreaks in 2018.

Because of the many different strains of *Salmonella*, determining the serotype and Pulse-Field Gel Electrophoresis (PFGE) pattern of *Salmonella* isolates is critical in identifying sources and epidemiological links among cases. Serotypes are conventionally named after the city where they were discovered. Private laboratories are required to submit *Salmonella* isolates to the Utah Public Health Laboratory (UPHL) for serotyping and PFGE analysis. PFGE patterns are compared with other Utah and U.S. *Salmonella* isolates to identify possible clusters and suspect sources.

Salmonella Typhimurium was the most commonly reported *Salmonella* serotype during 2018. *Salmonella* Enteritidis and *Salmonella* Newport also had a significant presence in Davis County in 2018. Additional serotypes were reported in 2018, but were not as common (see Table 3).

Figure 14. Incidence of Salmonellosis, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.

Table 3. Salmonellosis Serotypes, Davis County, 2018

Serotype	Number of Cases (%)
Typhimurium	7 (17.5%)
Enteriditis	6 (15.0%)
Newport	5 (12.5%)
Infantis	4 (10.0%)
Montevideo	2 (5.0%)
Paratyphi B [1], 4, [5], 12:b:1,2	2 (5.0%)
Saintpaul	1 (2.5%)
Javiana	1 (2.5%)
Oranienburg	1 (2.5%)
Agona	1 (2.5%)
IIIb 61:k:1,- & IIIb 53:z10:z	1 (2.5%)
Muenchen	1 (2.5%)
Mbandaka	1 (2.5%)
Unknown	7 (17.5%)
Total	**40 (100.0%)**

Figure 15. *Salmonella* Newport Cases related to Ground Beef Outbreak, by State, United States, 2018

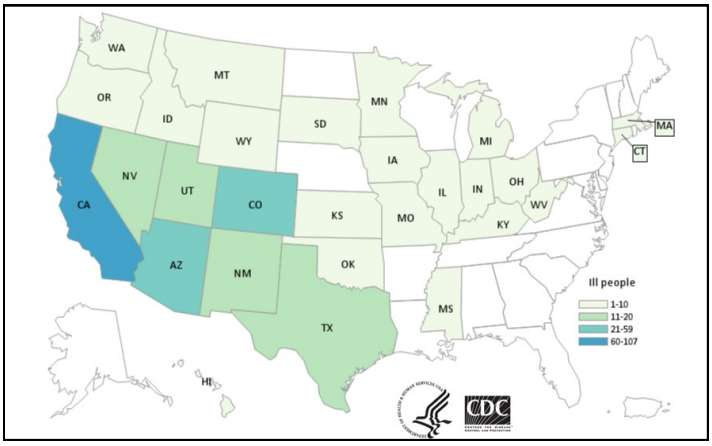
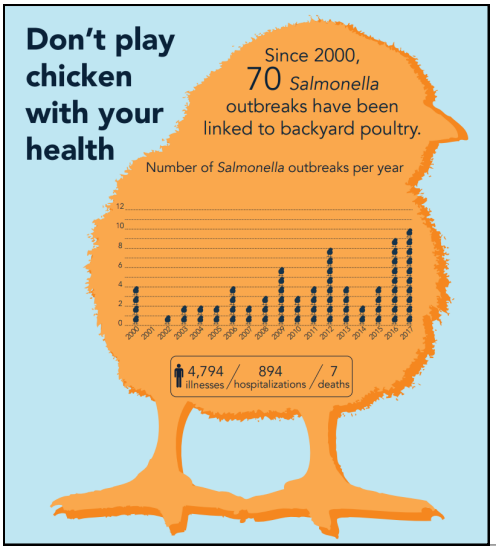


Figure 16. CDC Educational Material Regarding Live Poultry, 2018



Several clusters of salmonellosis were investigated in Davis County and Utah during 2018.

Salmonella Newport

A multistate outbreak of *Salmonella* Newport was identified during 2018. This outbreak was determined to be linked to contaminated ground beef. The ground beef was recalled by the distributor and affected several Utah retailers. As of December 2018, a total of 333 people from 28 states were infected, including four Davis County residents (see Figure 15).

Salmonella Mbandaka

CDC and the U.S. Food and Drug Administration (FDA) investigated a multistate outbreak of *Salmonella* Mbandaka during 2018. Epidemiologic and laboratory evidence indicated that Kellogg's Honey Smacks cereal was likely the source of this outbreak. Although the Mbandaka case in Davis County was not linked to this outbreak, three other Utah cases were associated.

Kratom Products Linked to *Salmonella* Infections

In 2018, Utah officials played a crucial role in investigating a multistate outbreak of *Salmonella* related to kratom products, as several distributors are located within the state. Kratom is a plant consumed for its stimulant effects and use as an opioid substitute. At the conclusion of this outbreak in May 2018, there were 199 people from 41 states who had been infected with various outbreak strains of *Salmonella* related to the kratom products. Three related cases were reported in the state of Utah.

Salmonella Infections Linked to Live Poultry in Backyard Flocks

Salmonella outbreaks of various strains continue to be associated with live poultry in backyard flocks across the United States. Although the number of associated cases in 2018 decreased nationwide when compared to 2017, CDC is continuing their campaign to educate people who have backyard flocks of live poultry (see Figure 16).

Shiga Toxin-Producing *Escherichia coli* Infection

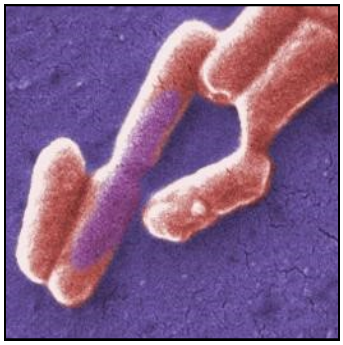
2018 Overview

There were 18 cases of STEC infection reported in Davis County in 2018.

No deaths and two hospitalizations were associated with STEC in Davis County in 2018.

Two national outbreaks linked to romaine lettuce were identified in 2018.

Escherichia coli (E. coli) are bacteria that normally live in the intestines of humans and animals. Certain strains of *E. coli*, including O121, O11, O26, and O157:H7 produce Shiga toxins that can cause hemorrhagic colitis, manifested as bloody stools. The most serious complication of the infection is Hemolytic Uremic Syndrome (HUS), which can lead to permanent kidney damage or death.



E. coli bacteria normally live in the intestines of people and animals. Most *E. coli* are harmless and actually are an important part of a healthy human intestinal tract.

Sources of transmission include consumption of undercooked, contaminated ground beef and other beef products, unpasteurized milk, drinking or swimming in water that is contaminated with sewage, or eating unwashed fruits or vegetables. Person-to-person transmission can easily occur within households, childcare centers, and long-term care facilities. Due to the potential severity of Shiga toxin-producing *E. coli* (STEC) and the fact that it spreads easily, public health investigates all reported cases thoroughly.

In 2018, there were **18** cases of STEC infection reported in Davis County, an increase of 38.5% from the 13 cases reported in 2017 (see Figure 17). The most common strain reported in Davis County was O26 with six cases. Other strains identified included O157:H7, O103, and O111 (see Table 4).

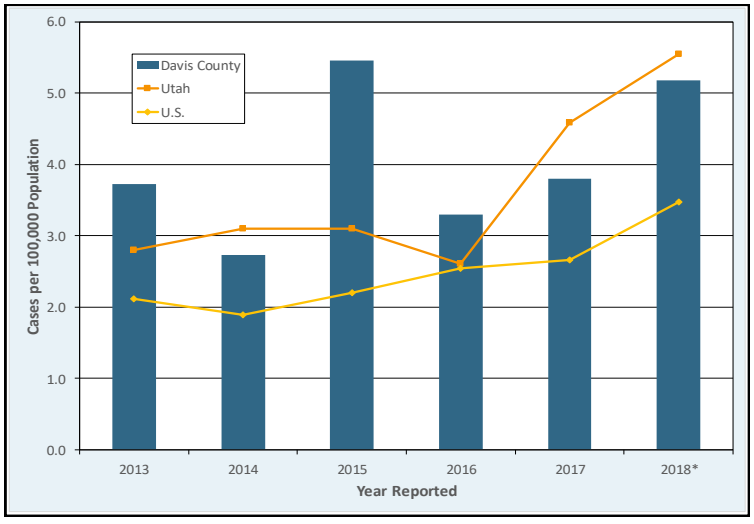
Only two of the cases were hospitalized and no HUS or deaths were reported. Possible exposures reported by patients included contact with animals, recreational water, and outdoor activities.

In 2018, there were two national outbreaks linked to romaine lettuce. Although no Davis County cases were linked to these outbreaks, recalls affected Utah consumers and distributors.

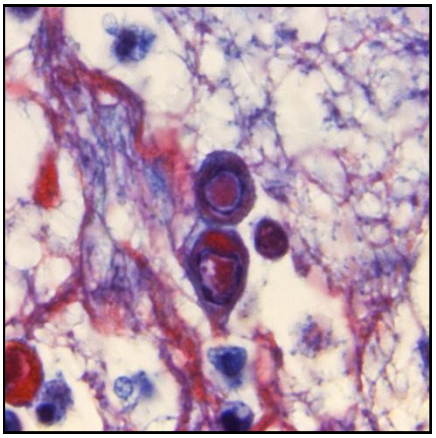
Table 4. Shiga Toxin-Producing *E. coli* Serotypes, Davis County, 2018

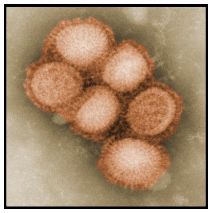
Serotype	Number of Cases (%)
O26	6 (33.3%)
O157:H7	4 (22.2%)
O103	2 (11.1%)
O111	1 (5.6%)
Unknown	5 (27.8%)
Total	**18 (100.0%)**

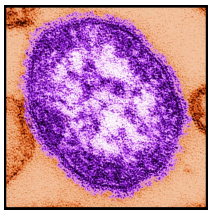
Figure 17. Incidence of STEC Infections, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.







Vaccine-Preventable Diseases

Vaccine-preventable diseases are infectious diseases for which an effective preventive vaccine exists.

Vaccine-Preventable Diseases (VPDs) are diseases that are preventable through the use of immunizations. Historically, VPDs caused a great deal of morbidity and mortality in children. Rates of VPDs have dramatically declined in large part because of immunizations. Yet worldwide each year, 22.6 million children do not receive basic vaccines and more than 3 million people die of vaccine-preventable diseases. Immunizations are the most effective step in protecting the community against VPDs. These diseases still occur, however, because of importation, vaccine failure or disease breakthrough, and incomplete or no vaccinations.

When a VPD is diagnosed, it is important that public health measures be quickly implemented to contain the spread. These measures include the administration of prophylactic medications and vaccines, isolation of the infected individual, quarantine of exposed individuals, and public education.

In 2018, hospitalized influenza was the most commonly reported VPD with **178** cases (65.7%), followed by pertussis with **37** cases (13.7%), chickenpox with **24** cases (8.9%), hepatitis B with **23** cases (8.5%), hepatitis A with **six** cases (2.2%), and mumps with **three** cases (1.1%) (see Figure 18).

The incidence of vaccine-preventable diseases is typically highest among the elderly and children (see Figure 19). Influenza especially affected the elderly population during the 2017-18 season.

Figure 18. Vaccine-Preventable Diseases, Davis County, 2018

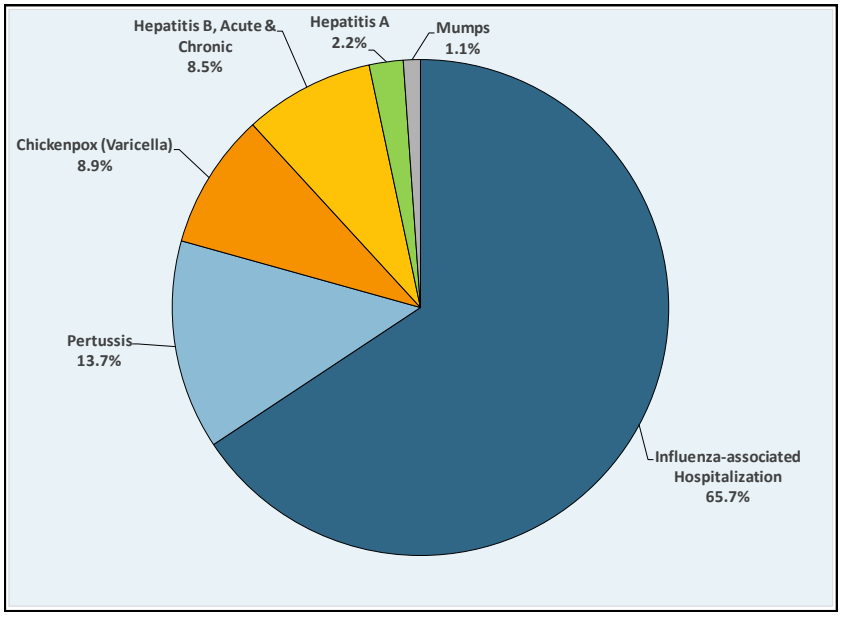


Figure 19. Incidence of VPDs by Age Group, Davis County, 2018

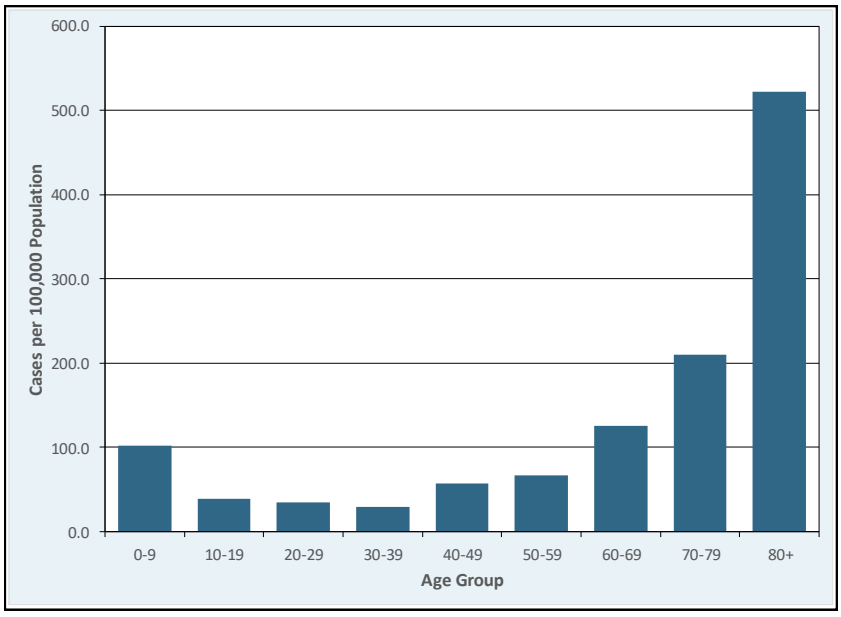
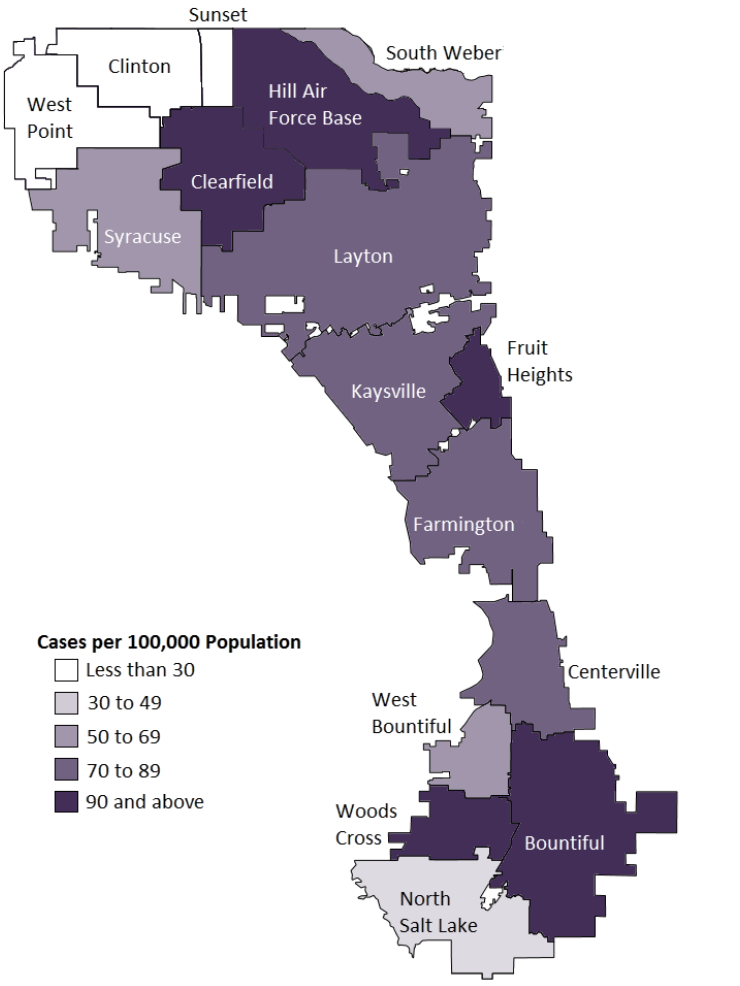
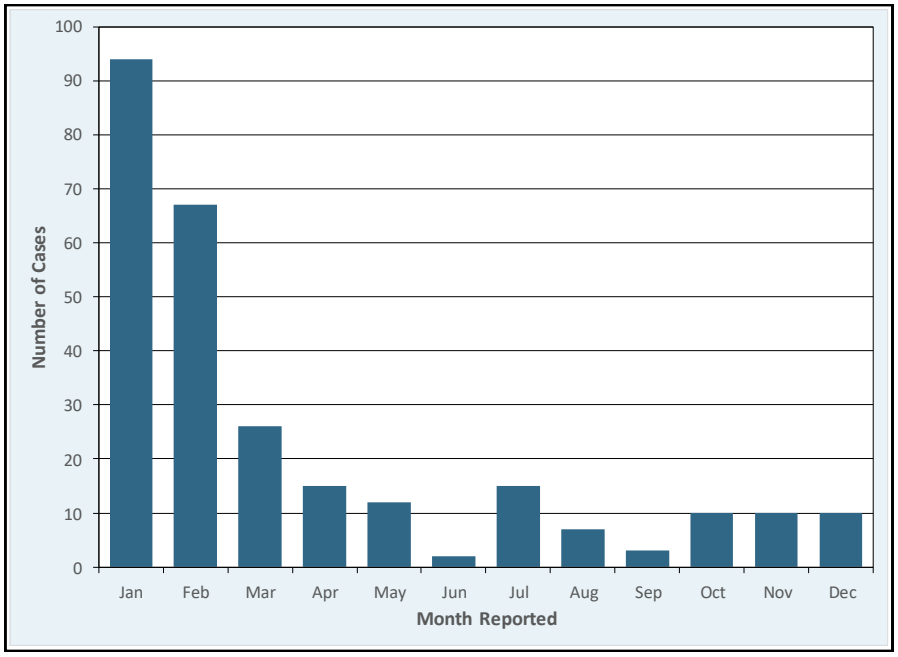


Figure 20. Incidence of Vaccine-Preventable Diseases by City, Davis County, 2018



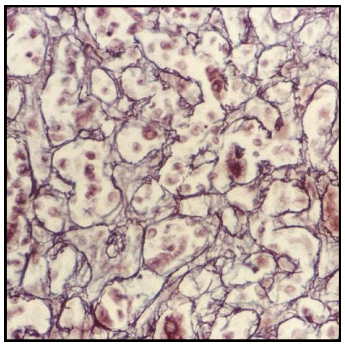
Vaccine-preventable diseases occurred among residents of every city throughout the county, with the exception of West Point (see Figure 20). The city with the highest incidence was Hill Air Force Base. In contrast, West Point, Clinton, and Sunset had the lowest incidence of vaccine-preventable diseases. The incidence rate of VPDs in Davis County through 2018 was 78.0 cases per 100,000 residents.

Figure 21. Vaccine-Preventable Disease by Month Reported, Davis County, 2018



Vaccine-preventable diseases (particularly pertussis and chickenpox) are usually reported more frequently during the school year. Influenza season typically begins in December and peaks during January or February. The 2017-18 influenza season was no exception (see Figure 21).

Hepatitis A is a disease caused by the hepatitis A virus, which targets the liver. It is transmitted via the fecal-oral route either by person-to-person contact or by consumption of contaminated food or water. Hepatitis A is highly contagious and is best prevented through vaccination.



Hepatitis A is a liver infection caused by the hepatitis A virus (HAV). It is highly contagious and can be transmitted by the fecal-oral route.

Since 1999, when routine vaccination was recommended for children living in states with high incidence (including Utah), the rates of hepatitis A have steadily declined (see Figure 22). In recent years, however, there has been a resurgence of the disease due to outbreaks among high-risk populations.

Since early 2017, Utah has been impacted by a national outbreak of hepatitis A. As of January 2019, Utah has 281 confirmed hepatitis A cases that are associated with this outbreak (see Figure 23). These cases have primarily been identified in high-risk groups, such as those who are homeless and/or using illicit drugs. The majority of cases associated with Utah's outbreak have been identified in Salt Lake (69.4%) and Utah (16.0%) counties. In 2018, Davis County had **six** cases of hepatitis A reported, five of which were linked to the outbreak. One additional Davis County case was linked to the outbreak in 2017.

Figure 22. Incidence of Hepatitis A, United States, 2001-2016

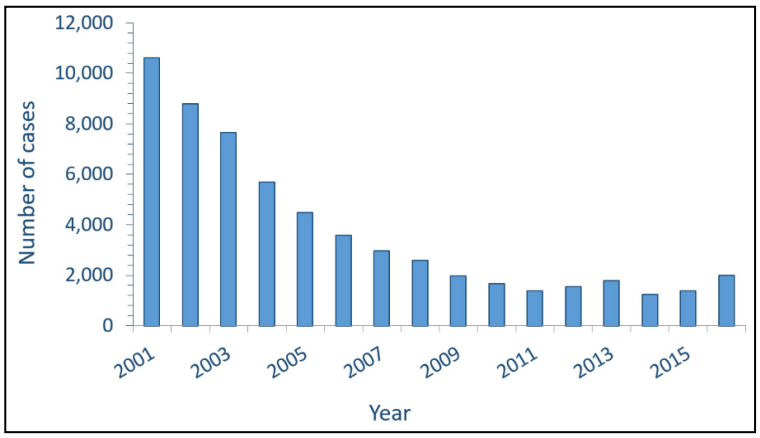
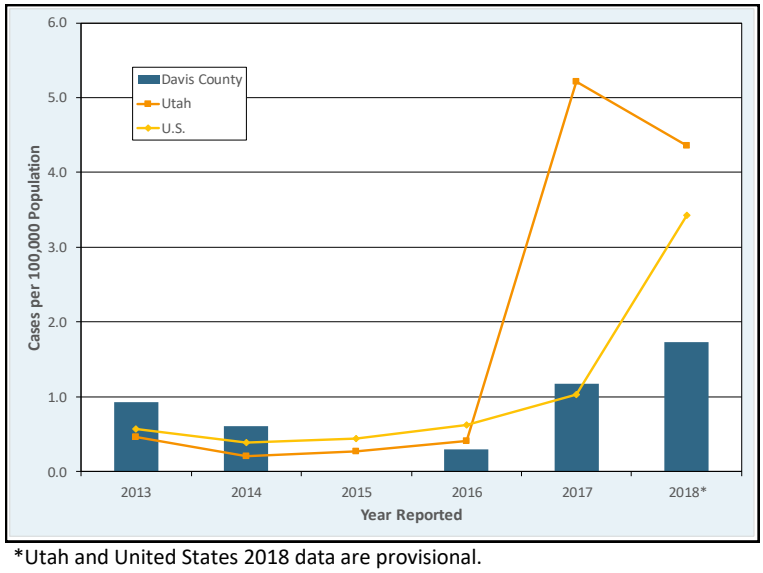


Figure 23. Incidence of Hepatitis A, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.

Throughout 2018, DCHD has also been involved in outbreak response through a variety of other activities. These include prophylactically treating several contacts potentially exposed at restaurants, coordinating outreach efforts to food handlers, and vaccinating at-risk individuals at several local drug treatment centers.

2018 Overview

There were six cases of hepatitis A reported in Davis County in 2018.

Since 2017, Utah has had 281 cases of hepatitis A associated with a national outbreak.

Six Davis County cases have been linked to the statewide outbreak.

Hepatitis B

2018 Overview

There were 23 cases of hepatitis B reported in Davis County in 2018.

In 2018, 10 pregnant women were referred to DCHD's Perinatal Hepatitis B Prevention Program.

As many as 90% of infants who acquire HBV infection from their mothers at birth become chronically infected.

Hepatitis B is a vaccine-preventable disease caused by the hepatitis B virus (HBV). It is transmitted through blood or body fluids. Common modes of transmission include percutaneous and permucosal exposure to infectious body fluids, sharing needles or syringes, sexual contact with an infected person, and perinatal exposure from an infected mother. In the United States, an estimated 850,000 to 2.2 million persons have chronic HBV infection. Acute HBV infection occurs most commonly among adolescents and adults in the United States.



The mission of the Perinatal Hepatitis B Prevention Program is to increase identification and treatment of women, their infants, and household contacts that are positive for the hepatitis B virus.

As many as 90% of infants who acquire HBV infection from their mothers at birth become chronically infected. Of children who become infected with HBV between 1-5 years of age, 25-50% become chronically infected. The risk drops to 6-10% when a person is infected over 5 years of age.

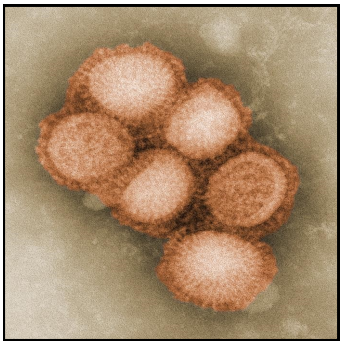
During 2018, there were **23** cases of hepatitis B reported in Davis County. None of these cases were determined to be acute infections. Several of these cases were at high risk for infection (e.g. foreign born, intravenous drug users, sexual/household exposure to a positive contact).

Perinatal Hepatitis B Prevention Program

The Perinatal Hepatitis B Prevention Program is responsible for the case management (evaluation, monitoring, testing, and treatment) of all positive reported cases among pregnant females in Davis County. Prior to the baby's birth, arrangements are made with the delivering hospital to administer hepatitis B immune globulin (HBIG) and the first dose of hepatitis B vaccine to the newborn within 12 hours after delivery, in an effort to prevent the newborn from acquiring the virus. The newborn is monitored until all three doses of vaccine have been administered. After vaccination, serology testing is conducted to ensure antibody protection. If the infant is a non-responder to the vaccine, a second series is given. Testing is repeated at completion of the second series. Women, who are prenatally tested and determined to be chronic hepatitis B carriers, are interviewed to identify close contacts. Identified contacts (sexual partners, household contacts, and children) are recommended to have testing to determine their infection status. If serology testing is negative, the hepatitis B vaccination series is encouraged. The case management of pregnant females in this program can range from 8-18 months.

In 2018, **10** pregnant women were referred to Davis County Health Department's Perinatal Hepatitis B Prevention Program.

Influenza is an acute respiratory infection caused by RNA viruses from the *Orthomyxoviridae* family. Humans are the primary reservoir for human influenza, but many influenza species can also infect birds and mammals. Influenza is transmitted via respiratory droplets and direct contact.



Flu is a contagious respiratory illness caused by influenza viruses. It can cause mild to severe illness.

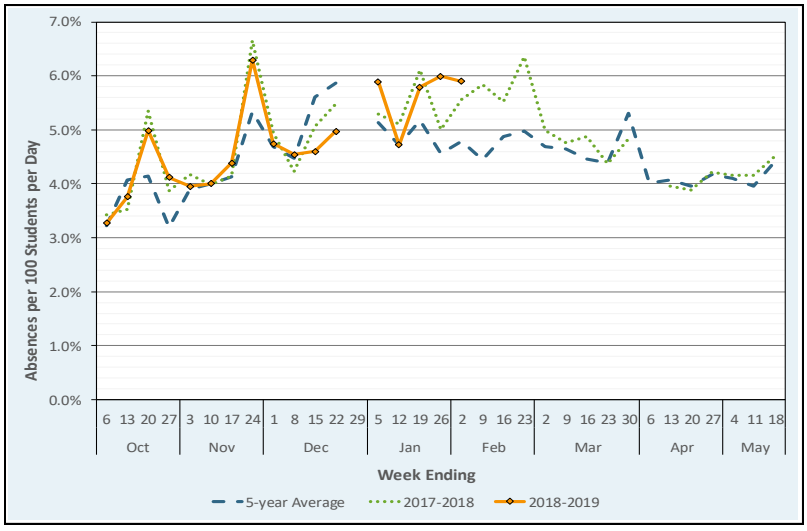
Because of the large number of cases that occur each season, traditional surveillance methods are impractical for influenza. Therefore, the disease is monitored using a variety of mechanisms. One method is through the use of sentinel sites. Davis County tracks physician visits for influenza-like illness (fever ≥100° F with a cough and/or sore throat) at sentinel sites throughout the county. These sites report data weekly to identify when influenza season peaks and monitor the burden of disease in the county. During the 2017-18 influenza season, four sentinel sites reported data to DCHD and Utah Department of Health.

Hospitals and other clinics submit specimens for influenza testing/typing to the Utah Public Health Laboratory (UPHL) so that circulating strains can be identified.

In addition, medical providers, hospitals, and laboratories are required by state law to report hospitalized influenza cases and pediatric influenza deaths to the local health departments. These two levels of reporting help public health evaluate disease severity, which is another important aspect of surveillance.

Davis County Health Department also partners with Davis School District to monitor elementary school absentee data. When schools experience a higher than expected absentee rate, the district is notified and an investigation is conducted to determine the cause. Increases in absenteeism are often observed when influenza season peaks (see Figure 24).

Figure 24. Elementary School Absenteeism—Davis County, 2018-19, 2017-18, 5-Year Average



DCHD publishes a *Weekly Influenza Report* every Thursday during peak influenza season. These reports provide a current view of influenza activity in Davis County, Utah, and the United States. These reports are available on our website at: http://goo.gl/7P63qq.

2018 Overview

A total of 202 hospitalized-influenza cases were reported during the 2017-18 influenza season.

In the 2017-18 season, the most common circulating virus was influenza A (H_3).

Thus far, the current influenza season (2018-19) has been moderately severe.

Figure 25. Hospitalized Influenza Cases by Month, Davis County, Jan 2012—Jan 2019

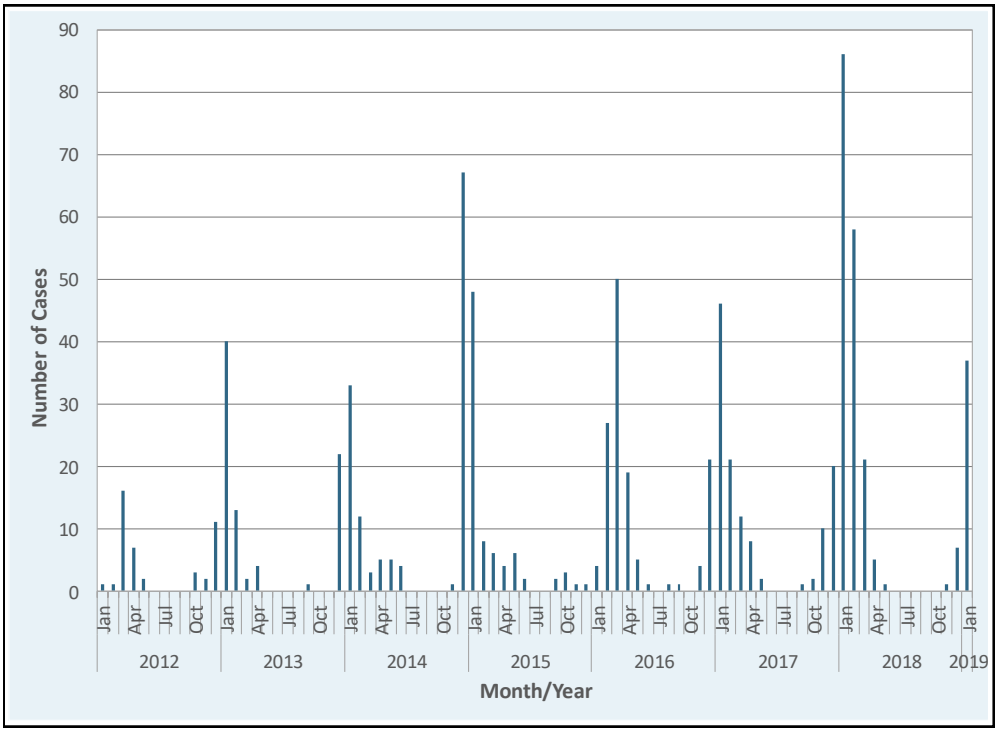
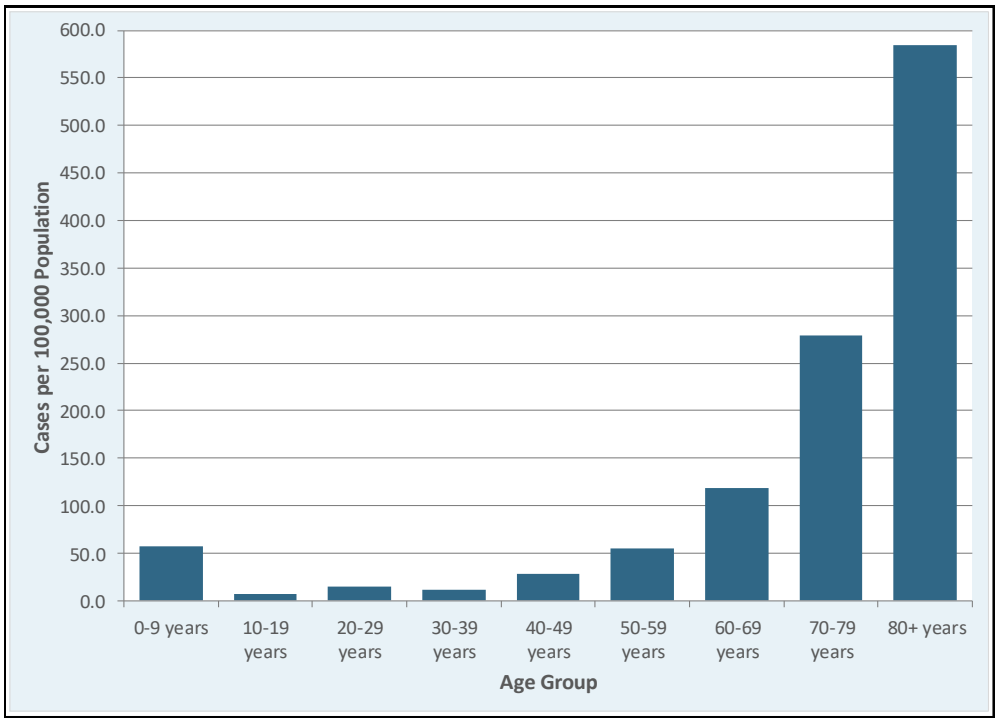


Figure 26. Incidence of Hospitalized Influenza Cases by Age Group, Davis County, 2017-18 Influenza Season



The 2017-18 influenza season (October 2017 - May 2018) was a very severe season in Davis County (see Figure 25). A total of **202** hospitalized-influenza cases were reported during the 2017-18 season, an 80.4% increase compared to the 2016-17 season.

Although influenza cases can occur at any time of the year, influenza viruses thrive during cold weather and cases typically peak in the winter months (January and February). The 2017-18 influenza season was no different with cases peaking in January (see Figure 25). The most common circulating strain was influenza A (H_3).

The very young and very old are the populations most severely affected by influenza infection. These groups had the highest rates of hospitalizations in the 2017-18 influenza season. Nearly 59% of the hospitalized cases were ≥60 years (see Figure 26).

The current influenza season (October 2018 - May 2019) has been less severe, thus far, when compared to the 2017-18 season (see Figure 25). Influenza A (H_1N_1) has been the most common circulating strain in Davis County.

Mumps is a contagious disease caused by a virus and is spread through saliva or mucus from the mouth, nose, or throat. The infection can be spread through any means in which saliva or mucus comes into contact with another individual or an object that an infected individual touches. Examples of potential modes of transmission are coughing, sneezing, talking, sharing items, and touching objects or surfaces with unwashed hands that are then touched by others. The best way to prevent mumps is by getting vaccinated.



Mumps is a contagious disease caused by a virus. It typically starts with fever, headache, and loss of appetite and is followed by swollen salivary glands.

After the mumps vaccination program started in 1967, the United States has seen a 99% decrease in mumps cases. Today, the number of cases ranges from a few hundred to few thousand; however, outbreaks do still occur occasionally (see Figure 27).

In August 2018, a suspected case of mumps was reported in a teacher in Davis School District's Spanish immersion program. Fortunately, no students in the suspected teacher's class had a vaccine exemption for MMR, thus no students needed to be excluded from school. Subsequent lab testing indicated the individual was not infected with mumps.

During 2018, **three** suspect cases of mumps were reported in Davis County. Historically, Davis County has a low rate of mumps when compared to Utah and the United States (see Figure 28).

Because mumps cases have increased in recent years, the Advisory Committee on Immunization Practices (ACIP) now recommends that high-risk groups, who were previously vaccinated with two doses of MMR vaccine, receive a third dose to improve protection during an outbreak situation.

Figure 27. Mumps Cases, United States, 2000-2018

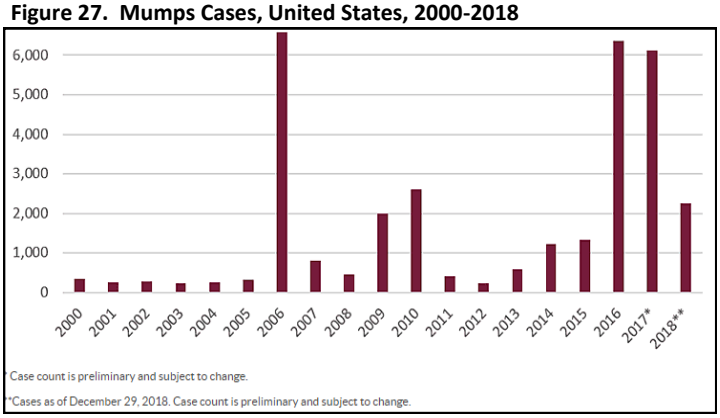
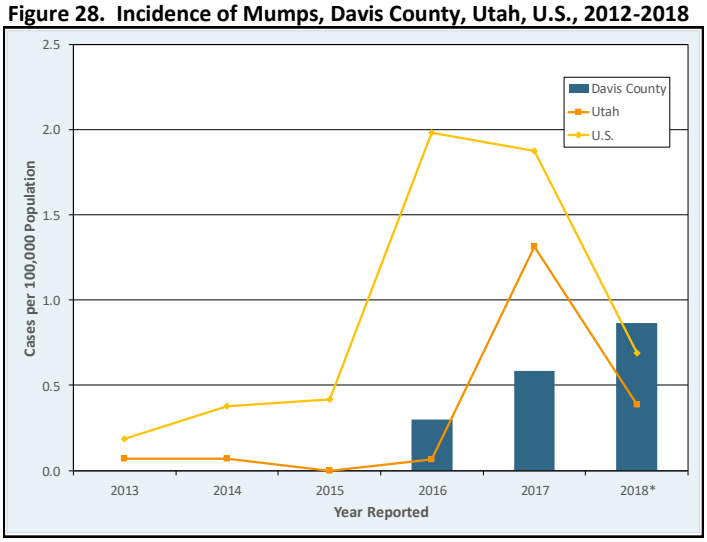


Figure 28. Incidence of Mumps, Davis County, Utah, U.S., 2012-2018



*Utah and United States 2017 data are provisional.

2018 Overview

Three cases of suspect mumps were reported in Davis County during 2018.

A suspected case of mumps was investigated in association with Davis School District.

Historically, Davis County has a low rate of mumps when compared to Utah and the United States.

Pertussis

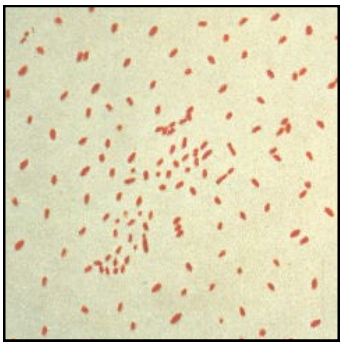
2018 Overview

There were 37 cases of pertussis reported in Davis County during 2018.

Davis County investigates an average of 71 cases each year. Thus, 2018 could be considered a very mild year for pertussis.

No outbreaks of pertussis were investigated during 2018.

Pertussis is a vaccine-preventable disease caused by the bacteria *Bordetella pertussis*. The disease is of particular concern in infants because of higher rates of hospitalization, pneumonia, and death, when compared with older children and adults.



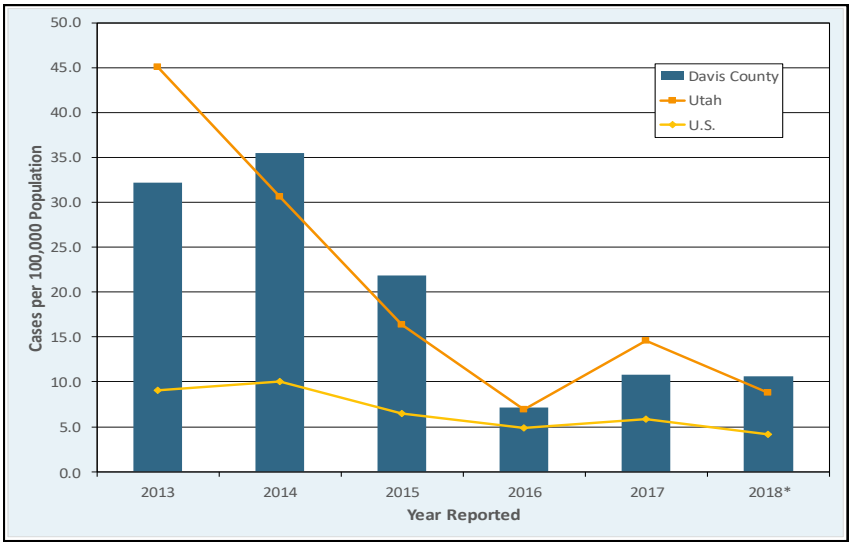
Pertussis is a respiratory illness commonly known as "whooping cough" due to the gasping sound a patient makes when they suck in air after a coughing fit.

All reported pertussis cases are investigated promptly in an effort to stop disease spread. Contacts that experience a prolonged exposure to an infected case may benefit from antibiotic prophylaxis, if administered in a timely manner. Children are routinely vaccinated against pertussis before entry into the school system. Upon entry into junior high, a booster dose of TD/Tdap is required. The Tdap (tetanus, diphtheria, and acellular pertussis) is a one-time vaccine and is recommended for anyone age 11-64 years. Recent guidance from the Centers for Disease Control and Prevention recommends pregnant women receive a Tdap vaccine with every pregnancy, preferably given between weeks 27-36. Tetanus vaccination, however, is recommended every 10 years.

The age groups most often affected by pertussis are those who are under-vaccinated, including infants/children under five years (because they have not yet completed the full vaccination series). Although cases are also common in older children and adults due to waning immunity and vaccine exemptions, illness in these age groups is usually milder and the diagnosis is often delayed or missed.

During 2018, there were **37** cases of pertussis reported in Davis County. This is the same number of cases that was reported in 2017 (see Figure 29). DCHD investigates approximately 71 cases each year (based on a 5-year average), thus 2018 has been a mild year for pertussis.

Figure 29. Incidence of Pertussis, Davis County, Utah, U.S., 2013-2018



*Utah and United States 2018 data are provisional.







Vector-borne / Zoonotic Diseases

A vector-borne or zoonotic disease is one that can be passed between insect or animal to humans.

Figure 30. Cases of Vector-borne/Zoonotic Diseases in Davis County, 2006-2018

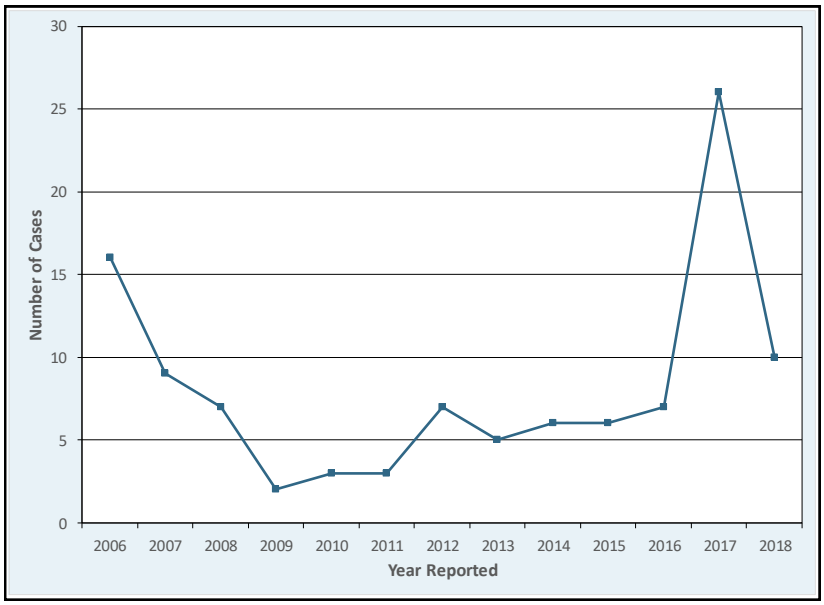
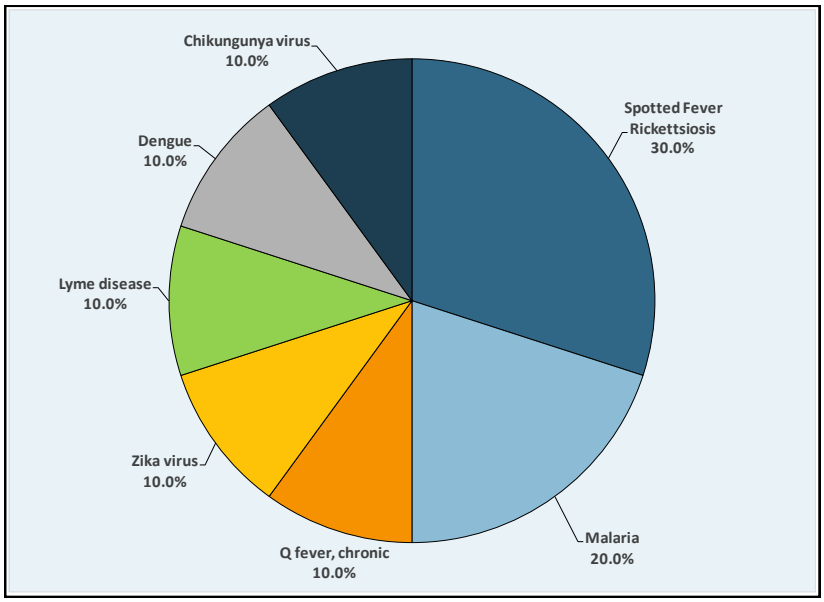


Figure 31. Vector-borne/Zoonotic Diseases, Davis County, 2018



Vector-borne/zoonotic diseases are those diseases transmitted by an animal or insect. Vector-borne/zoonotic diseases do not occur often in Davis County. Typically vector-borne/ zoonotic illnesses are contracted during international or out-of-state travel. Several cases were reported during 2006 when West Nile virus was first active in Utah's mosquito population. However, in recent years, Davis County has remained somewhat consistent in the number of diseases reported, with the exception of 2017 (see Figure 30).

During the summer of 2017, West Nile virus among the mosquito population was elevated, resulting in an increase in human cases. In contrast, very few mosquito pools were positive for West Nile virus in 2018. As a result, the number of vector-borne/zoonotic illnesses in 2018 decreased to a level more comparable to years prior (see Figure 30).

A total of **10** cases of vector-borne/zoonotic disease were reported in Davis County during 2018. Spotted fever rickettsiosis was the most frequently reported vector-borne/zoonotic disease with **three** cases (30.0%), followed by malaria with **two** cases (20.0%), and Q fever, Zika virus, Lyme disease, dengue, and chikungunya each with **one** case (10.0%) (see Figure 31).

Rabies

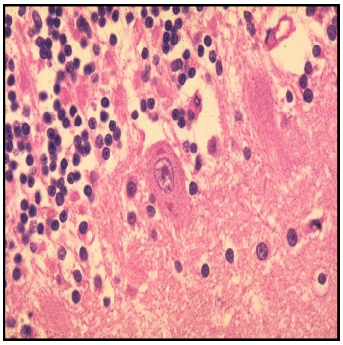
2018 Overview

A total of 332 incidents involving an exposure to an at-risk animal were evaluated in 2018.

During 2018, zero animals tested positive for rabies in Davis County.

In the fall of 2018, Utah saw its first human death from rabies since 1944.

Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. The vast majority of rabies cases reported to the Centers for Disease Control and Prevention each year occur in wild animals such as raccoons, skunks, bats, and foxes. Domestic animals account for less than 10% of reported rabies cases, with cats, cattle, and dogs most often infected. In Utah, the majority of animal cases are reported in bats.



The rabies virus infects the central nervous system, ultimately causing disease in the brain and death.

Rabies-related human deaths are very rare in the United States today. Prophylaxis treatment has proven nearly 100% successful, preventing serious illness and mortality in those who are exposed to an at-risk animal. Most human fatalities associated with rabies occur in people who fail to seek medical assistance, usually because they were unaware of their exposure.

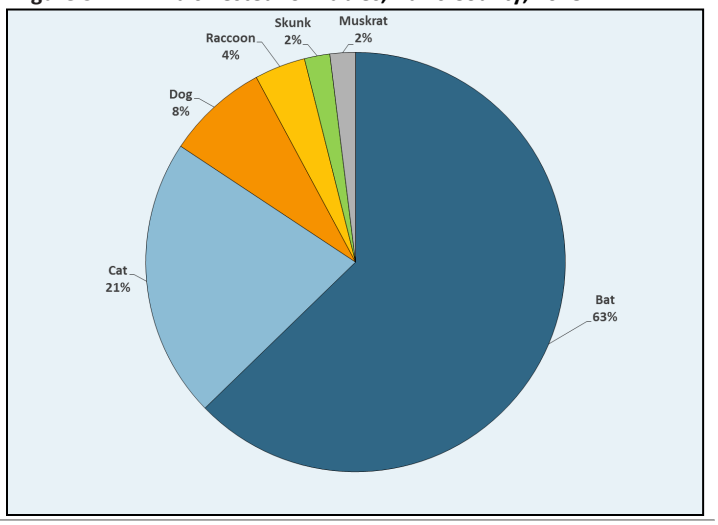
During 2018, DCHD evaluated **332** incidents where an exposure to an at-risk animal was reported. These involved 225 dogs, 54 cats, 37 bats, seven raccoons, two foxes, two monkeys, two skunks, one muskrat, one human, and one unknown. Each case was evaluated for need of rabies post-exposure prophylaxis (PEP). Those who were recommended PEP were monitored through completion of therapy or until PEP discontinued (either by choice or due to negative test results of the suspect animal). Of the 45 individuals that were recommended PEP, 10 started treatment and 35 declined.

The number of incidents evaluated in 2018 decreased notably from what was evaluated in 2017. This is mostly due to a change in protocol. Beginning in 2018, DCHD only evaluated those incidents where the animal was unavailable for quarantine or testing.

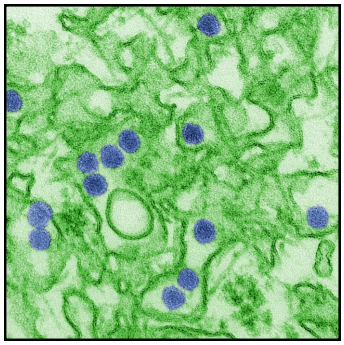
In the fall of 2018, a Utah resident was confirmed with and died from rabies. This was the first human death from rabies in Utah since 1944. The individual had been exposed to bats that had roosted in their home. Several family members and healthcare workers had potential exposure to the case and were recommended to receive PEP. DCHD followed-up with family members and ensured PEP was completed.

In 2018, Davis County Environmental Health Division submitted 54 animals for rabies testing (see Figure 32). None of these tested positive for rabies.

Figure 32. Animals Tested for Rabies, Davis County, 2018



Zika virus is a virus that can cause fever, rash, joint pain, and conjunctivitis. It is spread mainly through the bite of an infected *Aedes aegypti* or *Aedes albopictus* mosquito. Zika virus can also be transmitted through sex with an infected person. There is currently no medicine or vaccine for Zika virus infection so the best way to prevent infection is by preventing mosquito bites. Using EPA-registered insect repellent, wearing long-sleeved shirts and pants, and limiting exposure to areas with standing water are all effective methods of mosquito bite prevention.



Zika virus is spread mostly by the bite of an infected *Aedes* mosquito, but can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause birth defects. Sexual transmission of Zika virus is also possible.

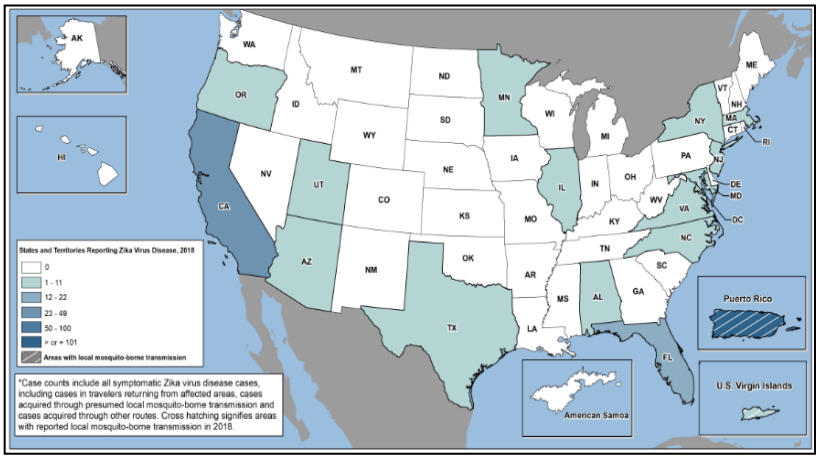
Additionally, Zika virus may be transmitted through sexual contact and can be passed from mother to fetus during pregnancy. Fetuses infected with Zika virus can experience birth defects associated with the brain, such as microcephaly. Other potential fetal complications include defects of the eye, hearing deficits, and impaired growth. Pregnant woman should refrain from travelling to areas where Zika virus is actively being transmitted. The Centers for Disease Control and Prevention continues to update and distribute travel notices for these areas. Transmission of Zika virus has also been reported in the United States in both Florida and Texas.

In 2018, Davis County Health Department had **one** confirmed case of Zika virus. This individual was pregnant and was originally from an area known to have active transmission of Zika virus. She returned to her country of origin before delivering, therefore DCHD will be unable to follow her or her baby.

During 2018, 64 cases of Zika virus have been reported in the United States. Of these, all were in travelers returning from affected areas. (see Figure 33). This is a significant decrease when compared to 2017, when 452 cases were reported.

Utah's local health departments continue to oversee and follow Zika virus investigations with help from the Utah Department of Health. As pregnant females deliver, additional follow-up of the mother and her baby are coordinated through the Utah Birth Defect Network.

Figure 33. Zika Virus Cases Reported in the U.S., 2018

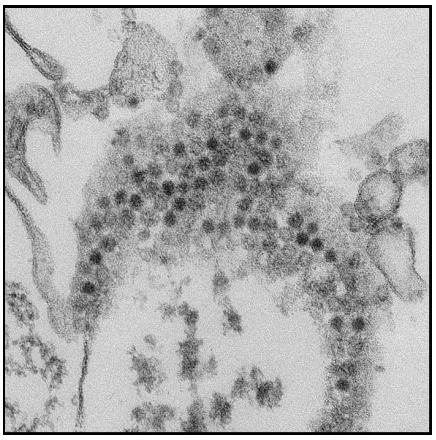


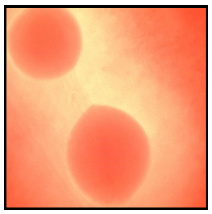
2018 Overview

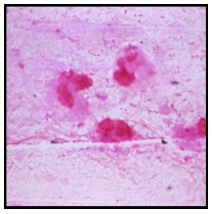
In 2018, one confirmed case of Zika virus was reported in Davis County.

The Davis County case was pregnant and her country of origin is known to have active transmission of Zika virus.

Between 2017 and 2018, a significant decrease of Zika virus cases was identified in the United States.





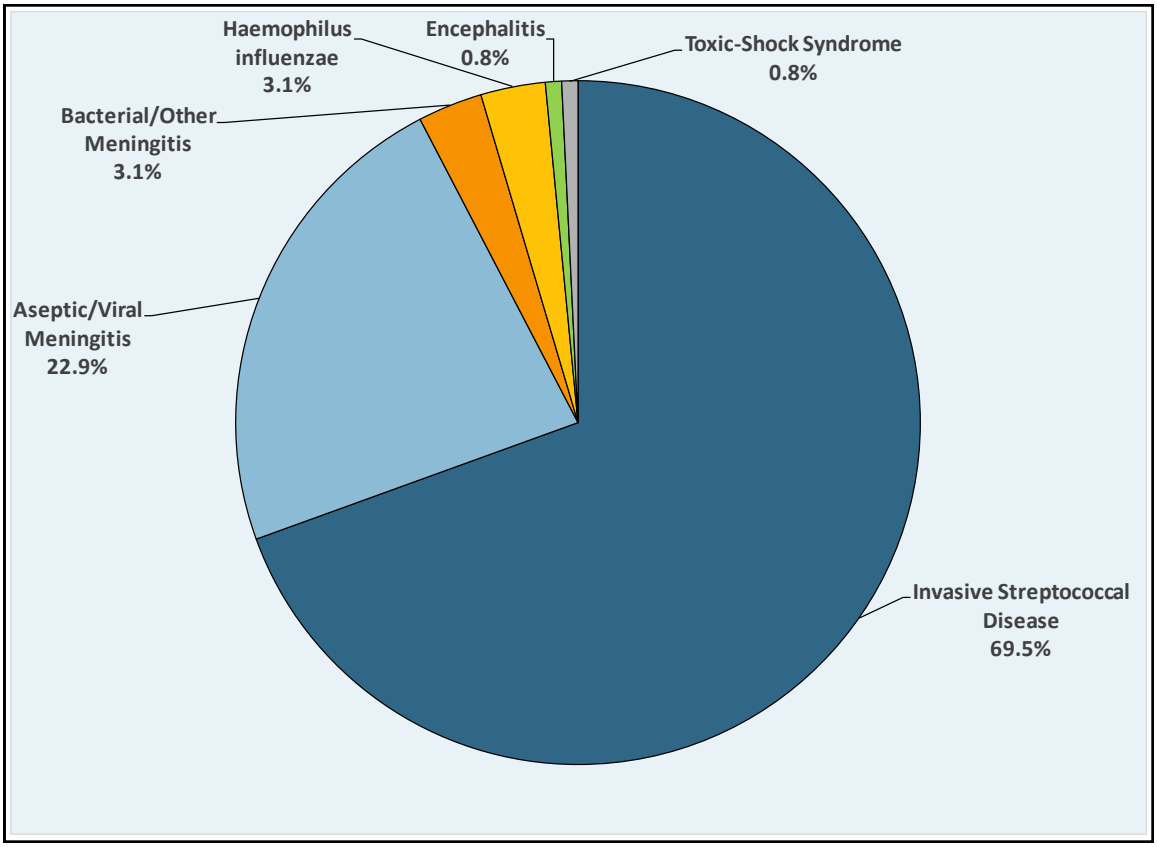


Invasive Diseases

An invasive disease includes infections of the bloodstream, as well as meningitis and encephalitis.

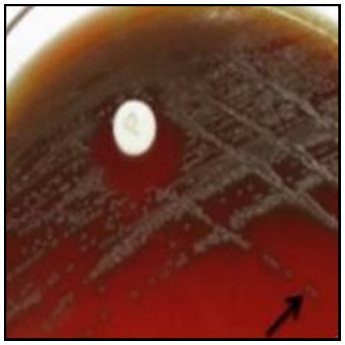
Invasive diseases include infections of the bloodstream as well as meningitis and encephalitis. All cases of meningitis, encephalitis, and toxic-shock syndrome are reportable to the health department, regardless of the causative organism. In addition, all cases of invasive streptococcal disease (isolation of *Streptococcus* from a normally sterile site) must be reported. The most common invasive diseases reported in Davis County in 2018 were invasive streptococcal infections with **91** (69.5%) cases. These included Group A *Streptococcus*, Group B *Streptococcus,* Group C & G *Streptococcus*, *Streptococcus pneumoniae*, and other streptococcal infections. Aseptic/viral meningitis was the second most common disease in this category with **30** (22.9%) cases, followed by bacterial/other meningitis and *Haemophilus influenzae* each with **four** (3.1%) cases, and encephalitis and toxic-shock syndrome each with **one** (0.8%) case (see Figure 34).

Figure 34. Invasive Diseases, Davis County, 2018



Invasive Streptococcal Infections

The primary invasive streptococcal diseases of public health concern are Group A, Group B, and *Streptococcus pneumoniae*.



Most strep infections are relatively mild illnesses such as strep throat, scarlet fever, and impetigo. Occasionally these bacteria can cause severe and life-threatening diseases.

- **Group A** streptococcal invasive disease manifests as necrotizing fasciitis, streptococcal toxic-shock syndrome, bacteremia, and pneumonia. It is transmitted person-to-person by contact with infectious secretions. Asymptomatic pharyngeal carriage occurs among all age groups, but is most common among children.
- **Group B** streptococcal invasive disease (GBS) in neonates manifests as sepsis, pneumonia, and meningitis. Infection in the first week of life is called early-onset GBS. In adults, sepsis and soft tissue infections are most common. Pregnancy-related infections include sepsis and amnionitis. Asymptomatic carriage in gastrointestinal and genital tracts is common and intrapartum transmission via ascending spread from vaginal and/or gastrointestinal GBS colonization occurs. Mode of transmission of disease in non-pregnant adults and older infants (>1 week) is unknown.
- **Group C** *streptococcus* is typically a zoonotic illness and the organisms can be found as pathogens in domestic animals such as horses, cows, birds, rabbits, and guinea pigs. Laboratories may misidentify them as Group A *streptococcus*. They can also be found as part of normal human flora. Many people with Group C infections have underlying health problems, but more recent studies have implicated this disease as an emerging human pathogen.
- **Group G** *streptococcus* is a normal human flora and individuals infected with this organism usually have underlying health problems, especially cancer.
- ***Streptococcus pneumoniae*** invasive disease manifests as pneumonia, bacteremia, meningitis, and sinus/ear infections. More than 90 types of pneumococcal bacteria exist, but not all are considered to be invasive. Of the strains causing invasive disease, 88% are serotypes included in the 23-valent polysaccharide vaccine (PPSV23). Before the first pneumococcal conjugate vaccine (PCV7) was introduced in 2000, the seven serotypes which it prevents were responsible for over 80% of severe pneumococcal infections among children. Now, the PCV13 vaccine includes the original seven serotypes in PCV7, plus six additional serotypes. The best way to prevent pneumococcal disease is by getting vaccinated.

2018 Overview

In 2018, there were 91 cases of invasive streptococcal infections reported in Davis County.

The majority of cases were due to Group B *Streptococcus* and were investigated.

Utah has an elevated rate of early-onset GBS when compared to the United States.

Figure 35. Invasive Streptococcal Infections by Month, Davis County, 2018

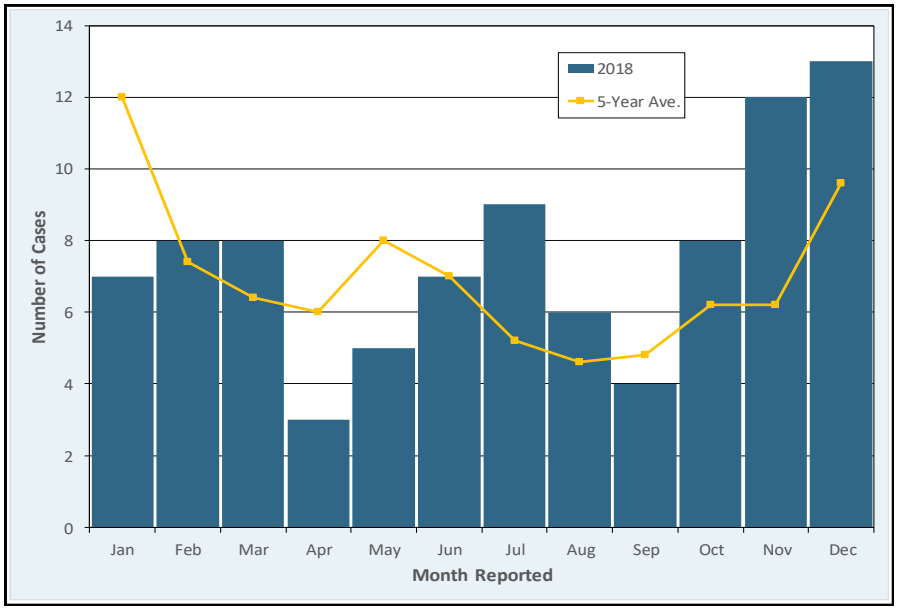
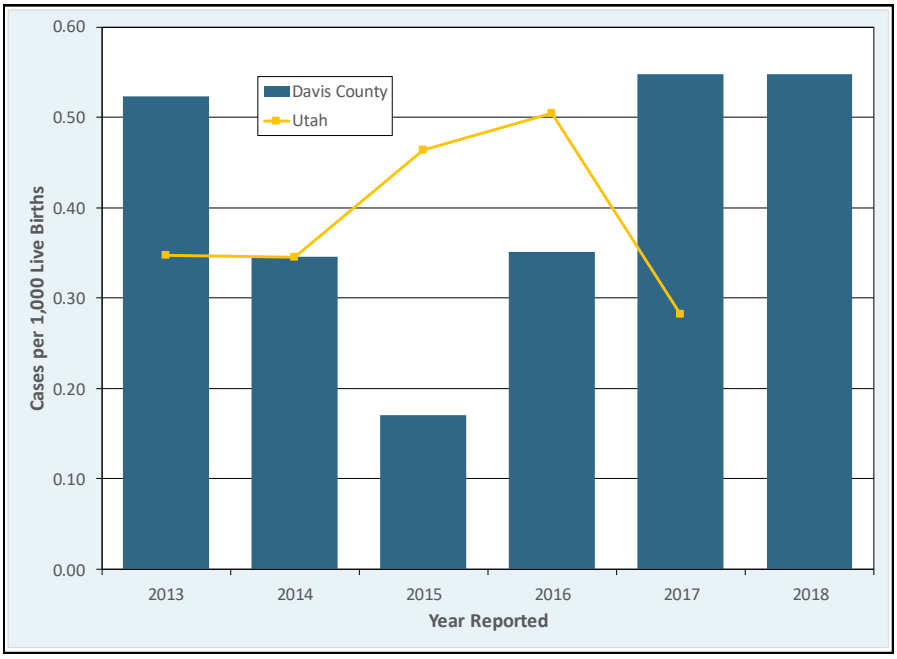


Table 5. Types of Invasive Streptococcus Infections, Davis County, 2018

Type	Number of Cases
Group A *Streptococcus*	11
Group B *Streptococcus*	30
Group C and Group G *Streptococcus*	11
Other *Streptococcus* (*mitis*, *viridans*, etc.)	17
Streptococcus pneumoniae	22
Total	**91**

Figure 36. Incidence of Early-Onset Group B *Streptococcus*, Davis County, Utah, 2013-2018



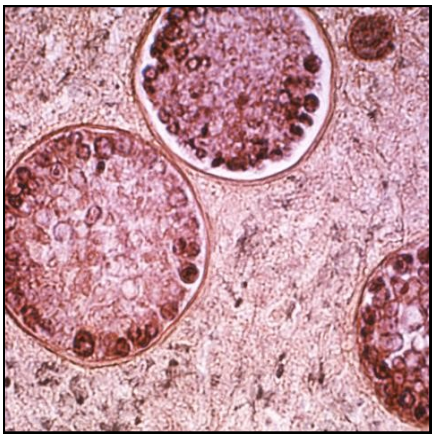
In 2018, **91** cases of invasive streptococcal infections were reported (see Figure 35). The majority of cases were due to Group B *Streptococcus* and required investigation (see Table 5).

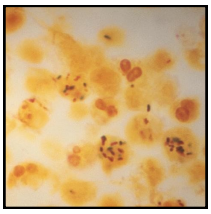
Invasive streptococcal infections tend to cause severe illness. In 2010, over 12% of reported invasive streptococcal infections in Davis County were fatal. Since then, the fatality rate among streptococcal infections has declined. In 2018, seven out of 97 cases were fatal - a case fatality rate of 7.7%. This represents a slight increase from the 6.0% reported in 2017.

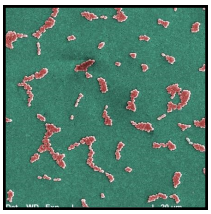
Group B *streptococcus* is a leading cause of morbidity and mortality among infants. Early-onset GBS is the focus of an ongoing investigation by the Utah Department of Health. This investigation aims to determine a cause of elevated incidence rates of early-onset GBS in Utah infants.

The investigation focuses on confirmed cases (n=70) from January 2015 through July 2018. During this time period, the incidence of early-onset GBS in Utah was 0.40 cases per 1,000 live births, compared to the national incidence of 0.22 cases per 1,000 live births. Davis County has also experienced elevated rates when compared to Utah and the U.S. (see Figure 36).

CDC guidelines for GBS in pregnant women should be closely followed regarding screening and treatment in order to reduce the impact of this disease.







Other Diseases

Diseases that do not fall under a specific identified category.

Diseases that do not fall under a specific identified category will be discussed in this section.

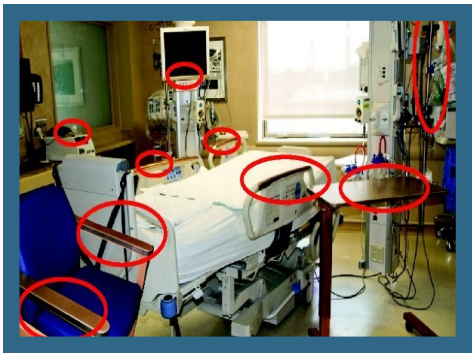
Hepatitis C infections made up the majority of this category, followed by carbapenem-resistant Enterobacteriaceae, coccidioidomycosis, legionellosis, leptospirosis, and Creutzfeldt-Jakob disease (see Table 6).

Table 6. Other Reportable Disease/Conditions, Davis County, 2018

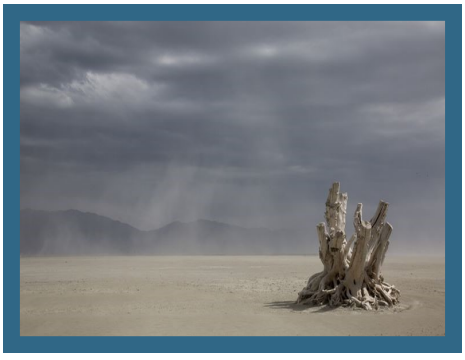
Disease	Number of Cases
Hepatitis C, acute and chronic	118
Carbapenem-Resistant Enterobacteriaceae (*Acinetobacter*, *Klebsiella*, *E. coli, Enterobacter)*	12
Coccidioidomycosis	3
Legionellosis	3
Leptospirosis	1
Creutzfeldt-Jakob Disease (CJD)	1
Total	**138**



Hepatitis C



Carbapenem–Resistant Enterobacteriaceae (CRE)



Coccidioidomycosis

Carbapenem-Resistant Enterobacteriaceae

2018 Overview

A total of 12 CREs were reported in Davis County in 2018.

This includes eight *Acinetobacter* cases, three *Enterobacter* cases, and one *Klebsiella* case.

Public health continues to learn more about these organisms, including where they are occurring and how to prevent their spread.

The public health problem of antibiotic resistance is not new. However, due to the overuse of antibiotics in humans and animals, the problem is increasing in magnitude and new multidrug-resistant organisms (MDROs) are emerging. Carbapenem-resistant Enterobacteriaceae (CRE) are particularly concerning. Some CRE infections have developed resistance to most available antibiotics. CRE infections are very difficult to treat, can spread quickly, and may contribute to death in 40% of patients who become infected. Although these organisms are rare, they are increasingly identified in healthcare facilities throughout the United States.



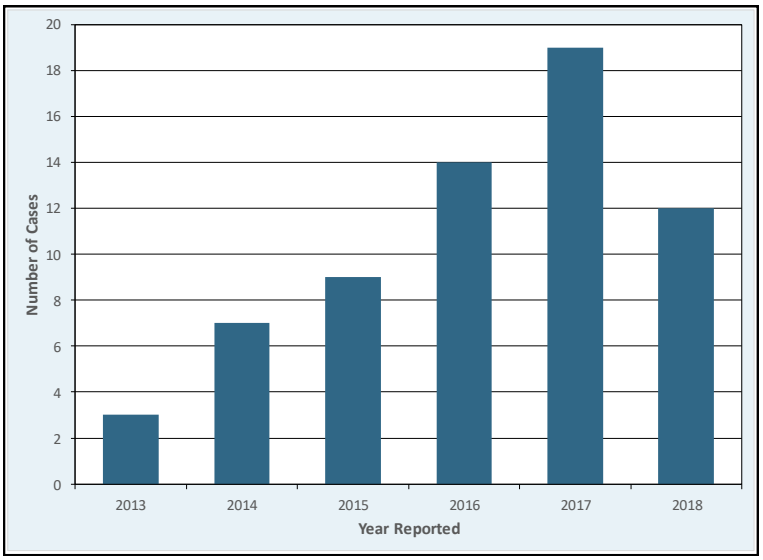
Klebsiella is a type of Gram-negative bacteria that can cause different types of healthcare-associated infections, including pneumonia, blood infections, wound or surgical site infections, and meningitis.

Utah laboratories and healthcare facilities are required to report the following CREs to the state or local health department:

- *Acinetobacter* species with resistance or intermediate resistance to carbapenem (meropenem and imipenem) from any site.
- *Enterobacter* species with resistance or intermediate resistance to carbapenem (meropenem and imipenem) from any site.
- *Escherichia coli* with resistance or intermediate resistance to carbapenem (meropenem, ertapenem, and imipenem) from any site.
- *Klebsiella* species with resistance or intermediate resistance to carbapenem (meropenem, ertapenem, and imipenem) from any site.
- *Pseudomonas aeruginosa* with resistance or intermediate resistance to carbapenem (meropenem, ertapenem, and imipenem) from any site. This is only electronically reported and is not investigated at the local level.

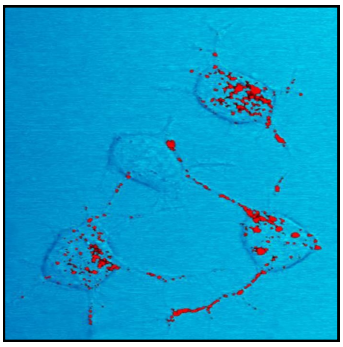
A total of **12** CREs (including **eight** *Acinetobacter* cases, **three** *Enterobacter* cases, and **one** *Klebsiella* case) were reported to Davis County Health Department (DCHD) during 2018 (see Figure 37). This represents a 36.8% decrease from the 19 cases reported in 2017.

Figure 37. CRE Infections, Davis County, 2013-2018



Creutzfeldt-Jakob Disease

Prion diseases or transmissible spongiform encephalopathies (TSEs) are a family of rare progressive neurodegenerative disorders that affect both humans and animals. They are distinguished by long incubation periods, characteristic spongiform changes in the brain associated with neuronal loss and failure to induce inflammatory response.



Classic Creutzfeldt-Jakob Disease is a rare, fatal, degenerative brain disease caused by abnormal, transmissible proteins called prions.

The causative agent of TSEs is believed to be a prion. A prion is an abnormal, transmissible agent that is able to induce abnormal folding of normal cellular prion proteins in the brain, leading to brain damage and the characteristic signs and symptoms of the disease. Prion diseases usually progress rapidly and are always fatal.

Classic Creutzfeldt-Jakob Disease (CJD) is a human prion disease. It is a neurodegenerative disorder with characteristic clinical and diagnostic features. Infection with this disease leads to death usually within one year of onset of illness. It has been recognized since the early 1920s. The most common form of classic CJD is believed to occur sporadically, caused by the spontaneous transformation of normal prion proteins into abnormal prions. This sporadic disease occurs worldwide, including the United States, at a rate of roughly 1 to 2 cases per 1 million population per year. The risk of CJD increases with age. In persons over 50 years of age, the annual rate is approximately 3.4 cases per million. Where the majority of CJD cases occur as sporadic disease, a smaller proportion of patients (5-15%) develop CJD because of inherited mutations of the prion protein gene.

Appropriate post-mortem care is critical with any suspect case of CJD. A system is in place to assist family members in obtaining appropriate testing, which includes an autopsy that is required to confirm the diagnosis of CJD. These services are provided free of charge. Specimens collected during the autopsy are submitted to the National Prion Disease Pathology Surveillance Center for disease confirmation. These cases are examined individually to aid in the timely detection of new or atypical cases and establish more accurate classifications of prion diseases.

Davis County investigated **one** case of sporadic CJD in 2018. This patient was experiencing dementia and rapid deterioration, which the physician was concerned may be due to CJD. The patient refused a spinal tap or to participate in any further testing to determine the source of symptoms. Without laboratory tests to confer, the patient's symptoms could not be ruled out and the case was classified as suspect.

2018 Overview

DCHD investigated one suspect case of CJD during 2018.

Laboratory tests were not available to confirm the diagnosis.

On average, only one in a million people each year will get this disease.

Hepatitis C

2018 Overview

In 2018, 118 cases of HCV were reported in Davis County.

This represents a 8.5% decrease from what was reported in 2017.

Free confirmatory testing was performed on four Davis County residents through grant funding.

Hepatitis C is a disease caused by a virus that infects the liver. Over time it can cause liver damage including cirrhosis, liver failure, and cancer. Approximately 15-25% of those infected with hepatitis C virus (HCV) will recover from the infection. The remaining 75-85% develop chronic infection. Each year approximately 15,000 people die from the complications of liver disease caused by hepatitis C.



Hepatitis C is a bloodborne virus. Today, most people become infected with HCV by sharing needles or other equipment to inject drugs.

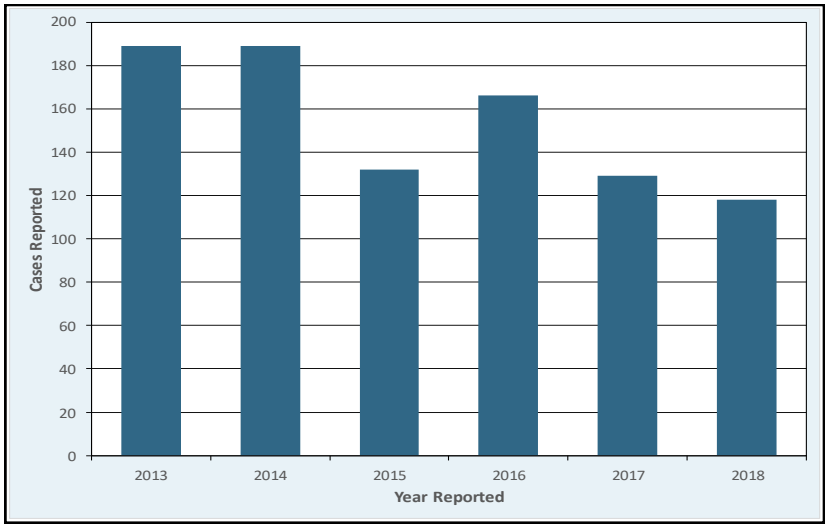
Most of those who develop chronic HCV infection remain asymptomatic for many years. Some experience a range of symptoms including fatigue, headache, joint aches, muscle aches, nausea, jaundice, loss of appetite, and abdominal pain.

HCV is a bloodborne pathogen that is predominantly spread by exposure to contaminated blood or blood products. Currently, the most prevalent mode of transmission is sharing needles or syringes to inject drugs. Sexual transmission of HCV can occur, but does not appear to be a common mode of transmission. HCV is not spread through casual contact, kissing, sneezing, hugging, sharing glasses/utensils, or from breast milk.

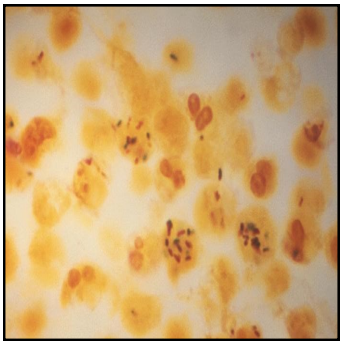
Hepatitis C is typically reported as a positive screening test for HCV antibodies. Investigation of this disease is focused on determining whether the case is acute, chronic, or has a false-positive test. To do so, confirmatory testing is necessary. Many reports of hepatitis C come from blood donation/plasma centers, which have limited contact information for the person donating, making investigation of the disease difficult. Of those investigated, the most prevalent risk factor identified was injecting drugs, currently or in the past. Most infected individuals were unaware of their infection.

In 2018, **118** cases of HCV were reported in Davis County, an 8.5% decrease from the 129 cases reported in 2017 (see Figure 38). During 2018, DCHD implemented a grant to help identify acute cases of hepatitis B & C. The grant provides free confirmatory testing for hepatitis B & C patients (and their partners) who report using intravenous drugs. During 2018, four Davis County residents received testing through this grant.

Figure 38. Hepatitis C Virus Infections, Davis County, 2013-2018



Legionella bacteria can cause Legionnaires' disease or Pontiac fever, collectively known as legionellosis. The disease is transmitted through the air from a soil or water source. All studies to date have shown that the organism cannot be spread from person-to-person. Outbreaks occur when individuals are exposed to a common source of *Legionella pneumophila* bacteria in the environment.



Legionellosis is a bacterial infection that may cause mild respiratory illness or pneumonia. It is associated with two distinct illnesses: Legionnaires' disease and Pontiac fever.

An estimated 8,000-18,000 people need care in a hospital due to Legionnaire's disease each year in the United States. However, many infections are not diagnosed or reported, so this number may be higher. Most legionellosis cases are sporadic; 23% are nosocomial (hospital acquired) and 10-20% can be linked to outbreaks.

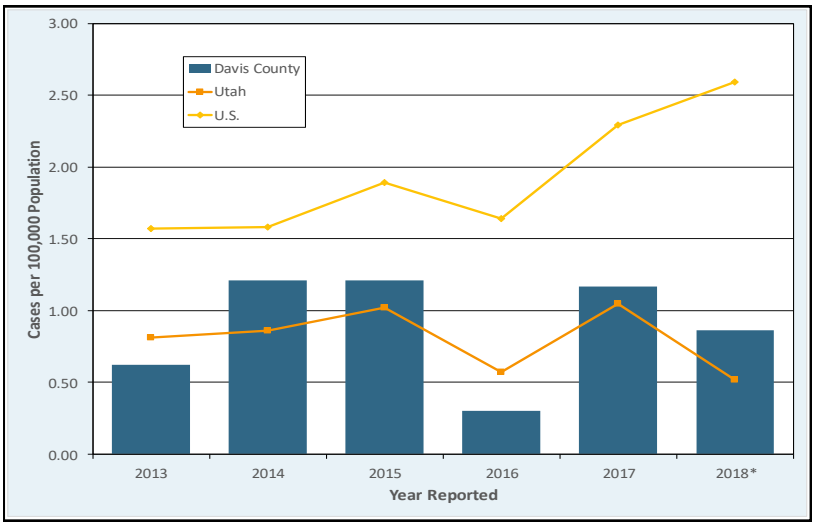
It is important for public health to identify the source of the infection before an outbreak occurs. Often, the source remains unknown. Aerosolizing of water, such as showers, CPAP machines, humidifiers, swamp coolers, and spas, provide a good mechanism for transmission. Healthy individuals, when exposed, typically do not develop the disease. However, those who are immunocompromised are at higher risk.

During 2018, there were **three** cases of legionellosis reported in Davis County. Most of the cases had pre-existing medical conditions that rendered them to be more susceptible to this infection. Fortunately, all of the cases recovered.

Although *Legionella* is not spread from person-to-person, it is important for public health to identify the source of the infection before an outbreak occurs. In 2018, Davis County Health Department (DCHD) received funding to process and test water samples for *Legionella*. DCHD has not currently had need to use these funds, but will have them available moving forward into 2019.

Both Davis County and Utah typically have lower rates of legionellosis when compared to the United States (see Figure 39).

Figure 39. Legionellosis Cases, Davis County, Utah, U.S., 2013-2018



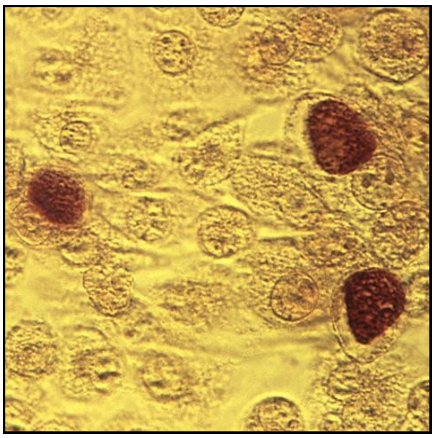
*Utah and United States 2018 data are provisional.

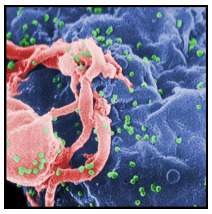
2018 Overview

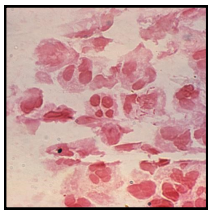
A total of three cases of legionellosis were reported in Davis County during 2018.

Individuals with a weakened immune system are at a greater risk of contracting legionellosis.

Both Davis County and Utah typically have lower rates of legionellosis when compared to the United States.







Sexually Transmitted Diseases

Diseases that are caused by bacteria, viruses, and other organisms transmitted from one person to another through sexual activity.

Sexually transmitted diseases (STDs) are caused by bacteria, viruses, and other organisms transmitted from one person to another through sexual activity. Bacterial STDs such as chlamydia, gonorrhea, and syphilis are curable - using appropriate antibiotic therapy. However, permanent damage may occur (e.g. pelvic inflammatory disease, sterility, organ damage, meningitis) especially if treatment is delayed. Viral STDs such as herpes simplex virus (HSV) and human immunodeficiency virus (HIV) are not curable, but treatment can slow disease progression by reducing viral load (contagiousness) and improving quality of life. Complications from STDs range from mild/moderate illness to infertility, chronic pain, cancer, and even death. Less invasive testing techniques (e.g. urine testing, self-collected oral/rectal testing) have made chlamydia and gonorrhea testing more practical and convenient.

According to a report released by CDC during 2018, STD rates are at an all-time high and continue to increase. In the United States, between 2013 and 2017, chlamydia cases increased by 22%, gonorrhea by 67%, and syphilis by 76%. Despite treatment and continued risk reduction education efforts, Davis County has seen many of the same trends. In Davis County, between 2013 and 2017, chlamydia cases increased by 29%, gonorrhea by 185%, and syphilis by 15%.

Sexually transmitted diseases reported in Davis County during 2018 included chlamydia, gonorrhea, syphilis, and HIV/acquired immunodeficiency syndrome (AIDS). Chlamydia was the most commonly reported STD with **1,158** (81.0%) cases, followed by gonorrhea with **223** (15.6%) cases, syphilis with **36** (2.5%) cases, and HIV/AIDS with **12** (0.8%) cases (see Figure 40).

Figure 40. Sexually Transmitted Diseases, Davis County, 2018

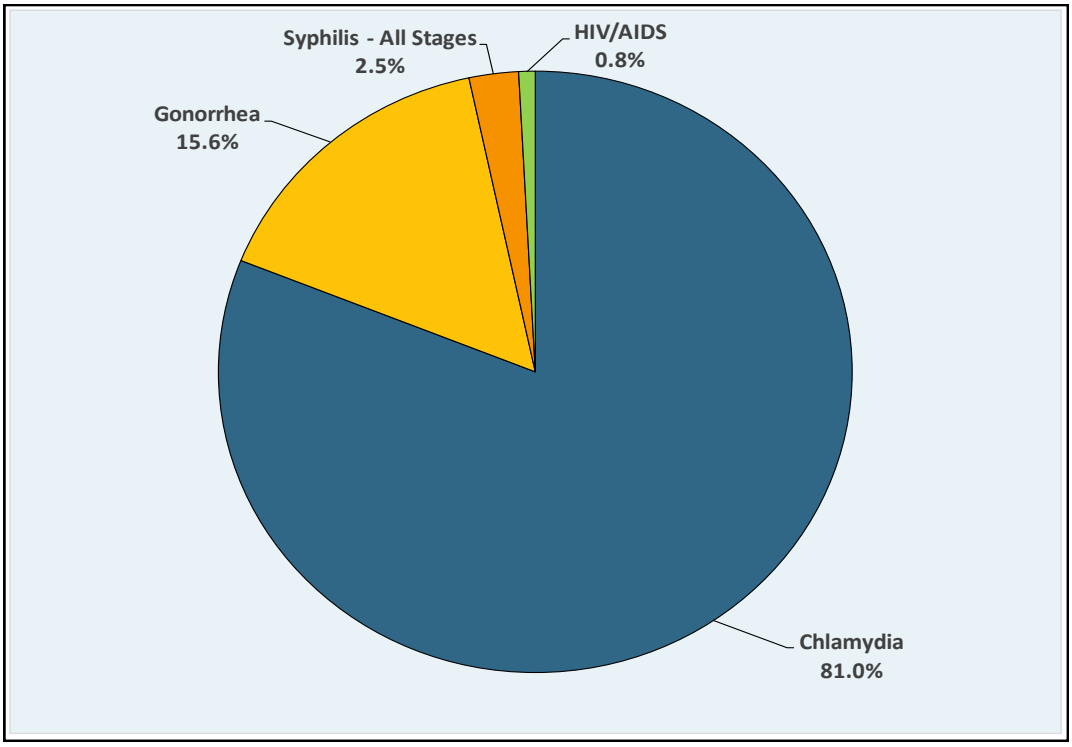
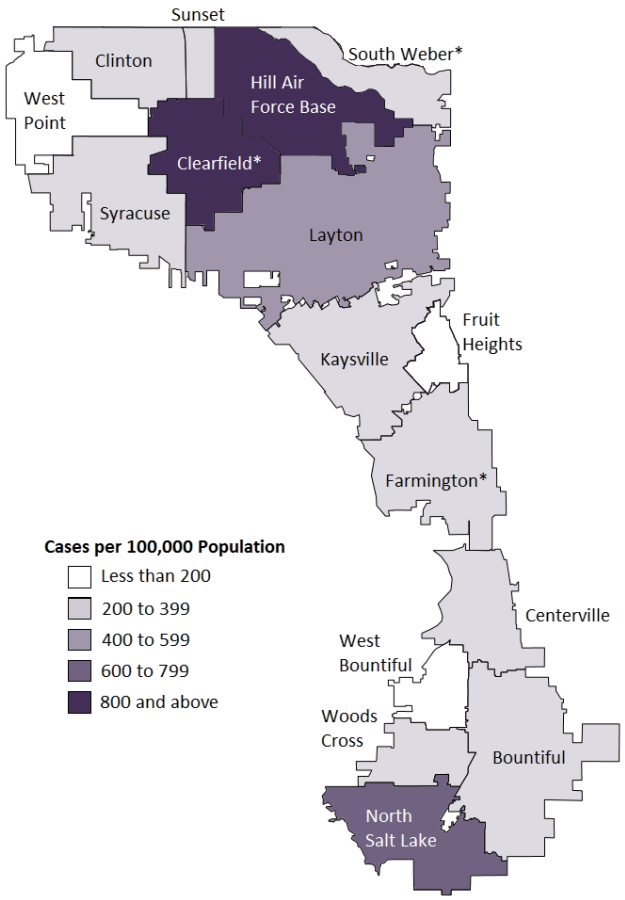


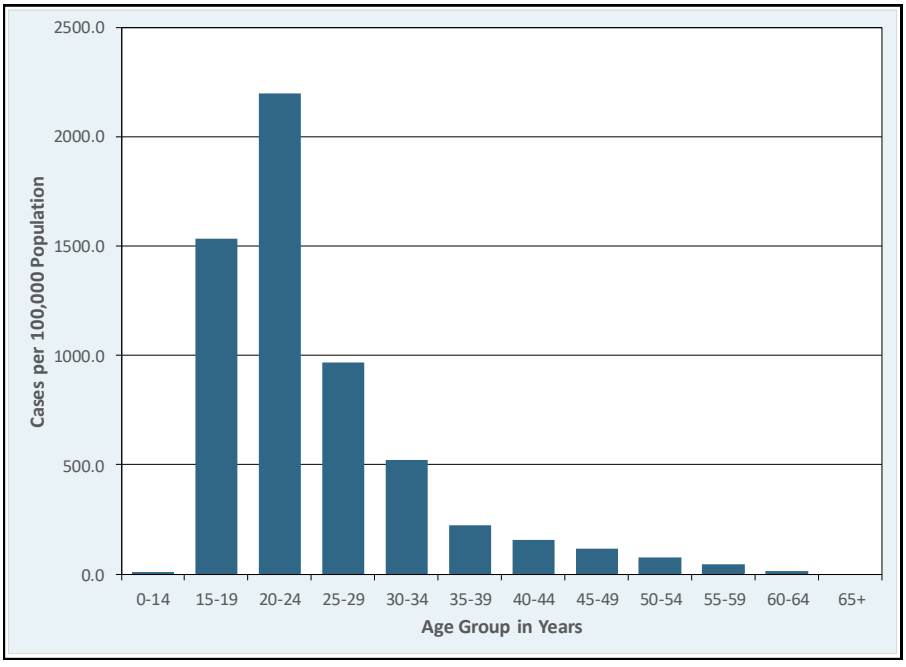
Figure 41. Incidence of all STDs by City, Davis County, 2018



*These cities are impacted by temporary residential establishments (i.e. federal Job Corps Centers and correctional facilities.

Sexually transmitted diseases occurred among residents of every city in Davis County. The incidence rate for STDs in Davis County through 2018 was 410.8 cases per 100,000 residents. The city rates were adjusted by age to account for the higher incidence of STD infection in cities with a larger young adult population. Hill Air Force Base and Clearfield had the highest rate of STDs, while Fruit Heights, West Bountiful, and West Point had the lowest rates (see Figure 41).

Figure 42. Incidence of all STDs by Age Group, Davis County, 2018



Sexually transmitted diseases were most often reported among women (59.9%) and among 20-24 years old (see Figure 42). Overall, STD incidence was high from 15 years of age to 34 years of age.

Chlamydia

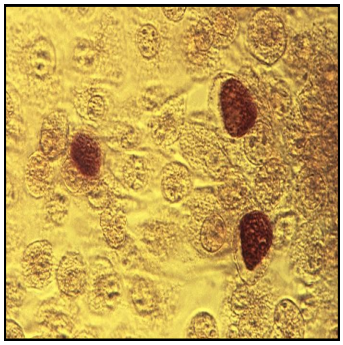
2018 Overview

A total of 1,158 chlamydia cases were reported in Davis County during 2018.

Chlamydial infections continue to account for the largest disease burden in Davis County.

Traditionally, Davis County has lower rates of chlamydia when compared with Utah and the United States.

Chlamydia is a sexually transmitted disease caused by the bacteria *Chlamydia trachomatis*. Chlamydia is the most common reported sexually transmitted disease in the United States (see Figure 43). Most females and approximately 50% of males infected with chlamydia do not have obvious symptoms. Serious complications include infertility, ectopic pregnancies, epididymitis, arthritis, and prostatitis.



Chlamydia is the most commonly reported STD in the United States.

Chlamydia and gonorrhea rates have been increasing for the past several years (see Figure 44). This is partially due to increased screening of high-risk individuals. During 2018, there were **1,158** cases of chlamydia reported in Davis County, a 5.9% increase from the 1,094 cases reported in 2017.

Chlamydial infections continue to account for the largest disease burden in Davis County. However, Davis County traditionally has lower rates of chlamydia when compared to Utah and the United States (see Figure 44).

Most concerning is the age group most commonly affected is 15-24 year olds (see Figure 45). Through case investigations a number of high-risk behaviors were identified, including early initiation of sexual activity, multiple sex partners, unprotected sex, anonymous partners, using drugs or alcohol while engaging in sexual activities, group sex, and anal intercourse.

Figure 43. Incidence of Chlamydia by State, United States, 2017

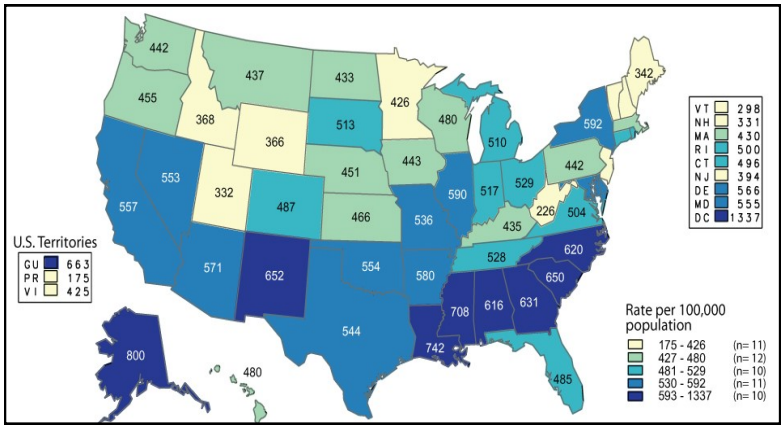
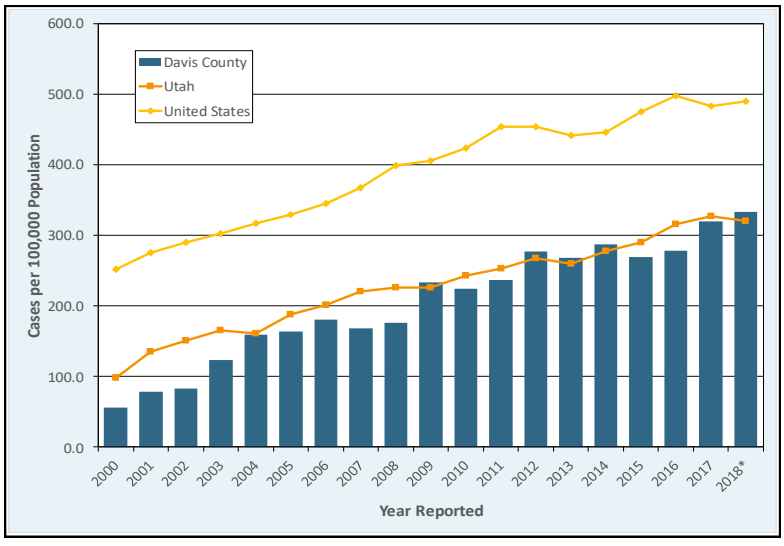


Figure 44. Incidence of Chlamydia, Davis County, Utah, U.S., 2000-2018



*Utah and United States 2018 data is provisional.

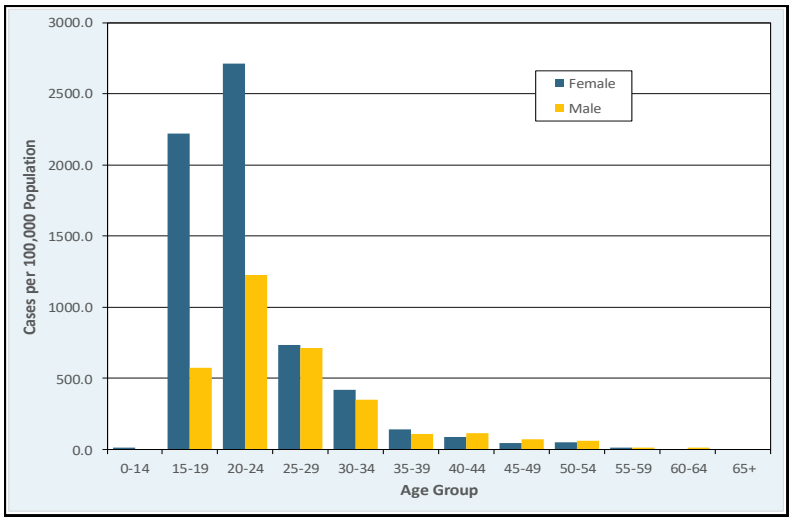
Chlamydia is more prevalent in females versus males (see Figure 46). Women are more susceptible to infection and the female reproductive system is an excellent environment for bacteria to grow. It also makes it more difficult to determine if signs or symptoms from an infection are present. Women are less likely to have symptoms of chlamydia when compared to men. If symptoms do occur, they may go away, yet the infection can remain.

Females are often diagnosed during routine medical visits. Males are typically diagnosed following contact investigations or if they become symptomatic. It is the goal of the health department to locate partners, offer free testing and treatment, provide disease education, and assist in the development of a risk-reduction plan. Contact investigations not only limit the spread of infection to other individuals, but they also decrease the likelihood of re-infection. Re-infections can occur when appropriately treated individuals engage in sexual activity with their untreated partners or resume sexual activity before the infection is cleared.

Effective January 1, 2019, Utah's public health procedures no longer require local health departments to attempt to investigate all cases of chlamydia. Instead, health departments will individually determine local chlamydia case investigation procedures. Chlamydia remains as a reportable infection and healthcare providers and laboratories are still required to report cases within three working days from the time of identification.

Due to this change, it will be important for public health to encourage medical providers to routinely test, treat, and counsel sexually-active patients. DCHD continues to notify the medical community of updates from the *Sexually Transmitted Diseases Guidelines, 2015*. A statewide letter has been distributed to the medical community in an effort to communicate this new change.

Figure 45. Incidence of Chlamydia by Age and Gender, Davis County, 2018



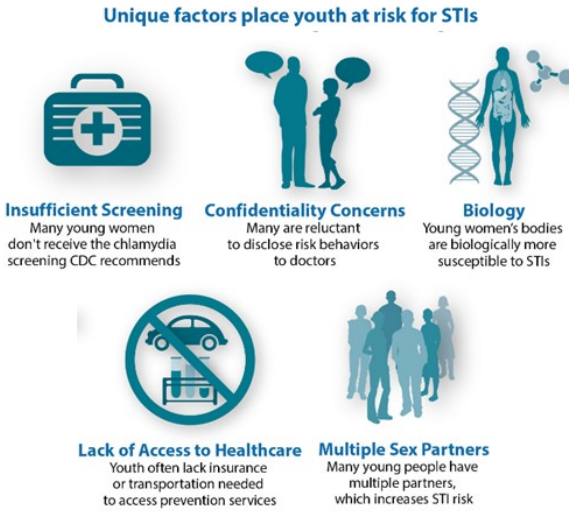
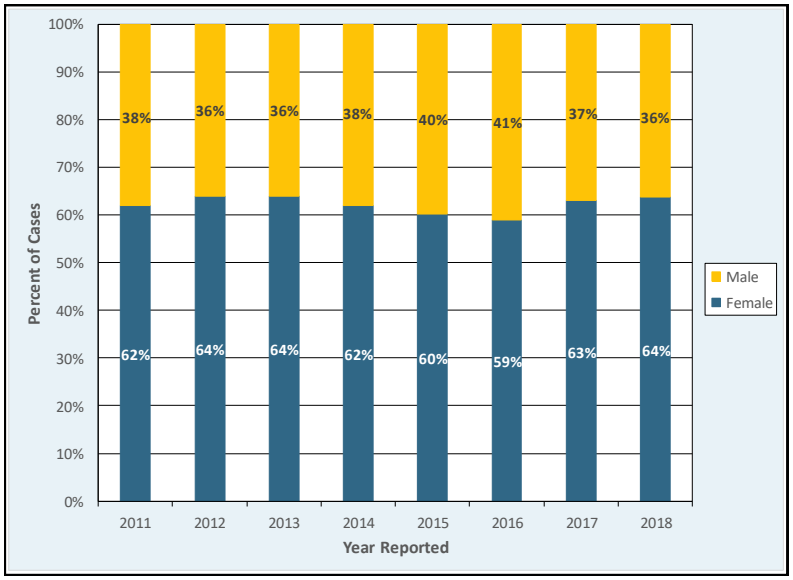


Figure 46. Chlamydia by Gender, Davis County, 2011-2018



Gonorrhea

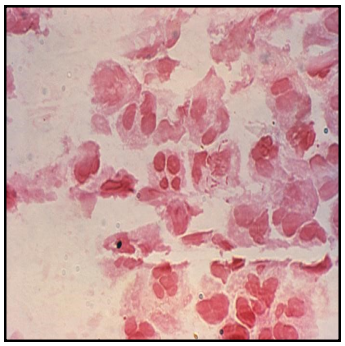
2018 Overview

During 2018, 223 cases of gonorrhea were reported in Davis County.

Gonorrhea infections in Davis County are more frequent in males.

Davis County continues to have lower rates of gonorrhea when compared with Utah and the United States.

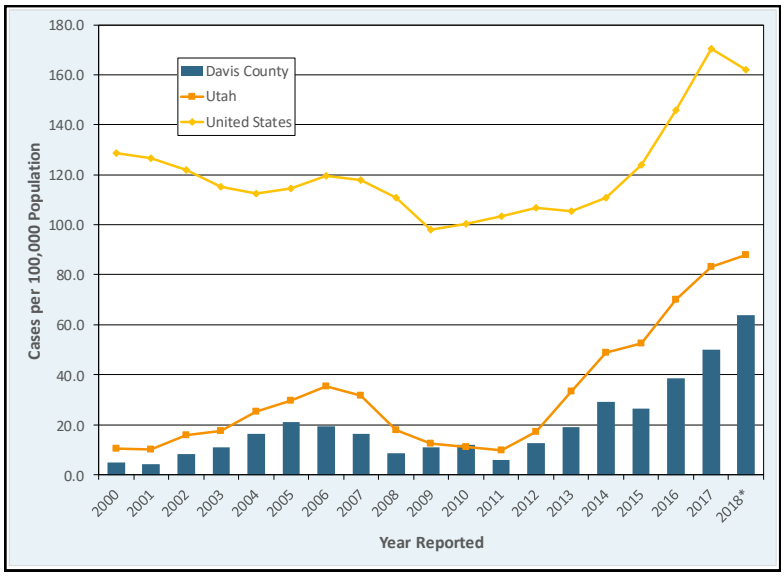
Gonorrhea is a sexually transmitted disease caused by the bacteria *Neisseria gonorrhoeae*. Gonococcal infections are often asymptomatic in women and are becoming increasingly so in men. If left untreated, gonorrhea may result in serious complications including chronic pain, infertility, septic arthritis, hepatitis, endocarditis, and meningitis. Gonorrhea is complex and has the ability to develop resistance to antibiotics. Fluoroquinolones are no longer recommended by the Centers for Disease Control and Prevention due to increasing resistance. Cephalosporins are the only remaining antibiotic class recommended for treatment.



Gonorrhea has progressively developed resistance to several antibiotics used to treat it.

During 2018, there were **223** cases of gonorrhea reported in Davis County, a 30.4% increase from the 171 cases reported during 2017. Although increases in gonorrhea rates have been observed in both Davis County and Utah, their rates continue to be well below the rate seen in the United States (see Figure 47).

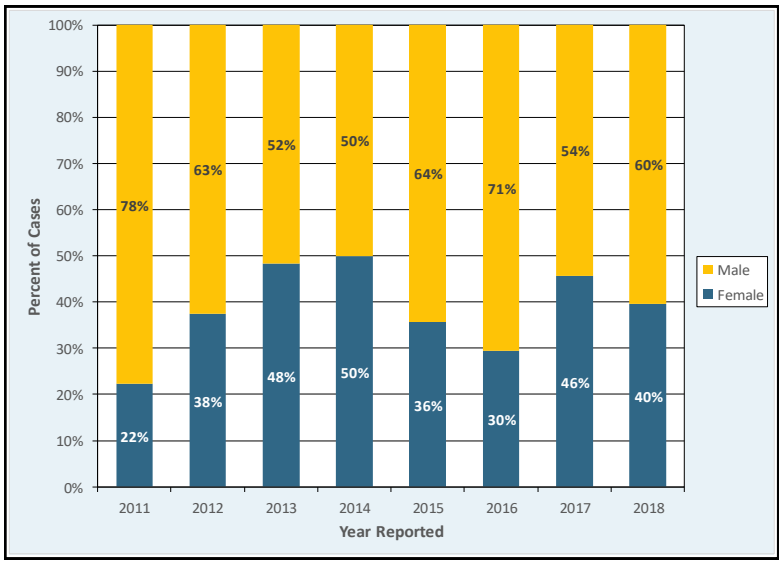
Figure 47. Incidence of Gonorrhea, Davis County, Utah, U.S., 2000-2018



*Utah and United States 2018 data are provisional.

Unlike chlamydia, gonococcal infections in Davis County were more frequent in males (see Figure 48). Disease interviews identified men who have sex with men (MSM), multiple sex partners, anonymous partners, incarceration, and substance abuse as common risk factors for gonococcal infection.

Figure 48. Gonorrhea by Gender, Davis County, 2011-2018



The median age of those infected was 24 years (see Figure 49). This represents a slight decrease from 2017 when the median age was 25. Davis County continues to see a rise in gonococcal infections in the younger, heterosexual population.

In 2018, significantly more cases reported they were MSM when compared to 2017. When evaluating the percentage of gonorrhea cases from each city who reported being MSM, North Salt Lake had the highest percentage of cases who reported they were MSM (77%). A large percentage of cases in every other city, with the exception of Centerville, reported they were MSM (see Figure 50).

A urine sample can be used to screen for both gonorrhea and chlamydia. This less-invasive testing process is more appealing to patients and may encourage sexually-active individuals to seek testing. When patients are participating in rectal or oral intercourse, however, some STDs may be missed if exclusively using the conventional urine test. Medical providers are encouraged to include rectal/oral swabs in STD screenings for patients that engage in rectal and/or oral intercourse. Another testing option involves self-collected specimens. Studies have shown that self-collected rectal/oral specimens had test results that were of equal or better accuracy than those collected by clinical providers.

Consequently, DCHD worked during the last year to update standard operating procedures so that, beginning in 2019, rectal and oral testing will be available to high-risk patients and their partners. DCHD plans to trial the new procedures and hopes to implement them in our STD Screening Clinic in the near future. DCHD also plans to analyze laboratory data to identify how many cases of infection would have been missed if only traditional testing had been completed.

Figure 49. Gonorrhea by Age and Gender, Davis County, 2018

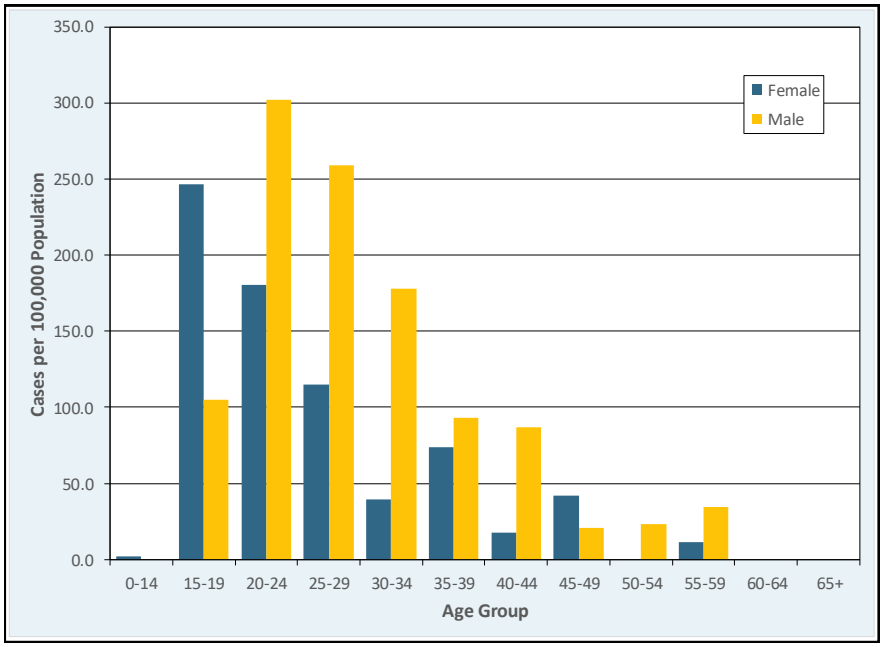
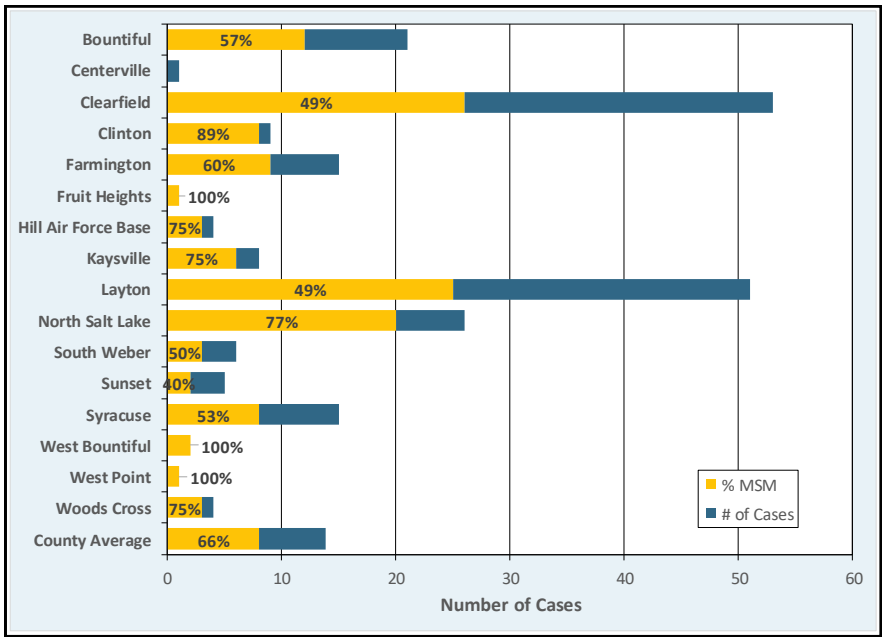


Figure 50. Gonorrhea Cases and % Reporting as MSM by City, Davis County, 2018



Syphilis

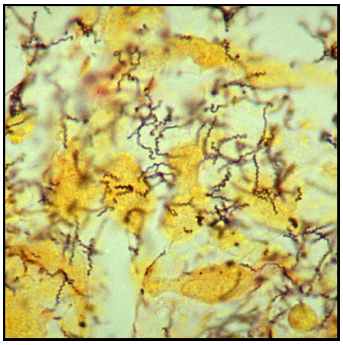
2018 Overview

A total of 36 cases of syphilis were reported during 2018 in Davis County.

In 2018, half of those infected with any stage of syphilis reported they were men who have sex with men (MSM).

The rate of syphilis has increased in Davis County in recent years.

Syphilis is a sexually-transmitted disease caused by the bacterial spirochete *Treponema pallidum*. Syphilis in adults are classified in stages: *primary*, *secondary*, *early latent*, and *late latent* syphilis. Syphilis is usually transmitted from person-to-person by direct contact with a syphilitic sore, known as a chancre, during sexual contact. Pregnant women with the disease can transmit it to their unborn child. Transmission to an unborn fetus causes congenital syphilis and can result in miscarriages, stillbirths, and death.



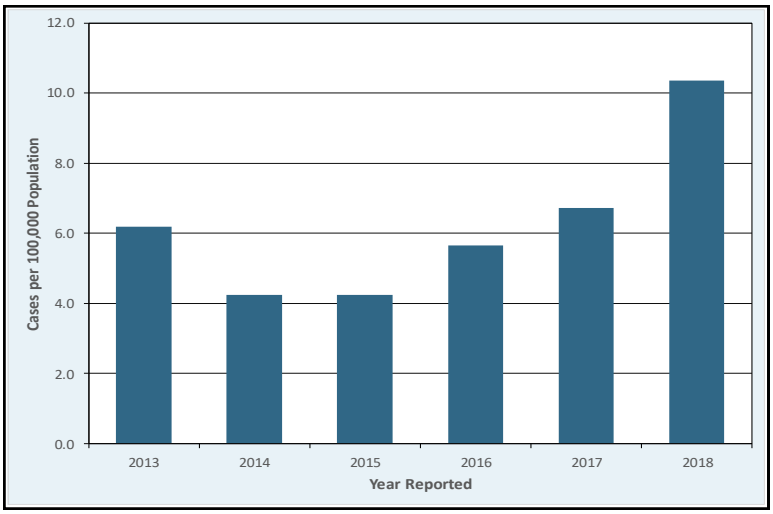
Syphilis is an STD that can cause long-term complications if not treated correctly. Symptoms in adults are divided into stages: *primary*, *secondary*, *early latent*, and *late latent* syphilis.

Syphilis has been called "The Great Pretender" as its symptoms can mimic many other diseases. The painless sore that appears initially when a person is first infected can be confused as a pimple or other seemingly harmless lesion. However, many of these syphilitic sores develop in the rectum or vagina and are not noticed. Thus, most transmission is from persons who are unaware of their infection. Over the past several years, syphilis has continued to increase among men who have sex with men (MSM). Recent national outbreaks among MSM have been marked by high rates of coinfection with human immunodeficiency virus (HIV) and high-risk sexual behaviors.

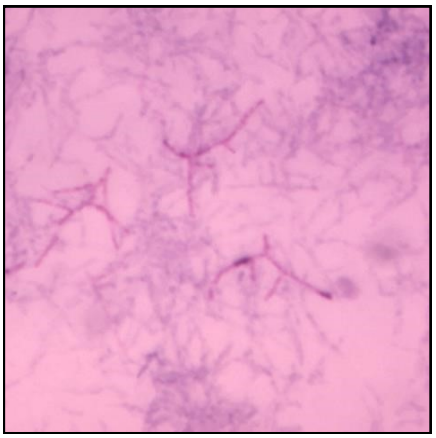
During 2018, there were **36** cases of syphilis reported in Davis County (see Figure 51). This is a 56.5% increase compared to 2017 when 23 cases were reported. Seven cases were classified as *primary,* nine as *secondary*, seven as *early latent*, and 13 as *late latent*.

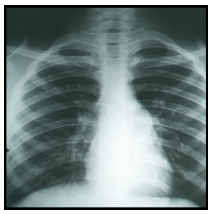
Through disease investigations, it was noted that half of those infected with any stage of syphilis were men who have sex with men (MSM). Other identified risk factors include unprotected anal sex, injection drug use (IDU), multiple sex partners, anonymous sex with individuals of unknown STD/HIV status, and substance abuse. Only a few individuals were diagnosed with symptoms.

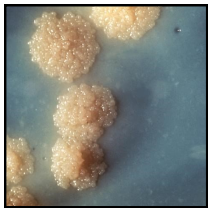
Figure 51. Incidence of Syphilis, Davis County, 2013-2018



The staging of syphilis is difficult and requires obtaining a thorough history (including past test results), risk factors, previous treatment regimens, and evaluation of symptoms. Partners' disease status also helps in the staging process. The later stages of infection require a more rigorous treatment protocol.







Tuberculosis

Tuberculosis (TB) is a disease caused by bacteria that are spread from person to person through the air. TB usually affects the lungs, but can also affect other parts of the body, such as the brain, kidneys, or spine.

Tuberculosis (TB) is caused by a type of bacteria called *Mycobacterium tuberculosis.* The bacteria usually attacks the lungs, but may attack any part of the body. It is typically spread through the air when a person with TB expels tiny, airborne particles. People nearby may breathe in these particles and become infected. Not everyone infected with TB bacteria becomes sick. As a result, two TB conditions exist: active TB disease and latent TB infection.

Approximately one-third of the world's population and 9 to 14 million people in the United States are infected with TB. On average, 10% of infected individuals will develop active tuberculosis at some point in their lives.

By the early 1980s, TB was considered to be under control and many states redirected TB prevention and control funds to other programs. As a result, the country experienced a resurgence of TB, with a 20% increase in cases reported between 1985 and 1992. Since then, the number of TB cases reported annually has decreased. With the introduction of HIV, TB rates remain a constant threat as it is a leading cause of death among those infected with HIV. Also, a new virulent strain of TB, extensively drug-resistant tuberculosis (XDR-TB), has been identified. This strain is resistant to many drugs used to treat tuberculosis and has a high mortality rate.

Davis County had **no** new active tuberculosis disease cases (see Figure 52) and **163** newly identified latent tuberculosis infections in 2018 (see Figure 53).

Figure 52. Active Tuberculosis Cases by Year, Davis County, 2002-2018

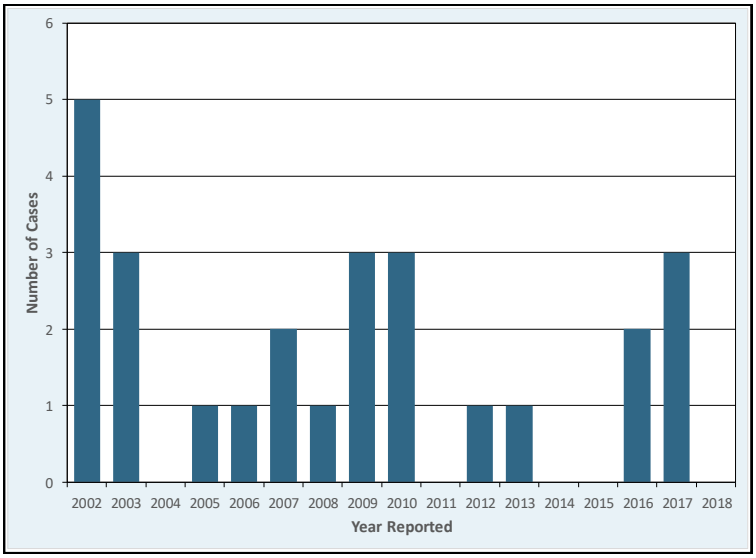
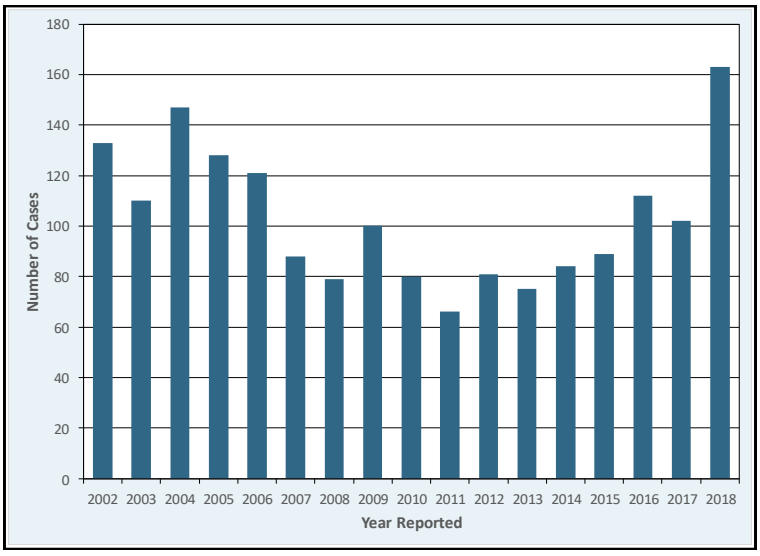


Figure 53. Latent Tuberculosis Infections (LTBI) by Year, Davis County, 2002-2018



Active Tuberculosis Disease

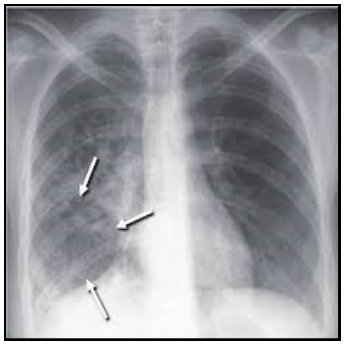
2018 Overview

No new cases of active tuberculosis were reported in Davis County in 2018.

On average, Davis County investigates about one case of active tuberculosis each year.

In the United States, tuberculosis is primarily seen in individuals who are foreign-born or traveled/lived in endemic countries.

TB bacteria become active if the immune system cannot stop them from growing. When TB bacteria begin to multiply in the body, it is called active tuberculosis disease (ATBD). When ATBD manifests in the lungs, it is known as pulmonary TB. Whereas, when it manifests in other parts of the body, it is classified as extra-pulmonary TB.



TB is a disease caused by *Mycobacterium tuberculosis.* This bacteria usually attack the lungs, but can attack any part of the body, such as the kidney, spine, and brain.

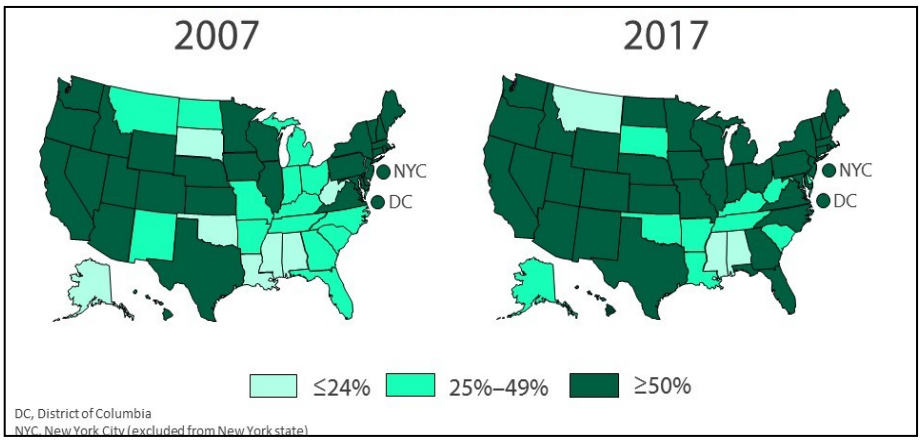
In 2017, 10 million people worldwide became sick with ATBD resulting in approximately 1.3 million TB-related deaths. In the United States, there were 9,105 TB cases in 2017 (2.8 cases per 100,000 persons). This represents a 1.8% decrease compared to cases reported in 2016. This is the lowest case count on record in the United States. In the United States, tuberculosis is primarily seen in individuals who are foreign-born or have traveled/lived in endemic countries (see Figure 54).

Utah had **18** confirmed cases (0.6 cases per 100,000 persons) reported in 2018. Davis County, on the other hand, had **no** new cases of active tuberculosis identified in 2018.

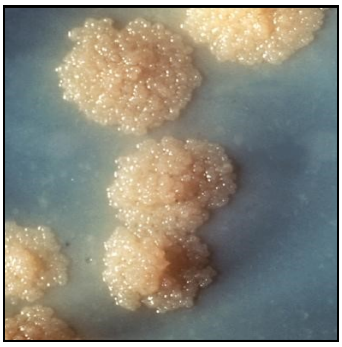
Management of active tuberculosis cases requires close collaboration between several agencies including local health departments, medical providers, the Utah Department of Health, the Utah Public Health Laboratory, and a commitment from the infected individual. Both pulmonary and extra-pulmonary TB typically require six months of treatment. Complicated cases of tuberculosis can require treatment to be extended up to two years (e.g. meningeal, multi-drug resistant/extensively-drug resistant (MDR/XDR)).

Patients with infectious pulmonary tuberculosis, which is of most concern for public health, are isolated until sputum sample tests indicate the individual is no longer infectious. To ensure compliance to treatment, medication is administered under Directly Observed Therapy (DOT). Because DOT can seem personally invasive to the patient, strategies to promote a less intrusive and more flexible schedule are implemented whenever possible. These include bi-weekly/ tri-weekly treatments, home visits, and video-conferencing.

Figure 54. Percentage of TB Cases Among Foreign-born Persons, United States, 2007 & 2017



Latent tuberculosis infection (LTBI) is a condition in which tuberculosis bacteria are alive, but inactive in the body. People with LTBI have no symptoms, cannot spread TB to others, and usually have a positive skin test reaction or interferon gamma-release assay (IGRA) blood test. Development into active disease occurs in about 10% of those who do not receive treatment for LTBI.



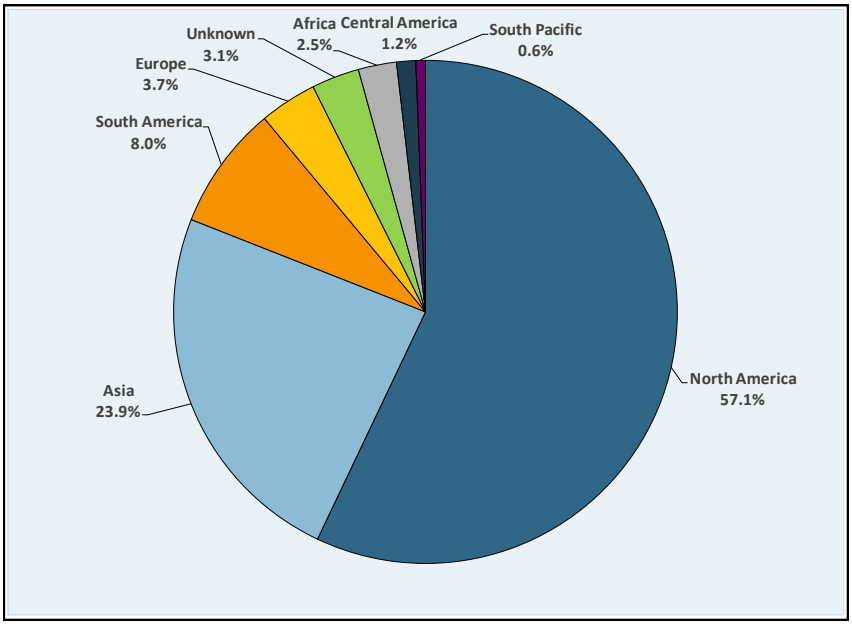
Persons with LTBI do not feel sick and do not have any symptoms. They are infected with *M. tuberculosis*, but do not have TB disease.

Approximately 200 clients are referred to Davis County Health Department (DCHD) annually for tuberculosis evaluation. These evaluations can include interviews, repeat skin testing or blood screening tests, chest x-rays, sputum testing, and physical exams in order to provide an accurate diagnosis.

With the low incidence of active tuberculosis disease in Davis County and Utah as a whole, the largest disease burden for tuberculosis falls under LTBI. During 2018, Davis County managed **163** clients with LTBI, with an average of **14** LTBI patients per month. Treatment reduces the risk that latent TB will progress to active disease and is essential to the control and elimination of tuberculosis disease. Case management includes initial testing to rule out active disease and ensuring appropriate treatment of the infection. The majority of individuals who receive LTBI treatment in Davis County are foreign-born (see Figure 55).

Typically, treatment for LTBI consists of daily antibiotic therapy for three to nine months. Individuals are monitored throughout therapy, but DOT is not necessary. In October 2012, use of a new LTBI treatment recommended by CDC was implemented in Utah. This new regimen is a combination of two drugs, taken once weekly for 12 doses. It is recommended for persons age two or older who are otherwise healthy, but also meet a certain set of criteria.

Figure 55. LTBI by Place of Birth, Davis County, 2018



2018 Overview

During 2018, Davis County managed 163 patients with LTBI.

The majority of individuals who receive LTBI treatment in Davis County are foreign-born or traveled/lived in endemic countries.

DCHD provided 1,041 tuberculin skin tests to the public in 2018.

Davis County receives referrals for suspect active and latent tuberculosis from various medical facilities and providers. Screening tests consist of a tuberculin skin test (TST) or blood test (e.g. Quantiferon-Gold). Those with positive test results are often referred to the health department for evaluation and treatment. LTBI is not a reportable condition, but free or low-cost services are available for the community.

Davis County managed LTBI patients of almost all ages (see Figure 56). The age group with the highest frequency of cases was 30-34 years.

DCHD provided **1,041** tuberculin skin tests to the public in 2018. However, these numbers only account for a small percentage of all TB tests performed in the community. Most often, those who sought TB testing through DCHD did so for a job or school requirement (86.0%). Other reasons included pre- and post-mission requirements (4.9%), refugee or immigrant requirements (1.8%), personal choice (1.4%), exposure to TB (0.6%), volunteer requirements (0.6%), substance abuse (0.2%), immunocompromised (0.1%), homeless (0.1%), and unknown (4.2%) (see Figure 57).

Figure 56. LTBI by Age Group, Davis County, 2018

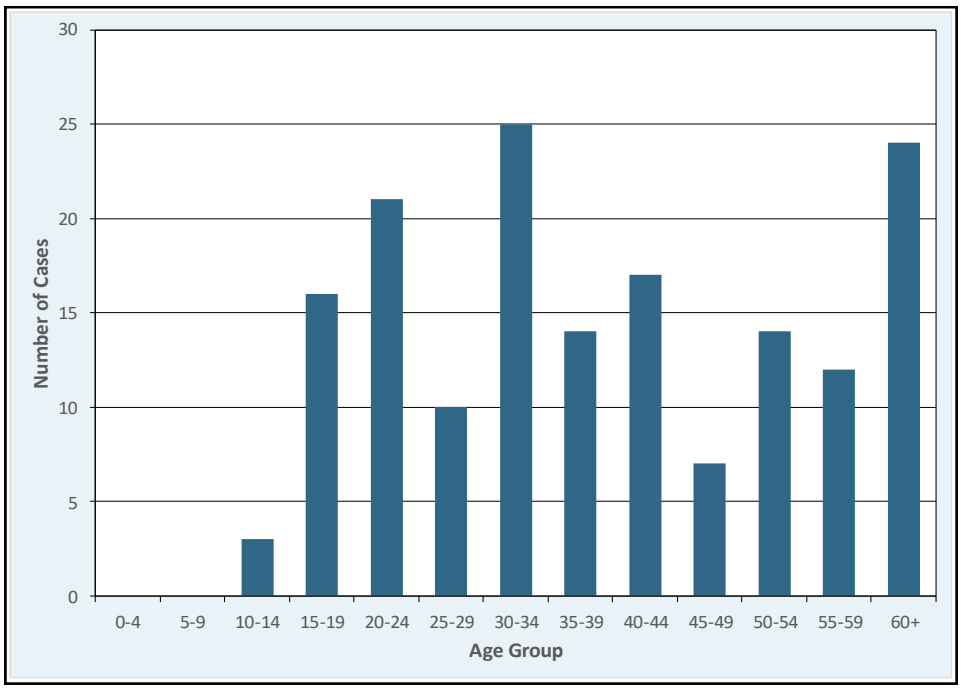
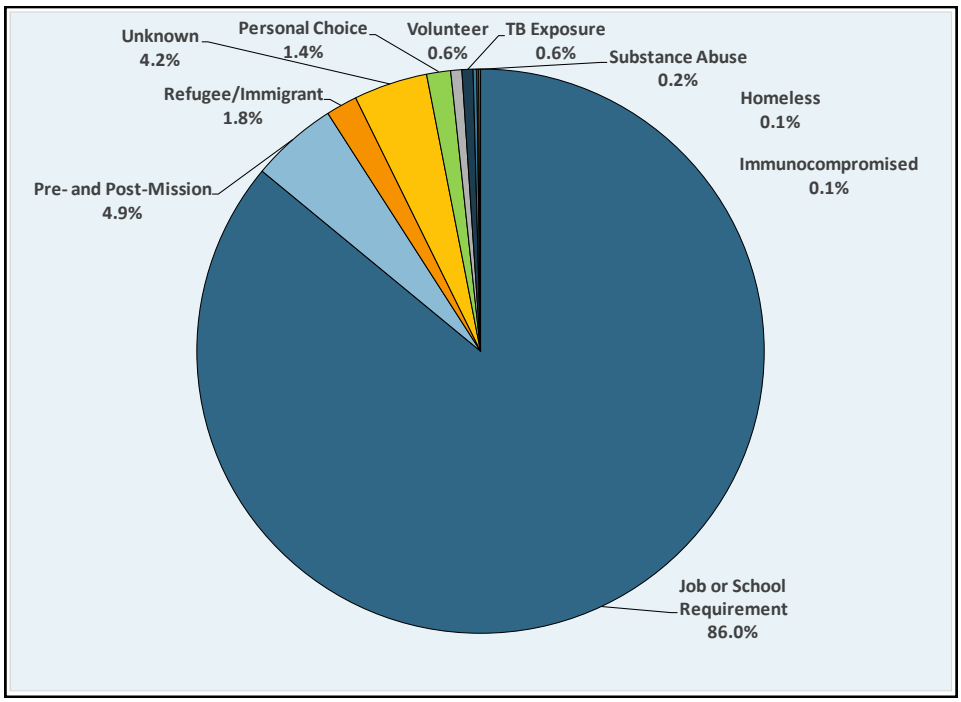


Figure 57. Reasons for TB Testing, Davis County Health Department (DCHD), 2018



During 2018, several program activities were implemented to address disease trends and enhance community education.

STD/HIV Program Highlights:

Low-Cost STD/HIV Screening Clinic

Access to STD testing has been noted as a barrier by those who are sexually active and at-risk. As a result, DCHD partners with Midtown Community Health Center - Davis (MTCHC) to offer low-cost screening to residents through their clinic. Two options are available to the community:

- **Low-Cost Screening Clinic:** This is a walk-in clinic where individuals can access STD screening Monday through Friday (8:00am - 5:00pm). Individuals are provided educational materials on STD/HIV and offered testing—a physical exam is not performed. DCHD provides the results of the testing and conducts further investigation and treatment. Testing supplies and medications are provided by the health department. MTCHC provides a medical assistant who is responsible for collecting the specimens.

  During 2018, approximately **307** clients received testing through the low-cost clinic. Davis County identified 20 positive chlamydial, seven gonococcal, nine syphilis, and two HIV infections—an STD infectivity rate of 12%.

- **Provider Exam STD Testing:** Individuals who are symptomatic can receive STD services through MTCHC. Clients may make an appointment to see a medical provider, obtain a physical examination, and be tested for chlamydia, gonorrhea, HIV, and syphilis (if the individual is at-risk). Additional tests are available for an added fee. Testing is provided by MTCHC. If test results are positive, MTCHC treats the patient and refers the case to DCHD for risk-reduction counseling and investigation. In 2018, **114** patients were tested by Midtown Clinic through this program.

STD/HIV Contact Clinic

Individuals who test positive for any of the reportable STDs (chlamydia, gonorrhea, syphilis, HIV, and chancroid) are interviewed to identify exposed sexual contacts. Contacts are located, tested, and treated by DCHD at no charge. In 2018, **128** individuals were seen in the STD/HIV Contact Clinic:

- **53** tested positive for chlamydia (41%)
- **Six** tested positive for gonorrhea (5%)
- **Eight** tested positive for syphilis (36%)
- **One** was confirmed positive for HIV (17%) through conventional blood testing.

Overall, this represents an infectivity rate of 53%. Contacts to positive cases are at high risk of acquiring infection and the data reiterates the importance of contact tracing in the control of STDs.

The most common test to detect both gonorrhea and chlamydia is a urine sample. Because rectal/oral intercourse is becoming increasingly common (and because these infections tend to be location-specific), traditional STD screening using the urine test many not identify all infections. CDC recommends testing from other sites, such as the rectum and pharynx, to identify all sources of infection.

Consequently, DCHD worked during the last year to update standard operating procedures so that, beginning in 2019, rectal and oral testing will be available to high-risk clients in the STD/HIV Contact Clinic. DCHD plans to trial the new procedures and hopes to implement them in the Low-Cost Screening Clinic in the future. DCHD also plans to analyze laboratory data to identify how many cases of infection would have been missed if only traditional testing had been completed.

Rapid HIV Testing

Traditional HIV testing may take up to 10 days for results. To decrease the wait time, DCHD conducts free rapid HIV clinics throughout the year, often in conjunction with national HIV and STD events. Results are available in 20 minutes. Rapid testing is also performed in the STD/HIV Contact Clinic. In 2018, **74** rapid HIV tests were administered. Those that are positive by rapid test receive follow-up confirmatory testing performed at UPHL. DCHD staff administering the tests are trained to give positive test results and provide important resources to infected clients.

During 2018, DCHD participated in an HIV screening event at the Weber State University - Davis campus. DCHD nurses coordinated two screening sessions to accommodate students' variable schedules. In total, DCHD tested 18 individuals, none of which were positive. Weber State University administrators were pleased with the success of the event and would like to facilitate routine screening events in the future.



Targeted Sexually Transmitted Disease (STD) Testing Grant

DCHD recently applied for and was awarded supplemental funding through the *Targeted Sexually Transmitted Disease (STD) Testing Grant*. These funds will be used for STD testing for uninsured and underinsured individuals in both the Low-Cost Screening Clinic & STD/HIV Contact Clinic beginning in 2019. These additional funds may also expand DCHD's capability to perform additional rectal and oral testing.

Limited Chlamydia Investigations

Effective January 1, 2019, Utah's public health procedures no longer require local health departments to attempt to investigate all cases of chlamydia. Local health departments will individually determine local chlamydia case investigation procedures. Chlamydia remains as a reportable infection and healthcare providers and laboratories are still required to report cases within three working days from the time of identification. Beginning in 2019, DCHD has elected to investigate cases of chlamydia that fall among those that are (1) ≤ 21 years old, (2) co-infected with another STD, or (3) known to be a man who has sex with men (from report or a previous disease event). DCHD plans to evaluate this determination to ensure that the most at-risk groups are provided with treatment and effective education.

Community Involvement

In order to better serve and care for HIV positive residents and their partners, DCHD participates in the statewide Utah HIV Planning Group (UHPG). This group is comprised of local health department representatives, UDOH staff, infectious disease physicians, community partners, and HIV-infected individuals. Together the group discusses updates on HIV issues, best-care practices, how to motivate clients to stay in care, service gaps, and how to incorporate support systems into various agency program activities.

Additionally, DCHD applied for and was awarded funding through the *Personal Responsibility Education Program (PREP)* grant in 2018. Funding through the PREP grant will be used to implement an evidence-based program to

educate Clearfield Job Corps Center residents on abstinence and contraception to prevent adolescent pregnancy and sexually transmitted diseases in 2019. The program will also incorporate additional adulthood preparation subjects, including healthy relationships, education and career success, financial literacy, healthy life skills, parent-child communication, and/or adolescent development. DCHD is excited to partner with Clearfield Job Corps Center to bring an STD education program back to their campus.

HIV PrEP Education

HIV pre-exposure prophylaxis (PrEP) helps prevent an HIV-negative person from getting HIV from a sexual or injection-drug-using (IDU) partner who is positive. PrEP, when used with other safer sex practices (e.g. condoms), can provide even greater protection. CDC reports that PrEP reduces the risk of getting HIV sexually in high-risk individuals by up to 92%, when used consistently. PrEP can also reduce the risk of getting HIV by 49-74% among people who inject drugs. With the availability of this new intervention tool, DCHD is now providing education on PrEP to men who have sex with men (MSM), IDUs, and women with high-risk partners (e.g. MSM, IDUs, and those infected with HIV and/or syphilis).



Tuberculosis Program Highlights:

Directly Observed Therapy

Residents who have developed active TB need to receive appropriate treatment for their disease. Failure to comply with the established treatment regimen can result in the development of drug resistance. To prevent this from occurring, treatment must be administered under directly observed therapy (DOT). This requires a health department staff member to observe the patient taking their medication daily or (when possible) three times a week. This process can make it difficult for clients to maintain normal day-to-day activities and can incur travel costs to the patient and/or health department staff. To address this issue, DCHD offers clients a video-conferencing option where those with a history of compliancy can be observed taking their medication through applications such as Skype or FaceTime. The TB nurse conducts periodic face-to-face encounters to ensure that any possible treatment side effects are recognized. This option is only considered for individuals who display responsible behaviors and are low-risk for complications.

Community Involvement

Salt Lake County Health Department has a specialized clinic that is staffed with contracted providers who are experts on TB and Hansen's disease. This clinic is made available to all local health departments free of charge. DCHD uses this clinic to assist with diagnosis, treatment, and case management of unique or difficult cases of TB and Hansen's disease. For all other active TB cases, UDOH and DCHD partner with Dr. Gary Alexander, MD (pulmonologist) for consultation, evaluation, and treatment management. Dr. Alexander has been a valuable resource to DCHD's TB program. His expertise in tuberculosis continues to play a vital role in the successful treatment and care of clients. Dr. Alexander also serves on DCHD's Board of Health.

DCHD has also partnered with Midtown Community Health Center (MTCHC) to conduct physical evaluations and prescription management for Davis County residents who have Latent Tuberculosis Infection (LTBI). Clients receive a full medical exam from an MTCHC provider to determine capability and appropriateness of LTBI treatment. Throughout the course of treatment, which typically is nine months, the MTCHC providers are available for consultation and other needed workups.

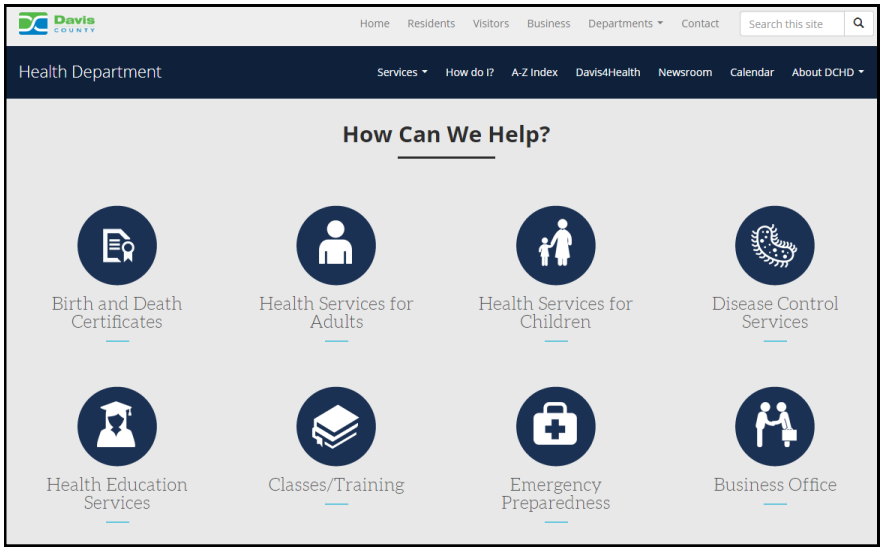
Hansen's Disease

Hansen's disease (leprosy) also falls under the Tuberculosis Program. Every few years a case of Hansen's disease is reported to the health department. Treatment and case management for Hansen's disease can be anywhere from 6 months to two years, depending on the type of infection and treatment regimen. In 2014, DCHD received report of a Hansen's disease case. This patient followed a two-year treatment plan and completed treatment in October 2016. In 2017, this individual encountered a relapse of infection and is currently undergoing re-treatment. A second case of Hansen's disease (unrelated to the first case) was also diagnosed in 2017. This patient is also undergoing a two-year treatment regimen which included daily DOT for the first several weeks of treatment, but is now being monitored monthly through conclusion of treatment. Those being treated for Hansen's disease take daily medication provided by the National Hansen's Disease Program in Baton Rouge, Louisiana.

Overall Division Highlights:

Davis County Health Department Website

The Communicable Disease and Epidemiology (CD/Epi) Bureau website remains a valuable resource for the community. Visitors to the website can access program specific information, as well as links to other important websites. Materials are available for each of the programs within the CD/Epi Bureau. It also offers information specific to healthcare professionals and medical providers—including reporting guidelines, current disease data for Davis County, and links to Utah's Communicable Disease Rule. These resources are available at: http://www.daviscountyutah.gov/health.



Ask-A-Nurse Email

The Ask-A-Nurse email is routinely utilized by the public for answers to communicable disease issues. This system is monitored daily by DCHD nurses who provide information on health issues pertaining to infectious diseases or other reportable conditions. An email link is found on each page of the CD/Epi web pages or can be accessed at: ask-a-nurse@daviscountyutah.gov.

Healthcare-Associated Infections Grant

Davis County continued to receive funding to assist in the identification and control of healthcare-associated infections (HAI). In 2018, HAI outbreaks were detected and control efforts were implemented smoothly, due in part to a collaboration between public health and private healthcare systems.

DCHD continues to work closely with the medical community on HAI issues and provide healthcare partners with updated information on new and emerging infections. Each year, drug-resistant organisms are identified through enhanced drug susceptibility testing, which in turn facilitates better outcomes for the patient and the facilities where they reside.

Program Highlights

In 2018, UDOH partnered with Association for Professionals in Infection Control and Epidemiology (APIC) to offer an educational course for long-term care facilities and their partners with a goal to provide more effective infection control and prevention. DCHD was been able to send the Lead Infectious Disease Nurse to participate in this multi-day training. Upon conclusion, the nurse can sit for a certification exam that will add to DCHD's capacity to respond to HAI issues.

EMS Program

OSHA Standard - 29 CFR 1910.1030 mandates that all employees considered at risk for bloodborne pathogen (BBP) exposure receive exposure training and annual updates. In an effort to assist Davis County Sheriff's Office (DCSO) and other Emergency Medical Services (EMS) agencies within Davis County, DCHD provides bloodborne pathogen training once a month. This class is free of charge. It is also available off-site for a nominal fee. In conjunction with the BBP training, DCHD also provides baseline testing for DCSO and other EMS agencies within Davis County. To be protected under the EMS law, employees must be tested at start of employment, again in 3-6 months, and at termination.

Davis County provided EMS/public safety employee services to other community agencies for well over 26 years. However, DCHD's ability to continue doing so was no longer sustainable. As a result, the program closed to outside EMS/public safety agencies and currently focuses only on DCSO employees and Davis County's Search and Rescue program.

Internship Program

The CD/Epi Bureau maintains an internship program for public health interns to gain work experience in the public health field. This is an ongoing partnership that the CD/Epi Bureau continues with several universities in the area. During 2018, the CD/Epi Bureau received a student intern from Weber State University.

National Syndromic Surveillance Program (NSSP)

DCHD continues to actively participate in the National Syndromic Surveillance Program (NSSP). Late in 2016, the BioSense surveillance system was replaced with ESSENCE, a more robust syndromic surveillance platform that allows public health professionals to capture, analyze, store, and share syndromic surveillance data. Syndromic surveillance continues to provide public health with real-time data regarding the health status of the community as it captures information regarding emergency department visits and hospitalizations from multiple sources.

In 2018, ESSENCE was used to track the presence of influenza-like illness, acute gastrointestinal illnesses, measles, mumps, animal bites, hepatitis A, and respiratory illnesses. The epidemiologist is alerted by ESSENCE when emergency department and clinic visits for identified symptoms reach a pre-determined threshold. Data from these alerts are analyzed to identify clusters of illness or diseases of concern.

igotsick.health.utah.gov Website

DCHD monitors a statewide website for reporting suspect foodborne illnesses. This system allows the general public to report illnesses that may be related to food consumed at home, in a restaurant, or in a group setting. Once a report is submitted, it is routed to the appropriate jurisdiction for review. DCHD has been able to utilize these reports to identify outbreaks that were occurring in the community. This system helps to identify outbreaks earlier, making the implementation of control measures more timely and limiting the number of people affected.

Zika Virus Preparedness Efforts

Zika virus continues to be an issue throughout the world, particularly among those who traveled to areas with active transmission and were pregnant. DCHD and UPHL continue to provide qualifying individuals with free testing for Zika virus. In 2018, Davis County provided or facilitated testing for seven female and seven male residents.

Animal Control Collaboration

The CD/Epi Bureau, in collaboration with Davis County Animal Care & Control, developed a human rabies exposure reporting system which has facilitated a more timely and efficient process for both agencies. The health department evaluates and monitors reported human exposures and assists in the facilitation of post-exposure prophylaxis, when recommended. In 2018, DCHD evaluated **332** incidents where exposure to an at-risk animal occurred.

New guidance was made available in 2017 that made changes to the quarantine recommendations for unvaccinated animals exposed to a rabid animal. In previous years, the recommendation to quarantine dogs, cats, and ferrets was for six months post-exposure. The new recommendations reduced the time of quarantine for dogs and cats to four months (with ferrets remaining at six months). The new guidance was implemented by Davis County Animal Care & Control and is anticipated to be a benefit to animal owners in the county. These changes are reflected in the Davis County Board of Health *Rabies Prevention and Control Regulation,* which will likely be approved by the Board of Health in February 2019.

School Absenteeism Project

DCHD continued their partnership with Davis School District (DSD) and the University of Utah Division of Public Health to develop an online platform for school absenteeism analysis. The School Absenteeism Surveillance System (SASS) generates automatic daily uploads of absenteeism data from DSD to the platform, analyzing and displaying data at district-, school-, and classroom-levels. DCHD continues to use the platform to monitor aberrations in absenteeism while minimizing the amount of time required to do so. The platform has the potential to inform DCHD and DSD of potential developments in minimal time, such that public health interventions can be initiated more efficiently.

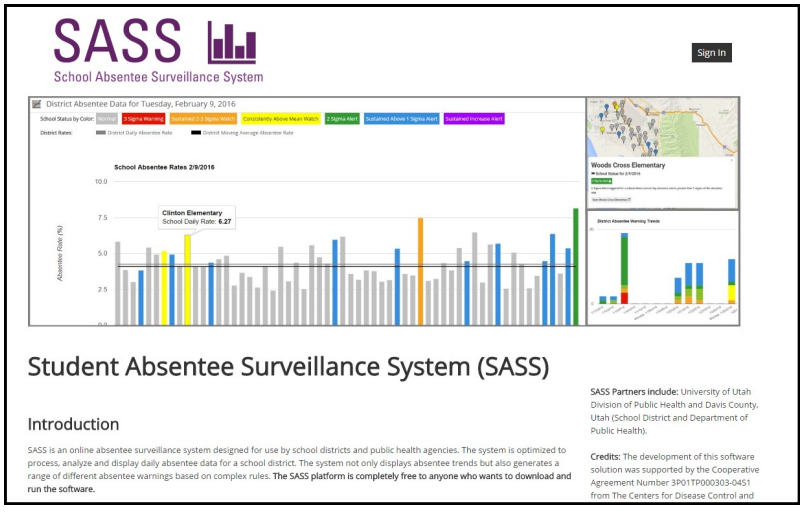


Table 7. Davis County Population, by Age Group*

Age Group	Population
<1 year	5,856
1-14 years	88,128
15-24 years	49,766
25-44 years	99,730
45-64 years	68,931
65-84 years	30,329
85+ years	3,897
Total	**347,637**

Table 8. Davis County Population, by Gender*

Gender	Population
Male	175,317
Female	172.320
Total	**347,637**

Table 9. Davis County Population, by Race*

Race	Population
White	321,022
Black	4,914
American Indian or Alaskan Native	2,543
Asian	7,020
Native American or Pacific Islander	2,870
2 or More Races	9,268
Total	**347,367**

Table 10. Davis County Population, by Ethnicity*

Ethnicity	Population
Hispanic or Latino (of any race)	33,575

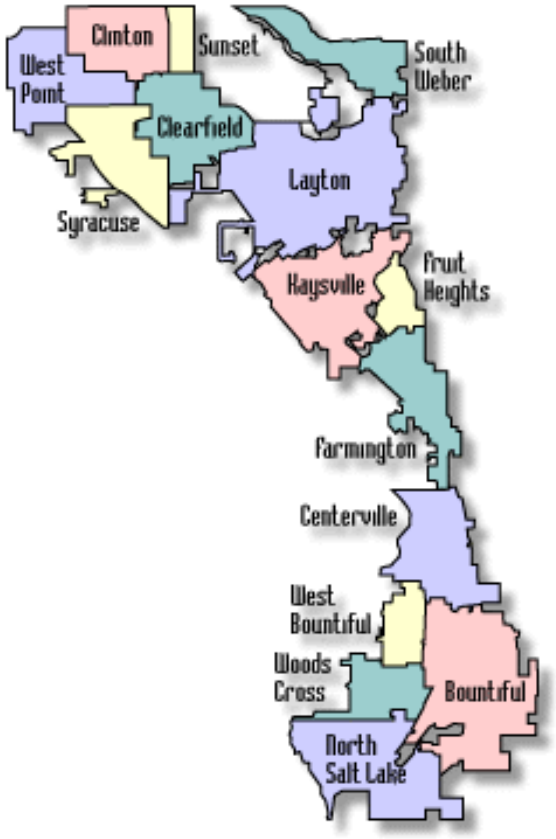


Table 11. Davis County Population, by City*

City	Population
Bountiful	44,107
Centerville	17,657
Clearfield	31,363
Clinton	21,971
Farmington	24,066
Fruit Heights	6,215
Hill Air Force Base	3,606
Kaysville	31,776
Layton	75,655
North Salt Lake	20,507
South Weber	7,310
Sunset	5,286
Syracuse	29,507
Unincorporated County	1007
West Bountiful	5,650
West Point	10,603
Woods Cross	11,351
Total	**347,637**

*Population estimates for 2018 are not yet available. These figures represent the estimates for 2017.

Source: Retrieved January 2019 from Utah Department of Health, Center for Health Data and Informatics, Indicator-Based Information System for Public Health. Available at: https://ibis.health.utah.gov/