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ACKNOWLEDGEMENTS

This report was prepared by the Salt Lake County Health Department, Medical Division, Epidemiology and Infectious Disease Bureaus.

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The authors wish to thank the following individuals within the Salt Lake County Health Department for their consultation and support.

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Dagmar Vitek, MD, MPH  Medical Director
Dorothy Adams, MPA, LEHS  Deputy Director
Ilene Risk, MPH  Epidemiology Bureau Manager
Tair Kiphibane, RN, BSN  Infectious Disease Bureau Manager
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This report is found at https://slco.org/health/epidemiology/


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EXECUTIVE SUMMARY

Utah law requires that over 70 infectious diseases be routinely reported to public health for ongoing surveillance and investigation. Reportable data are collected from laboratories, hospitals, medical providers and outpatient clinics. Salt Lake County Health Department Epidemiology and Infectious Disease Bureaus then investigate each report through patient interview and/or chart abstraction and analyze the data. The results of the data analysis are utilized to implement appropriate control and prevention measures. In 2018, over 15,000 disease reports were investigated to determine the source of infection and interrupt disease transmission.

The Salt Lake County Health Department 2018 Infectious Diseases Morbidity Report summarizes data for the most commonly reported infectious diseases affecting Salt Lake County residents. These disease profiles present relevant demographic, clinical and epidemiologic data.

I hope this report can be a resource for healthcare providers, public health practitioners, community partners and the public, and that it can be used to help target intervention and prevention efforts.

Sincerely,

Dagmar Vitek, MD, MPH
Medical Director
<table>
<thead>
<tr>
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**TOP 10 REPORTABLE DISEASES BY AGE**

<1 year

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<tr>
<td>Chickenpox</td>
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<td>4</td>
</tr>
<tr>
<td>Streptococcal disease, invasive, group B</td>
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<td>4</td>
</tr>
<tr>
<td>Pertussis</td>
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<td>Campylobacteriosis</td>
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<tr>
<td><em>Streptococcus pneumoniae</em>, invasive disease</td>
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*Data suppressed due to low case counts*
## TOP 10 REPORTABLE DISEASES BY AGE

### 1-4 years

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<th>Disease</th>
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<td>Chickenpox</td>
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<td>Salmonellosis</td>
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<tr>
<td>Campylobacteriosis</td>
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</tr>
<tr>
<td><em>Streptococcus pneumoniae</em>, invasive disease</td>
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<tr>
<td>Shiga toxin-producing <em>E. coli</em></td>
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<tr>
<td>Giardiasis</td>
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*Data suppressed due to low case counts*
## TOP 10 REPORTABLE DISEASES BY AGE

### 5-17 years

<table>
<thead>
<tr>
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<th>Cases</th>
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<td>Chlamydia</td>
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<td>Pertussis</td>
<td>73</td>
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<tr>
<td>Gonorrhea</td>
<td>59</td>
<td>3</td>
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<tr>
<td>Influenza, hospitalized</td>
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<td>4</td>
</tr>
<tr>
<td>Chickenpox</td>
<td>40</td>
<td>5</td>
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<tr>
<td>Tuberculosis, latent infection</td>
<td>23</td>
<td>6</td>
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<tr>
<td>Shiga toxin-producing <em>E. coli</em></td>
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<td>7</td>
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<tr>
<td>Giardiasis</td>
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<td>8</td>
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<tr>
<td>Campylobacteriosis</td>
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<tr>
<td>Streptococcal disease, invasive, group A</td>
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<td>9</td>
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<tr>
<td>Cryptosporidiosis</td>
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![Pie chart showing the distribution of the top 10 reportable diseases by age (5-17 years).](image)
### TOP 10 REPORTABLE DISEASES BY AGE

18-49 years

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<td>Influenza, hospitalized</td>
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<tr>
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### TOP 10 REPORTABLE DISEASES BY AGE

#### 50-64 years

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<tr>
<td>Gonorrhea</td>
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<td>3</td>
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<tr>
<td>Chlamydia</td>
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<td>Tuberculosis, latent infection</td>
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<td>Hepatitis B, chronic</td>
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<tr>
<td><em>Streptococcus pneumoniae</em>, invasive disease</td>
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<td>Streptococcal disease, invasive, group A</td>
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<tr>
<td>Campylobacteriosis</td>
<td>39</td>
<td>9</td>
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<tr>
<td>Hepatitis A</td>
<td>28</td>
<td>10</td>
</tr>
</tbody>
</table>

![Pie chart showing the distribution of top 10 reportable diseases by age group 50-64 years.](chart.png)

- Hepatitis C, chronic
- Influenza, hospitalized
- Gonorrhea
- Chlamydia
- Tuberculosis, latent infection
- Hepatitis B, chronic
- *Streptococcus pneumoniae*, invasive disease
- Streptococcal disease, invasive, group A
- Campylobacteriosis
- Hepatitis A
# TOP 10 REPORTABLE DISEASES BY AGE

## 65+ years

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<td>Streptococcal disease, invasive, group A</td>
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<td>Streptococcal disease, invasive, group B</td>
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<td>Tuberculosis, latent infection</td>
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<tr>
<td>Gonorrhea</td>
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<td>9</td>
</tr>
<tr>
<td>Hepatitis B, chronic</td>
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<td>10</td>
</tr>
</tbody>
</table>

![Pie chart showing disease distribution](chart.png)
CAMPYLOBACTERIOSIS

cdc.gov/foodsafety/diseases/campylobacter/index.html

- 206 cases reported
- 18.1 cases per 100,000 population

Campylobacteriosis by age and sex

- 19% of cases were hospitalized
- 0 deaths

Campylobacteriosis by race and ethnicity

- 19% of cases were hospitalized
- 0 deaths

Campylobacteriosis monthly frequency and cumulative incidence rate

- 19% of cases reported foreign travel during their exposure period. Of those cases, the most frequently reported location was Mexico.
- 13% of cases reported natural water exposure, including lakes and streams
- 4% of cases were co-infected with another enteric pathogen, such as salmonella and cryptosporidium

Epidemiologic review

- Two outbreaks were identified. One was associated with a pet shelter and the other was associated with a local restaurant.
- 31% of cases reported bloody diarrhea
- 50% of cases reported contact with puppies or dogs
- The median duration of illness was eight days

Overview
Campylobacteriosis is an infectious disease caused by the Campylobacter bacteria. It is one of the most common causes of diarrheal illness in the U.S.

Symptoms
Symptoms typically include diarrhea (often bloody), fever, abdominal cramps and bloating. Symptoms occur within 2-5 days after exposure and last about a week.

Transmission
Most infections are associated with eating raw or undercooked poultry or contamination transferred to other foods.

Treatment
Most people recover without treatment and antibiotics are only recommended for the very ill.

Prevention
Proper hand hygiene after contact with animals and before eating will help prevent the spread of disease. Avoiding raw milk also helps prevent infection.
Cryptosporidiosis

cdc.gov/parasites/crypto

Overview
Cryptosporidiosis is a disease caused by microscopic parasites called Cryptosporidium. Cryptosporidium or Crypto can be found in water, food, soil or surfaces contaminated with infected feces.

Symptoms
Symptoms can include watery diarrhea, stomach pain, nausea, vomiting, fever and weight loss.

Transmission
Cryptosporidiosis is spread by swallowing recreational water (e.g. swimming pools) that is contaminated with Crypto. Any untreated water or contaminated, undercooked foods can also aid in the spread of disease.

Treatment
Most people will clear an infection without treatment.

Prevention
Prevention methods include proper hand washing, not ingesting untreated water and drinking only pasteurized milk.
GIARDIASIS

102 cases reported
9 cases per 100,000 population

3% of cases were hospitalized
0 deaths

Overview
Giardiasis is a diarrheal disease caused by the microscopic parasite *Giardia*.  

Symptoms
Symptoms include diarrhea, gas or flatulence, greasy stool, upset stomach, nausea, dehydration and weight loss. Some cases are asymptomatic.

Transmission
Transmission can occur by drinking contaminated water, eating uncooked, contaminated food, contact with someone who is ill, traveling to a country where giardiasis is common and swallowing any item after coming in contact with an infected surface.

Treatment
Antibiotics are an effective form of treatment.

Prevention
Prevention methods include proper hand hygiene, not swimming while ill and avoid drinking untreated water.

EPIEMIOLOGIC REVIEW

- 37% of cases reported a water exposure, which includes natural water sources and pools
- 28% of cases report weight loss
- 6% of cases were co-infected with another enteric disease
- 5% of case were co-infected with HIV
- 20% of cases report foreign travel. The most commonly identified location among cases was Mexico.
- 9% of cases are recent immigrants
- The median duration of illness was 17 days
- No outbreaks were identified
HEPATITIS A

- 103 cases reported
- 9.1 cases per 100,000 population
- 54% of cases were hospitalized
- 3% of cases died from hepatitis A

**Overview**
Hepatitis A is a vaccine-preventable disease of the liver caused by the Hepatitis A virus (HAV). HAV is a self-limiting disease and does not result in a chronic infection.

**Symptoms**
Symptoms can include fatigue, dark urine, low appetite, stomach pain, nausea, vomiting and jaundice. Symptoms typically resolve within 2 months after infection. Most children less than 6 years of age do not experience symptoms.

**Transmission**
Transmission is person-to-person through the fecal-oral route or consumption of contaminated food or water.

**Treatment**
Treatment is supportive care. There are no specific medications to treat hepatitis A.

**Prevention**
The best prevention method against hepatitis A is vaccination.

**EPIDEMIOLOGIC REVIEW**

- Salt Lake County was part of a nationwide outbreak among people experiencing homelessness and people who use illicit drugs
- 40% of cases involved in the outbreak were people experiencing homelessness.
- 65% of cases involved in the outbreak were people who use illicit drugs.
- 98% of all Salt Lake County cases were part of this outbreak
- 72% of cases had jaundice
- 22% of cases were co-infected with hepatitis C. 6% of cases were co-infected with hepatitis B.
- Salt Lake County Health Department made three public notifications about possible hepatitis A exposures due to ill food handlers.

**Hepatitis A by age and sex**

**Hepatitis A by race and ethnicity**

**Hepatitis A monthly frequency and cumulative incidence rate**

**Hepatitis A incidence rates, 2009-18**

**Salt Lake County**
Utah
U.S.
SALMONELLOSIS

cdc.gov/salmonella

- **115** cases reported
- **10.1** cases per 100,000 population

### Symptoms

- **19%** of cases were hospitalized
- **1%** of cases died from *salmonella*

### Transmission

- Transmission occurs by eating or drinking contaminated food or water. *Salmonella* bacteria is also spread by direct contact with an infected person or animal.

### Treatment

- Most cases recover without treatment. However, small children, the elderly and those with severe diarrhea should see a doctor for treatment options.

### Prevention

- Prevention methods include washing hands after contact with animals and before eating, drink only pasteurized milk, avoid untreated water, and cook food to temperature.

### Epidemiologic Review

- Seven outbreaks were identified. The most notable outbreak involved the consumption of kratom. SLCoHD obtained 5 samples of kratom. Four of the five samples tested positive for *salmonella*. Due to the positive results, multiple kratom products were recalled by the FDA.

- The most common serotypes identified among cases include Typhimurium (17%), Enteritidis (10%), and Newport (8%)

- A commonly reported symptom among cases was bloody diarrhea.

- 17% of cases reported foreign travel. Of those cases, Mexico was the most frequently reported location.

- 19% of cases had risky animal exposures, of which 8% of these cases were exposed to reptiles.

- 10% of cases have a history of urinary tract infections.

- 5% of cases were co-infected with another enteric disease.
SHIGA TOXIN-PRODUCING E. COLI

cdc.gov/ecoli

- **49** cases reported
- **4.3** cases per 100,000 population

**Overview**
Shiga-toxin producing *E. coli* (STEC) is an intestinal disease caused by the bacteria *Escherichia coli*. Strains of *E. coli* can produce a toxin that cause serious illness.

**Symptoms**
Common symptoms include bloody diarrhea and can create a condition called hemolytic uremic syndrome. This syndrome can cause kidney failure.

**Transmission**
The disease is spread through the fecal-oral route by the consumption of contaminated food, raw milk, untreated water and other contact with feces of an infected person.

**Treatment**
Treatment is supportive care. Antibiotics should not be used to treat infection.

**Prevention**
Prevention methods include proper hand hygiene after contact with animals and before handling food. Ensure food is cooked at the proper temperature.

**Epidemiologic Review**

- One outbreak was identified. A multistate outbreak of *E. coli* O157:H7 included Salt Lake County residents and was associated with romaine lettuce from Arizona. Water samples taken from a canal used to water the lettuce found that the water was the likely source of contamination.
- 43% of cases reported bloody diarrhea
- 6% of cases developed hemolytic uremic syndrome (HUS)

- The most common serotypes among cases include O26 (14%), O103 (12%), and O157:H7 (10%)
- 27% of cases reported foreign travel during exposure period. Of these cases, 54% of travelers went to Mexico.
- 2% of cases were co-infected with *Salmonella*
- The median duration of illness was 8 days
SHIGELLOSIS

cdc.gov/shigella

- **32** cases reported
- **2.8** cases per 100,000 population

**Overview**
Shigellosis is an infectious disease caused by a group of bacteria called *Shigella*. There are four different species of *Shigella* which include *Shigella sonnei*, *Shigella flexneri*, *Shigella boydii* and *Shigella dysenteriae*.

**Symptoms**
Symptoms commonly include diarrhea, fever and stomach cramps. Some individuals may be asymptomatic.

**Transmission**
The disease is spread person to person via the fecal-oral route. *Shigella* is very contagious and only a small number of bacteria are needed to make someone ill.

**Treatment**
Treatment is supportive care. Antibiotics are not recommended unless the infection is severe. Anti-diarrheal medications are also not recommended.

**Prevention**
Frequent and proper handwashing with soap can help stop the spread of disease.

**EPIDEMIOLOGIC REVIEW**

- Two outbreaks were identified. The first was an outbreak of *Shigella sonnei*. Patients identified were linked due to geographic location and by PFGE pattern. No common exposure was identified. The second outbreak was a multicounty *Shigella sonnei* outbreak among people experiencing homelessness or had close contact with this population.

- **31%** of cases were hospitalized
- **0** deaths

**Shigellosis by age and sex**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Male</th>
<th>Female</th>
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**Percentage**

- **69%** of cases were male
- **31%** of cases were female

**Shigellosis by race and ethnicity**

- **White, non-Hispanic** 16%
- **White, Hispanic** 13%
- **Unknown** 3%
- **Black** 3%

**Shigellosis monthly frequency and cumulative incidence rate**

- **Average frequency**
- **2018 frequency**
- **Average rate**
- **2018 rate**

**Month**
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

**Frequency**

- 0
- 5
- 10

**Rate per 100,000**

- 0
- 5
- 10

**Year**

**Shigellosis incidence rates, 2009-18**

- **Salt Lake County**
- **Utah**
- **U.S.**

- **41%** of cases reported bloody diarrhea
- **3%** of cases were co-infected with giardia
- The most common serotype was *S. sonnei* (34%)
- **9%** of cases reported foreign travel
- The median duration of illness was 6 days
PREVENTION & CONTROL FOR ENTERIC DISEASES

Notable Enteric Outbreaks and Investigations

In September, a norovirus outbreak occurred throughout 30 plus schools, which affected over 700 students. Due to the large scope of the outbreak, epidemiologists and environmental health officers worked together to provide education to parents, staff and school nurses on how to contain the spread of the virus.

A scombroid toxin exposure was identified after an online report of illness was submitted to the Utah Department of Health (UDOH). The exposure occurred at a local restaurant. Environmental health officers and epidemiologists conducted an investigation and identified ground tuna patties as the source of infection. FDA was able to test the tuna and found it positive for the scombroid toxin. Poor food handling practices were identified at the restaurant, which was corrected after this public health intervention.

A local business hosted an event for over 300 employees, which included a catered food truck. Within 10 hours of the event, many customers became ill with severe diarrhea and abdominal pain. A survey was created and sent to all attendees of the event, and resulted in a response rate of 46%. Using a case-control analysis, pork was identified as the likely exposure. Two ill customers tested positive for Clostridium perfringens. Poor food handling practices were identified, and were corrected after public health intervention.

A small cluster of illness was reported in a private pool. The pool was mainly used for swim lessons for infants and children. The illnesses were identified as suspect giardia and cryptosporidiosis. Public health does not regulate private pools, but environmental health officers were able to provide education to the owner on how to maintain the pool to reduce the risk of disease.

Salt Lake County residents were part of a national outbreak of *Vibrio parahaemolyticus*. The source of illness was traced back to the consumption of raw oysters.

Salt Lake County residents were part of a national outbreak of *Salmonella typhi*. The illnesses were identified to be associated with foreign travel.

512 foodborne illness complaints received
98 inspections as a result of foodborne illness complaints
2 facility closures as a result of foodborne illness complaints
6 consumer alerts distributed countywide
**HAEMOPHILUS INFLUENZAE**

cdc.gov/hi-disease

- 25 cases reported
- 2.2 cases per 100,000 population

- 84% of cases were hospitalized
- 16% of cases died from H.flu

**Overview**

*Haemophilus influenzae* (H.flu) is a bacterial pathogen that can result in severe infections, particularly in infants. Syndromes as a result of an H.flu infection include bacteremia (infection in the blood), meningitis or pneumonia.

**Symptoms**

Depending on the syndrome caused as a result of H.flu, symptoms can include fever, chills, nausea, diarrhea, shortness of breath, abdominal pain, chest pain, headache and fatigue.

**Transmission**

H.flu is transmitted person to person by droplets or direct contact with an infected person.

**Treatment**

Antibiotics are the most common form of treatment for all syndromes.

**Prevention**

Vaccine is available for type B (HIB). Routine childhood vaccinations are the best measure to prevent the disease.

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### EPIDEMIOLOGIC REVIEW

- 24% of cases received HIB vaccine
- Serotypes identified among cases: 19 non-typeable, 3 type F, 2 type E and 1 unknown type
- Severity indicators: 20% of cases admitted to ICU, 16% intubated and 12% received vasopressors
- Commonly reported symptoms among cases include shortness of breath, cough, fever and sore throat
- 76% of cases had bacteremia

- Risk factors: 24% of cases smoked, 20% alcohol abuse, 12% illicit drug use and 12% were experiencing homelessness
- 20% of cases had co-infections which included influenza, rhinovirus and *Streptococcus pneumoniae*
- Common comorbidities among cases include cancer, kidney disease, COPD and diabetes
- No outbreaks identified

---

**H. influenzae by age and sex**

- Male
- Female

**H. influenzae by race and ethnicity**

- Native Hawaiian or Pacific Islander
- White, Hispanic
- White, non-Hispanic
- Asian
- Unknown

**H. influenzae monthly frequency and cumulative incidence rate**

- Average frequency
- 2018 frequency
- Average rate
- 2018 rate

**H. influenzae incidence rates, 2009-18**

- Salt Lake County
- Utah
- U.S.
HEPATITIS B, ACUTE

cdc.gov/hepatitis/hbv/index.htm

- 22 cases reported
- 1.9 cases per 100,000 population

Overview
Acute hepatitis B virus (HBV) is a virus that causes liver infection. Some acute HBV infections can develop into chronic HBV infections.

Symptoms
Not all cases have symptoms. Symptoms can include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine and jaundice.

Transmission
HBV is transmitted through activities that involve puncturing the skin or mucous contact with infectious blood or body fluids (e.g. semen, saliva).

Treatment
There is no treatment for acute HBV, only supportive care.

Prevention
Vaccine is the best method for prevention. Other prevention methods include not sharing needles, condoms during sexual intercourse and avoiding sharing personal items, such as razors.

EPIDEMIOLOGIC REVIEW

- Co-infections among cases include hepatitis C (50%), hepatitis A (5%) and invasive streptococcal infection (5%)
- 23% of cases were identified through seroconversion (positive test within a year of negative test)
- 18% of cases report receiving one vaccine and 9% report receiving two vaccines
- Other risk factors include incarceration (5%), high risk sexual behavior (5%) and exposure occurring through dialysis (5%)
- Commonly reported symptoms among cases include loss of appetite, clay colored stool, dark urine, fatigue, abdominal pain, jaundice and nausea
- 59% of cases reported injection drug use (heroin and methamphetamines)
- 59% of cases were hospitalized
- 0 deaths

Acute hepatitis B by race and ethnicity

Acute hepatitis B monthly frequency and cumulative incidence rate

Acute hepatitis B incidence rates, 2009-18

Salt Lake County
Utah
U.S.
**PERTUSSIS**

cdc.gov/pertussis

- 164 cases reported
- 14.4 cases per 100,000 population
- 4% of cases were hospitalized
- 0 deaths

**Overview**
Pertussis, also known as whooping cough, is a respiratory illness caused by the bacteria *Bordetella pertussis*.

**Symptoms**
Symptoms typically include cough, runny nose, fever, apnea, paroxysms and post-tussive vomiting.

**Transmission**
Pertussis is transmitted from person to person by coughing, sneezing or being in close contact with an infected person.

**Treatment**
Antibiotics are the preferred form of treatment.

**Prevention**
Vaccination is the best measure to prevent disease. Ensuring vaccines are up to date provides that greatest amount of protection.

---

**EPIDEMIOLOGIC REVIEW**

- Six outbreaks were identified. The largest outbreak occurred at a high school and infected 23 students across all grades. The school had a 5% exemption rate.
- 95% of cases were treated
- 433 contacts to cases were treated
- Risk factors for infection among cases were immunocompromised status and not being up to date on vaccination
- Commonly reported symptoms among cases include paroxysms of cough, post-tussive vomiting and apnea
- 84% of cases were vaccinated. Of those cases, 67% were up to date. 13% had never received a pertussis vaccine.
- 2% of cases had contact with a symptomatic individual outside of the state or country

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**Pertussis by age and sex**

- Percentage
- Age group, years

**Pertussis by race and ethnicity**

- American Indian or Alaska Native
- Asian
- White, Hispanic
- Native Hawaiian or Pacific Islander
- Hispanic, unknown
- White, non-Hispanic
- Unknown

**Pertussis monthly frequency and cumulative incidence rate**

- Average frequency
- 2018 frequency
- Average rate
- 2018 rate

**Pertussis incidence rates, 2009-18**

- Salt Lake County
- Utah
- U.S.
VARICELLA (CHICKENPOX)

cdc.gov/varicella

- 79 cases reported
- 7 cases per 100,000 population
- 1% of cases were hospitalized
- 0 deaths

EPIDEMIOLOGIC REVIEW

- One outbreak was identified. The outbreak occurred in a school with multiple grades affected. Twelve students were infected.
- Commonly reported symptoms among cases include fever, fatigue and rash
- Three cases reported exposure to individuals who were recently diagnosed with shingles
- Most cases reported having lesions, with 47% of cases reporting 50-249 lesions
- 54% of cases were not vaccinated. Reasons for not vaccinating include patient/parent refusal and the case was outside the recommended age for vaccine.
- 39% of cases report being vaccinated. Of those cases, 52% had two doses of vaccine, 42% had one dose and 19% were behind schedule.
- One case delivered a baby during her illness. The newborn received VARIZIG at birth with no report of illness.

Overview
Chickenpox is a highly contagious disease caused by the varicella-zoster virus (VZV).

Symptoms
Symptoms typically include an itchy, blister-like rash that eventually scabs. The rash appears on the chest, back and face first before spreading to the entire body. Other symptoms can include fever, fatigue, loss of appetite and headache.

Transmission
Transmission occurs through close contact to an infected individual. A patient is infectious 1 to 2 days prior to rash and until the lesions have crusted (scabbed). Minimize scratching to help reduce the spread.

Treatment
Treatment is supportive to help alleviate symptoms. Home remedies such as calamine lotion and oatmeal baths can soothe the itch.

Prevention
The best prevention method against chickenpox is vaccination.
GROUP A STREPTOCOCCUS

cdc.gov/groupastrep

- 138 cases reported
- 12.2 cases per 100,000 population

98% of cases were hospitalized
14% of cases died from GAS

Invasive group A streptococcus by age and sex

Invasive group A streptococcus by race and ethnicity

Invasive group A streptococcus monthly frequency and cumulative incidence rate

Invasive group A streptococcus incidence rates, 2009-18

EPIEMIOLOGIC REVIEW

- Severity indicators: 11% of cases admitted to ICU, 4% intubated and 4% received vasopressors
- Commonly reported symptoms among cases include fever and swelling of an extremity
- 9% of cases were co-infected with hepatitis C. Other co-infections among cases include influenza, rhinovirus and coronavirus.
- 17% of cases developed toxic shock from their GAS infection

- Risk factors: 14% of cases report injection drug use, 23% smoked and 17% were experiencing homelessness
- 16% of cases reported blunt or penetrating trauma prior to symptom onset. Of these cases, 32% reported a fall.
- Common comorbidities among cases include diabetes, heart disease, cancer and obesity
- No outbreaks identified

Overview
Group A streptococcus (GAS) is a bacterial infection caused by the bacterium Streptococcus pyogenes. The bacteria are usually found in the blood, CSF or body fluids.

Symptoms
Symptoms can vary but common types of invasive disease include bacteremia (infection in the blood), cellulitis, pneumonia and meningitis.

Transmission
Transmission occurs person-to-person through respiratory droplets and direct contact with infected secretions.

Treatment
GAS is a serious disease that requires treatment with antibiotics as soon as possible.

Prevention
There are no specific recommendations for prevention. Practicing good hygiene and not sharing needles are beneficial practices to help avoid the spread of disease.
GROUP B STREPTOCOCCUS

Overview
Group B streptococcus (GBS) is a bacterial disease caused by the bacterium Streptococcus agalactiae. GBS is a major cause of perinatal bacterial infections in both pregnant women and infants.

Symptoms
Common symptoms among infants include respiratory stress and shock. Pregnant women can experience womb infections and still birth.

Transmission
Transmission occurs person-to-person. Transmission from mother to infant occurs during delivery.

Treatment
Treatment with antibiotics is recommended as soon as possible.

Prevention
Prevention methods include prenatal screenings for all pregnant women. Colonized pregnant women should receive antibiotics once their membrane ruptures.

Invasive group B streptococcus by age and sex
- 88% of cases were hospitalized
- 8% of cases died from GBS

Invasive group B streptococcus by race and ethnicity
- 88% of cases were hospitalized
- 8% of cases died from GBS

Invasive group B streptococcus monthly frequency and cumulative incidence rate
- 88% of cases were hospitalized
- 8% of cases died from GBS

Invasive group B streptococcus incidence rates, 2009-18
- 88% of cases were hospitalized
- 8% of cases died from GBS

EPIDEMIOLOGIC REVIEW
- Commonly reported symptoms among cases include fever/chills, nausea, vomiting, abdominal pain and muscle aches
- Risk factors: 17% of cases smoked and 10% had illicit drug use
- 11% of cases reported infected foot ulcers
- Severity indicators: 5% of cases admitted to ICU, 2% intubated
- Common comorbidities among cases include diabetes, heart disease, pulmonary disease and morbid obesity
- Six infected infants had mothers who were screened for GBS. Of those six, three mothers were screened at 35-37 weeks.
- One infant died with bacteremia
- 50% of GBS positive infants were delivered vaginally
- Two GBS positive women gave birth to infants that were not infected
- 7 out of 10 infants received antibiotics at birth
- No outbreaks identified

98 cases reported
8.6 cases per 100,000 population
STREPTOCOCCUS PNEUMONIAE

**Overview**

*Streptococcus pneumoniae* (SPD) is an invasive, bacterial infection and is the most common cause of bacterial pneumonia in the U.S.

**Symptoms**

Symptoms typically include an abrupt onset of fever, chills, chest pain, cough, difficulty breathing and weakness.

**Transmission**

Transmission occurs person-to-person through contact with respiratory droplets and secretions.

**Treatment**

Appropriate treatment is with antibiotics, however antibiotic resistance is increasing. Antibiotic susceptibility testing is encouraged to identify the correct antibiotic for successful treatment.

**Prevention**

The best prevention method is vaccination.

---

**EPIDEMIOLOGIC REVIEW**

- Commonly reported symptoms among cases include cough, fever, shortness of breath and chest pain
- Co-infections among cases include hepatitis C, influenza, parainfluenza, hepatitis B and HIV
- Severity indicators: 17% of cases admitted to ICU, 7% intubated and 5% received vasopressors
- No outbreaks identified

- Risk factors: 48% of cases reported smoking, alcohol abuse and/or injection drug use
- Common comorbidities among cases include heart disease, lung disease, diabetes and morbid obesity
- 28% of cases report receiving the PCV-7 vaccine
- 25% of cases report receiving the PCV-23 vaccine. Of those cases, 62% received the PCV-23 vaccine before the age of 65.

---

**CDC.gov/pneumococcal**

- 116 cases reported
- 10.2 cases per 100,000 population

**Streptococcus pneumoniae by age and sex**

- Age group, years: 85+, 75-84, 65-74, 55-64, 45-54, 35-44, 25-34, 15-24, 5-14, <5
- Percentage: 20%, 10%, 0%, 10%, 20%

**Streptococcus pneumoniae by race and ethnicity**

- American Indian or Alaska Native: 66%
- Asian: 6%
- Black: 4%
- Native Hawaiian or Pacific Islander: 2%
- White, Hispanic: 5%
- White, non-Hispanic: 2%
- Hispanic, unknown: 9%
- Unknown: 2%

**Streptococcus pneumoniae monthly frequency and cumulative incidence rate**

- Frequency: 0, 5, 10, 15
- Rate per 100,000: 0, 5, 10, 15
- Month: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

**Streptococcus pneumoniae incidence rates, 2010-18**

- Rate per 100,000: 0, 5, 10, 15

- Salt Lake County, Utah, U.S.
STREPTOCOCCAL TOXIC SHOCK

cdc.gov/groupastrep

- **23** cases reported
- **2** cases per 100,000 population
- **100%** of cases were hospitalized
- **39%** of cases died from STSS

### Overview

Streptococcal toxic shock syndrome (STSS) is a serious complication from a Group A streptococcus infection.

### Symptoms

Common symptoms include fever, diarrhea, muscle aches, hypotension and multi-system organ involvement.

### Transmission

Group A streptococci is transferred person-to-person through respiratory droplets and direct contact with infected secretions. STSS itself is not communicable person-to-person but the organism that causes it (GAS) is.

### Treatment

Treatment includes antibiotics, supportive care and severe infections may require surgical debridement.

### Prevention

There are no specific prevention recommendations for STSS.

---

**EPIDEMIOLOGIC REVIEW**

- Severity indicators: 30% of cases admitted to ICU, 17% intubated and 22% received vasopressors
- Commonly reported symptoms among cases include diarrhea, fever and muscle pain
- The most common co-infection was hepatitis C (13%). Other co-infections include rhinovirus, coronavirus, influenza and shiga-toxin producing *E.coli.*
- No outbreaks identified

- Risk factors: 30% of cases smoked and 17% of cases were experiencing homelessness
- Common comorbidities among cases include diabetes and heart disease
- Complications among cases from STSS include acute respiratory distress syndrome (26%), necrosis (22%) and disseminated intravascular coagulation (22%)
CHLAMYDIA

cdc.gov/std/chlamydia

- 5,279 cases reported
- 464.8 cases per 100,000 population

- 0 cases were hospitalized
- 0 deaths

Chlamydia by age and sex

Chlamydia by race and ethnicity

Chlamydia monthly frequency and cumulative incidence rate

Chlamydia incidence rates, 2010-18

EPIDEMIOLGIC REVIEW

- Age is the biggest risk factor for a chlamydia infection. Over 85% of all infection occurred in the 15-34 year old age group among men and women.

- The most common co-infection was gonorrhea
- Chlamydia is the most commonly reported disease in Salt Lake County, Utah and the United States

Overview
Chlamydia is a bacterial infection caused by the bacteria *Chlamydia trachomatis*.

Symptoms
Almost 75% of infections are asymptomatic. Symptoms can include vaginal or urethral discharge, frequent urination, painful urination, lower abdominal pain and lymphadenopathy. Frequent and/or prolonged infection can result in infertility.

Transmission
Transmission occurs during vaginal, oral or rectal sex with an infected partner through contact with infected body fluids.

Treatment
Antibiotics are the preferred form of treatment.

Prevention
Use of condoms, reducing the number of sexual partners and increased routine screening can help prevent the spread of disease.
GONORRHEA

Overview
Gonorrhea is a bacterial infection caused by the bacteria Neisseria gonorrhoeae.

Symptoms
Symptoms can include unusual genital or rectal discharge, painful urination, frequent urination and pain during intercourse. Serious complications can include disseminated infection, pelvic inflammatory disease or prostatitis.

Transmission
Transmission occurs during vaginal, oral or rectal sex with an infected partner through contact with infected body fluids.

Treatment
A dual therapy approach with antibiotics is the preferred method of treatment.

Prevention
Use of condoms, reducing the number of sexual partners and increased routine screening can help prevent the spread of disease.

EPIDEMIOLOGIC REVIEW

- Men were disproportionately infected with gonorrhea
- Risk factors for infection among cases include men who have sex with men, homelessness, substance abuse and incarceration
- Case counts have been increasing for eight consecutive years, with 2018 having the highest rate of infection

- Commonly reported symptoms among cases include unusual genital discharge, painful urination, balanitis, swollen lymph nodes, prostatitis and pelvic inflammatory disease
- Roughly 50% of cases had asymptomatic infections
- The most common co-infection was chlamydia. Co-infection with syphilis was seen among cases as well.

- 1,913 cases reported
- 168.4 cases per 100,000 population
- 0 cases were hospitalized
- 0 deaths

Gonorrhea by age and sex

Gonorrhea by race and ethnicity

Gonorrhea monthly frequency and cumulative incidence rate

Gonorrhea incidence rates, 2010-18

Salt Lake County Utah U.S.
HIV, NEW

cdc.gov/hiv

- 79 cases reported
- 7 cases per 100,000 population
- 9% of cases were hospitalized
- 1% of cases died from HIV

**Overview**

Human immunodeficiency virus (HIV) is a retrovirus that affects the immunity of those infected.

**Symptoms**

Symptoms of acute illness can include fever, chills, rash, night sweats, fatigue, swollen lymph nodes and mouth ulcers.

**Transmission**

Transmission occurs most commonly through vaginal or rectal sex. Infection can also occur with injection drug use and sharing needles.

**Treatment**

There is no cure for HIV, yet early and consistent treatment with antiretrovirals have shown to be successful in managing the disease.

**Prevention**

Use of condoms, reducing the number of sexual partners, not sharing needles and increased routine screening can help prevent the spread of disease. Taking pre-exposure prophylaxis is recommended for high risk individuals.

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**EPIDEMIOLOGIC REVIEW**

- Risk factors for infection among cases include men who have sex with men or men who have sex with other men who use injection drugs
- Commonly reported symptoms among cases include flu-like illness, full body rash and pneumocystis pneumonia
- At the time of diagnosis, about 10% of cases also presented with opportunistic infections, such as pneumonia and thrush
- Co-infections among cases include syphilis, chlamydia, gonorrhea, human papilloma virus and genital herpes
- Approximately 20% of cases had a syphilis infection within the previous twelve months of their HIV infection
- HIV case counts have remained stable for the past three years
**SYphilis**
(PRIMARY, SECONDARY, EARLY LATENT)

cdc.gov/std/syphilis

- **131** cases reported
- **14.2** cases per 100,000 population
- **2%** of cases were hospitalized
- **0** deaths

**Syphilis by age and sex**

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**Syphilis by and ethnicity**

- Asian
- American Indian or Alaska Native
- Black
- Native Hawaiian or Pacific Islander
- White, Hispanic
- White, non-Hispanic

**Syphilis monthly frequency and cumulative incidence rate**

- Average frequency
- 2018 frequency
- Average rate
- 2018 rate

**Syphilis incidence rates, 2010-18**

- Salt Lake County
- Utah
- U.S.

**Epidemiologic Review**

- Risk factors among cases include men who have sex with men or females with male partners who also have sex with men
- 32% of cases were co-infected with HIV. Cases were also co-infected gonorrhea.
- Five cases of early stage syphilis developed neurological symptoms that impaired their vision and hearing
- Symptoms among primary and secondary syphilis cases include body rash, oral and/or genital chancres, wart-like lesions on the genitals, alopecia, inguinal lymphadenopathy and flu-like illness

**Overview**

Syphilis is a bacterial infection caused by the bacterium *Treponema pallidum*. The disease is comprised of several stages depending on the length of infection. It is highly pathogenic when exposure occurs at the earliest stage of disease.

**Symptoms**

The most common symptoms are painless lesions or chancres at the exposure site. Other symptoms can include a full body rash or rash on the soles of the feet and palms of the hands.

**Transmission**

The disease is spread through sexual contact, usually with a partner that has a syphilitic chancre.

**Treatment**

Antibiotics are the preferred form of treatment.

**Prevention**

Use of condoms, reducing the number of sexual partners and getting tested every 3-6 month for high risk populations can help prevent the spread of disease.
PREVENTION & CONTROL FOR SEXUALLY TRANSMITTED DISEASES

**Chlamydia**
- 2,760 contacts assessed
- 1,453 contacts were not infected
- 394 infected contacts received treatment
- 1,366 contacts received treatment
- 394 infected contacts received treatment
- 1,453 contacts were not infected

**Gonorrhea**
- 509 contacts assessed
- 142 contacts were not infected
- 262 infected contacts received treatment
- 142 contacts were not infected

**HIV, new**
- 201 contacts assessed
- 69 contacts were not infected
- 27 testing events
- 448 individuals tested
- 75 contacts received testing
- 42 contacts were previously diagnosed with HIV
- 239 contacts assessed
- 114 contacts were not infected
- Syphilis: primary, secondary & early latent
- 113 contacts received treatment
- 27 infected contacts received treatment
ACINETOBACTER (CARBAPENEM RESISTANT)

cdc.gov/HAI/organisms/acinetobacter.html

- 34 cases reported
- 3 cases per 100,000 population
- 59% of cases were hospitalized
- 41% of cases died from Acinetobacter

Acinetobacter by age and sex

<table>
<thead>
<tr>
<th>Age group, years</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>&lt;5</td>
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<tr>
<td>85+</td>
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</tbody>
</table>

Acinetobacter by race and ethnicity

- 38% White, non-Hispanic
- 62% Unknown

Acinetobacter monthly frequency and cumulative incidence rate

- Risk factors include cases with non-healing wounds (47%), obesity (21%) and having a tracheostomy (21%)
- 97% of cases were Acinetobacter baumannii
- 15% of cases were co-infected with pseudomonas aeruginosa. Other co-infections include Clostridium difficile, hepatitis C and group A streptococcus.

Acinetobacter incidence rates, 2013-18

- 26% of patients were carbapenemase producers
- 97% of cases were resistant to meropenem
- 20% of cases were carbapenem-resistant

EPIDEMIOLOGIC REVIEW

- Two outbreaks were identified. One outbreak occurred in a long-term care facility with a highly resistant Acinetobacter. The second outbreak occurred in a burn unit. Two of the four cases died from their infection and complications from their injuries.
- Risk factors include cases with non-healing wounds (47%), obesity (21%) and having a tracheostomy (21%)
- 97% of cases were Acinetobacter baumannii
- 15% of cases were co-infected with pseudomonas aeruginosa. Other co-infections include Clostridium difficile, hepatitis C and group A streptococcus.

Overview
Carbapenem-resistant Acinetobacter is a bacterium that is resistant to one or more carbapenem antibiotics.

Symptoms
Symptoms vary depending on the type of disease and some people may be asymptomatic.

Transmission
The pathogen is transmitted person to person or contact with a contaminated surface or medical equipment.

Treatment
Treatment varies with each isolate. Some cases may be susceptible to a small number of antibiotics while others are pan-resistant, meaning no treatment is available.

Prevention
Proper hand hygiene, use of personal protective equipment and environmental cleaning practices help reduce the spread of disease. Practicing antibiotic stewardship could help in reducing antibiotic resistance.
E. COLI (CARBAPENEM RESISTANT)
cdc.gov/hai/organisms/cre/index.html

- **10** cases reported
- **1** case per 100,000 population
- **50%** of cases were hospitalized
- **10%** of cases died from *E. coli*

**Symptoms**
Symptoms vary depending on the type of disease and some people may be asymptomatic.

**Transmission**
Person to person contact of infected stool or wounds. Contaminated medical equipment can also transmit disease.

**Treatment**
Treatment varies with each isolate. Some cases may be susceptible to a small number of antibiotics while others are pan-resistant, meaning no treatment is available.

**Prevention**
Proper hand hygiene, use of personal protective equipment and environmental cleaning practices help reduce the spread of disease. Practicing antibiotic stewardship could help in reducing antibiotic resistance.

**EPIDEMIOLOGIC REVIEW**
- Urinary tract symptoms were most commonly reported among cases: burning with urination, frequency, urgency and flank pain
- 90% of isolates came from urine cultures
- Three cases were carbapenemase producers with 1 KPC and 2 NDM. Both NDM cases moved to the United States within the year.
- No outbreaks identified
- Risk factors for infection among cases include frequent urinary tract infections, immunosuppressive therapy and obesity
- 10% of cases were co-infected with hepatitis B and 10% were co-infected with hepatitis C
- 60% of isolates were resistant to ertapenem, 40% resistant to imipenem and 40% resistant to meropenem
ENTEROBOACTER
(CARBAPENEM RESISTANT)

cdc.gov/hai/organisms/cre/index.html

- 24 cases reported
- 2.1 cases per 100,000 population
- 42% of cases were hospitalized
- 21% of cases died from Enterobacter
- 75% of isolates were Enterobacter cloacae, 28% were Enterobacter aerogenes
- Co-infections include Clostridium difficile and hepatitis C
- 75% of isolates were resistant to ertapenem, 25% resistant to imipenem and 17% resistant to meropenem
- No carbapenemase producers were identified
- 33% of cases were seen outpatient
- Urinary tract symptoms were most commonly reported among cases: burning with urination, frequency, urgency and flank pain
- 58% of isolates came from urine cultures
- Risk factors among cases include urological issues (25%), non-healing wounds (25%) and immunosuppressive therapy (21%)
- No outbreaks were identified

Overview
Carbapenem-resistant Enterobacter is a bacterium that is resistant to one or more carbapenem antibiotics.

Symptoms
Symptoms vary depending on the type of disease and some people may be asymptomatic.

Transmission
Person to person contact of infected stool or wounds. Contaminated medical equipment can also transmit disease.

Treatment
Treatment varies with each isolate. Some cases may be susceptible to a small number of antibiotics while others are pan-resistant, meaning no treatment is available.

Prevention
Proper hand hygiene, use of personal protective equipment and environmental cleaning practices help reduce the spread of disease. Practicing antibiotic stewardship could help in reducing antibiotic resistance.
KLEBSIELLA (CARBAPENEM RESISTANT)

cdc.gov/hai/organisms/cre/index.html

- 11 cases reported
- 1 case per 100,000 population

Overview
Carbapenem-resistant Klebsiella is a bacterium found in the gastrointestinal tract that is resistant to one or more carbapenem antibiotics.

Symptoms
Symptoms vary depending on the type of disease and some people may be asymptomatic.

Transmission
Person-to-person contact by infected healthcare personnel or by contaminated medical equipment.

Treatment
Treatment varies with each isolate. Some cases may be susceptible to a small number of antibiotics while others are pan-resistant, meaning no treatment is available.

Prevention
Proper hand hygiene, use of personal protective equipment and environmental cleaning practices help reduce the spread of disease. Practicing antibiotic stewardship could help in reducing antibiotic resistance.

EPIDEMIOLOGIC REVIEW

- Urinary tract symptoms were most commonly reported among cases: burning with urination, frequency and urgency
- 82% of isolates came from urine cultures
- Risk factors among cases include urological issues (36%) and surgical complications (9%)
- No outbreaks identified
- 55% of cases were seen outpatient
- Common comorbidities among cases include diabetes, cancer and liver disease
- 55% of cases were resistant to ertapenem, 36% of cases were resistant to meropenem and 27% of cases were resistant to imipenem
- 73% of isolates were Klebsiella pneumoniae and 27% of isolates were Klebsiella aerogenes
- One case was a carbapenemase producer
- 9% of cases were co-infected with hepatitis C

Klebsiella by age and sex

Klebsiella by race and ethnicity

Klebsiella monthly frequency and cumulative incidence rate

Klebsiella incidence rates, 2013-18

Salt Lake County
Utah
COCCIDIOIDOMYCOSIS

Coccidioidomycosis, also known as Valley Fever, is an infection caused by the Coccidioides fungus. This fungus is found in the soil, mainly in the southwestern United States.

**Symptoms**
Common symptoms include chest pain, cough, headache, fever, muscle pain, joint pain and rash.

**Transmission**
Coccidioides spores are transmitted through dust-producing activities in areas where soil is contaminated. Exposure occurs when the spores are inhaled. The disease is not spread person-to-person.

**Treatment**
Treatment consists of oral antifungals, but mild cases can resolve without treatment.

**Prevention**
If you live in an endemic area, decrease the amount of dust in your environment. This will not eliminate the Coccidioides spores, but it can reduce the transmission.

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**EPIDEMIOLOGIC REVIEW**

- 12 cases reported
- 1.1 cases per 100,000 population
- 50% of cases were hospitalized
- 8% of cases died from coccidioidomycosis

**Coccidioidomycosis by age and sex**

<table>
<thead>
<tr>
<th>Age group, years</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
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<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>85+</td>
<td>10%</td>
<td>12%</td>
</tr>
</tbody>
</table>

**Coccidioidomycosis by race and ethnicity**

- American Indian or Alaska Native: 17%
- White, Hispanic: 25%
- White, non-Hispanic: 50%
- Unknown: 8%

**Coccidioidomycosis by age and sex**

- Common comorbidities among cases include heart disease, lung disease and diabetes
- 25% of cases had lung nodules discovered while being evaluated for the disease
- 8% of cases were immigrants to the United States
- 17% of cases had a prior history of infection
- 67% of cases had their infection typed as Coccidioides immitis

---

**Coccidioidomycosis monthly frequency and cumulative incidence rate**

- Travel to endemic states: cases reported travel to California, Nevada, Arizona, Washington and Mexico
- Commonly reported symptoms among cases include chest pain, cough, sore throat, fatigue, headache and weight loss
- 8% of cases were construction workers. No other outdoor exposures were identified
- No outbreaks identified
HEPATITIS C, ACUTE

cdc.gov/hepatitis/hcv

- 88 cases reported
- 7.7 cases per 100,000 population

**Acute hepatitis C by age and sex**

**Acute hepatitis C by race and ethnicity**

- 23% of cases were hospitalized
- 0 deaths

**Overview**
Acute hepatitis C (HCV) is a virus that causes liver infection. Around 15-30% of acute HCV cases will develop into chronic HCV.

**Symptoms**
Most people (70-80%) will have no symptoms. Symptoms may consist of fatigue, abdominal pain, poor appetite, jaundice, fever, dark urine, clay-colored stools, nausea and vomiting.

**Transmission**
HCV is transmitted through activities that involve puncturing the skin or mucous contact with infectious blood or body fluids (e.g. semen, saliva).

**Treatment**
There is no treatment for acute HCV, only supportive care.

**Prevention**
Prevention methods include ensuring equipment entering the body is sterile (e.g. needles, tattooing devices). Using condoms during intercourse is also recommended.

**EPIDEMIOLOGIC REVIEW**

- Risk factors: 34% of cases were recently incarcerated, 57% report injection drug use, 31% were experiencing homelessness, 9% high risk sexual behaviors
- Commonly reported symptoms among cases include fatigue, abdominal pain, jaundice and nausea
- Co-infections among cases include hepatitis A, hepatitis B, gonorrhea, HIV, chlamydia, syphilis and invasive streptococcal infection
- 30% of cases were identified through seroconversion (a positive test within a year of a negative test)
- 26% of cases were tested to specify the genotype of their HCV infection. Of those tested, 9% were type 1a, 8% were 1undifferentiated, 7% 3a, 2% 2b and 1% 1b
- 13% of infected females were pregnant
- 5% of cases contracted HCV from an infected donor transplant
- No outbreaks identified
LEGIONELLOSIS

cdc.gov/legionella

- 17 cases reported
- 1.5 cases per 100,000 population

LEGIONELLOSIS by age and sex

LEGIONELLOSIS by race and ethnicity

LEGIONELLOSIS monthly frequency and cumulative incidence rate

LEGIONELLOSIS incidence rates, 2009-18

LEGIONELLOSIS:

Overview
Legionellosis is a respiratory disease caused by Legionella bacteria. It can cause a serious type of pneumonia called Legionnaire’s disease or the less severe illness Pontiac fever.

Symptoms
Common symptoms include cough, shortness of breath, fever, muscle aches, headaches, diarrhea, and confusion.

Transmission
Legionella bacteria is found in freshwater environments (e.g. lakes, streams). It is also found in man-made water systems. Transmission occurs when one inhales a small droplet of water contaminated with the bacteria.

Treatment
Antibiotics are the appropriate treatment option.

Prevention
Prevention measures include minimizing growth of the bacteria within man-made water systems. This includes implementing and maintaining effective water management plans.

EPIDEMIOLOGIC REVIEW

- Risk factors among cases include age (94% of cases were 50 years of age or older), smoking (53%) and alcohol abuse (59%)
- Water exposures among cases include showers (82%), hot tub/pool (29%), municipal water (100%), natural water sources (35%)
- 18% of cases were nosocomial, 24% were possibly nosocomial, 29% of cases acquired infection while traveling and 41% of cases were community acquired
- One outbreak was identified. Outbreak occurred in a healthcare facility with 3 infected cases. As a result of public health intervention, the facility now has a long-term water management plan in place.
- Commonly reported symptoms among cases include fever, cough, shortness of breath, diarrhea and confusion
- 80% of cases with travel history report a hotel stay
LYME DISEASE

cdc.gov/lyme/index.html

- **15** cases reported
- **1.3** cases per 100,000 population

- **7%** of cases were hospitalized
- **0** deaths

**Overview**
Lyme disease is caused by the bacteria *Borrelia burgdorferi*.

**Symptoms**
Symptoms can start with a circular red rash (erythema migrans) at or near the tick bite site. Other symptoms may include fever, headache, fatigue, stiff neck, muscle and joint pain, lymph node swelling and facial paralysis.

**Transmission**
Transmission occurs when an individual is bitten by an infected tick.

**Treatment**
Recommended treatment is with antibiotics for 2-3 weeks. IV medication may be required for more serious cases.

**Prevention**
Prevention methods include awareness of tick exposure while outdoors. Remove tick immediately if detected, check for ticks after outdoor exposures, wear protective clothing, use insect repellent containing DEET and avoid overhanging grass or brush.

**EPIDEMIOLOGIC REVIEW**

- 67% of cases traveled to a state that is endemic for Lyme disease, 13% of cases traveled outside of the country
- 27% of cases report being bit by a tick
- No outbreaks were identified
- 47% of cases were treated with doxycycline, where 40% were treated with a combination of antibiotics

- Commonly reported symptoms among cases include fever, arthralgia, fatigue, stiff neck, erythema migrans, facial palsy and joint swelling
- 13% of cases reported an erythema migrans rash
- No cases found to have acquired the disease within Utah
Meningitis, Aseptic

cdc.gov/meningitis/viral.html

- 47 cases reported
- 4.1 cases per 100,000 population

Aseptic meningitis by age and sex

Aseptic meningitis by race and ethnicity

Aseptic meningitis monthly frequency and cumulative incidence rate

Aseptic meningitis incidence rates, 2009-18

Overview
Aseptic meningitis is a serious disease caused by inflammation of the membranes of the brain and spinal cord. A case is classified as aseptic when a bacterial or viral pathogen is not identified as the cause of illness.

Symptoms
Common symptoms include fever, stiff neck, headache, nausea, vomiting and rash.

Transmission
Meningitis is transferred person-to-person.

Treatment
Treatment is typically supportive, meaning rest, hydration and anti-inflammatory medications.

Prevention
There are no specific prevention measures. Practicing good hand hygiene could help reduce the spread of illness.

Epidemiologic Review

- Risk factors among cases include substance abuse and lowered immune system due to immunosuppressive therapy
- Commonly reported symptoms among cases include headache, fever, stiff neck, altered mental status, muscle aches and nausea/vomiting
- No outbreaks identified

- Common comorbidities among cases include obesity, history of migraines, asthma and metabolic conditions such as diabetes and hypothyroidism
- 91% of cases were diagnosed with meningitis and 13% were diagnosed with encephalitis
- Low severity outcomes among cases

▪ 89% of cases were hospitalized
▪ 4% of cases died from aseptic meningitis

- 2% cases were hospitalized
- 2% died from aseptic meningitis
- 47 cases reported
- 4.1 cases per 100,000 population

Aseptic meningitis by race and ethnicity

- Black 21%
- Native Hawaiian or Pacific Islander 1%
- White, non-Hispanic 64%
- White, Hispanic 4%
- Hispanic, unknown 4%
- Unknown 2%

Aseptic meningitis by age and sex

- 85+ 20%
- 75-84 10%
- 65-74 5%
- 55-64 5%
- 54-55 5%
- 45-54 5%
- 35-44 5%
- 25-34 5%
- 15-24 5%
- 5-14 5%
- <5 5%

Aseptic meningitis monthly frequency and cumulative incidence rate

Aseptic meningitis incidence rates, 2009-18

- Salt Lake County
- Utah

EPIDEMIOLOGIC REVIEW
MENINGITIS, BACTERIAL

cdc.gov/meningitis/bacterial.html

- **23 cases reported**
- **2 cases per 100,000 population**

**Overview**
Bacterial meningitis is a serious disease caused by inflammation of the membranes of the brain and spinal cord due to a bacterial pathogen.

**Symptoms**
Symptoms often include an abrupt onset of fever, stiff neck, headache, altered mental status and photophobia (extreme sensitivity to light).

**Transmission**
Bacterial meningitis is not spread person-to-person. Many people are colonized with bacteria. A traumatic event to the head or invasive procedure like brain surgery can allow for the bacteria to cause infection.

**Treatment**
Treat with antibiotics as soon as possible. The type of antibiotic given will depend on the pathogen and severity of illness.

**Prevention**
There are no specific prevention measures. Good hygiene can help contain the spread of the bacteria.

**Epidemiologic Review**

- 30% of cases had a history of a brain tumor. Other comorbidities among cases include diabetes, smoking and seizures.
- Severity indicators: 17% of cases admitted to the ICU, 13% intubated
- 13% of cases had a shunt placed after brain surgery and prior to disease onset
- Commonly reported symptoms among cases include headache, fever and altered mental status
- 26% of cases were positive for *staphylococcus aureus*, with one case identified with MRSA
- No outbreaks identified
MENINGITIS, VIRAL

[cdc.gov/meningitis/viral.html]

- **43** cases reported
- **3.8** cases per 100,000 population

**95%** of cases were hospitalized

- **0** deaths

**EPIDEMIOLOGIC REVIEW**

- **51%** of cases were positive for enterovirus, **30%** herpes simplex virus, **16%** varicella, **5%** Epstein Barr virus and **2%** adenovirus
- Commonly reported symptoms among cases include fever, headache, stiff neck, altered mental status, vomiting and photophobia
- No outbreaks identified

- **Risk factors:** **30%** of cases report a sick contact with similar symptoms. Other risk factors include smoking, alcohol abuse, illicit drug use and use of immunosuppressive therapies
- **Common comorbidities among cases include diabetes, migraines and obesity**
- **88%** of cases were diagnosed with meningitis, **19%** encephalitis and **7%** meningoencephalitis

**Overview**

Viral meningitis is a serious disease caused by inflammation of the membranes of the brain and spinal cord due to a viral pathogen.

**Symptoms**

Common symptoms include fever, stiff neck, headache, nausea, vomiting and rash.

**Transmission**

Transmission occurs person-to-person through the fecal-oral route, respiratory droplets or direct contact.

**Treatment**

Treatment is typically supportive, meaning rest, hydration and anti-inflammatory medications.

**Prevention**

Prevention includes practicing good hand hygiene to avoid passing viruses through the fecal-oral route. Wash hands thoroughly with soap and water after changing diapers, when ill with diarrhea or caring for those ill with diarrhea.
DATA NOTES

Summarized diseases include reportable conditions with a 2018 count ≥ 10. Diseases with a 2018 count < 10 are not included and influenza data are summarized in a separate report. Analysis included data based on date reported to public health (1/1/18-12/31/18) and case status (Table 1). Outbreak data are only provided for diseases where outbreaks were identified (Table 1). Rates were calculated per 100,000 population. Population denominators were obtained from the Utah Indicator-Based Information System (IBIS). U.S. incidence rates are not available for diseases that are not nationally notifiable or whose data are otherwise unavailable. Race and ethnicity data may not sum exactly to 100% due to rounding error. Age and sex data may not sum exactly to 100% due to the exclusion of unknown data.

Table 1. Reportable disease case statuses and outbreak definitions used in data analysis.

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<tr>
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<td>Syphilis (primary, secondary, early latent)</td>
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<td>Multi-drug Resistant Organisms</td>
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*Outbreak definition is only provided for diseases where outbreaks were identified.
† ≥ 2 related cases
§ ≥ 2 related cases in 21 days
‡ 1 case