North Dakota Epidemiology Report

2015

The Division of Disease Control:

- Conducts a general communicable disease program and provides epidemiology for reportable diseases; programs administered include: Immunization, HIV/STD/TB/Viral Hepatitis, and Epidemiology and Surveillance
- Identifies and analyzes disease trends and implements appropriate intervention activities to reduce morbidity and mortality
- Acts as a resource for healthcare providers and the public regarding public health questions and issues
- Investigates illnesses and outbreaks of communicable diseases
- Works with the media to provide timely public education

NORTH DAKOTA DEPARTMENT *of* HEALTH

October 19, 2016

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EQUAL OPPORTUNITY EMPLOYER

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Immunization Program

The North Dakota Department of Health (NDDoH) Immunization Program serves the state of North Dakota in several ways. The NDDoH Immunization Program supplies free vaccines for children who are eligible for the Vaccines for Children (VFC) program. The program also coordinates investigations of vaccine-preventable diseases, provides education about immunizations and vaccine-preventable diseases, monitors the state's immunization rates and maintains and updates the North Dakota Immunization Information System (NDIIS).

Vaccine-Preventable Disease Surveillance

Lexie Barber, Surveillance Epidemiologist

Measles

In 2014, the United States saw the largest number of measles cases since the disease was considered eliminated from the country in 2000. Although this number decreased in 2015, there were still 111 cases reported from January 4th to April 2nd that were associated with the 2014 outbreak. There were an additional 48 cases reported during that time period that were not associated with the outbreak. In total there were 189 cases of measles reported from 24 states and the District of Columbia in 2015. Cases occurred most often in unvaccinated individuals or in individuals with an unknown status. The last reported case of measles in North Dakota occurred in 2011.

Measles is a serious respiratory disease caused by a virus. Measles usually starts with a fever. Individuals develop a cough, runny nose, and red eyes soon after. A rash of tiny red spots breaks out on the head, and eventually covers the entire body. Serious health complications can occur as a result of measles, including encephalitis, pneumonia, and death.

The measles, mumps, and rubella (MMR) vaccine protects against the measles virus. MMR vaccine is routinely recommended at ages 12-15 months and 4-6 years. Additionally, adults born in or after 1957 are recommended to have at least one documented dose of MMR vaccine or laboratory evidence of immunity. Adults who are considered high risk should have two documented doses of MMR vaccine or laboratory evidence of immunity. Healthcare workers, college students, and international travelers are considered high risk.

Meningitis

There were 348 cases of invasive meningococcal disease reported in the United States in 2015. Additionally, from 2009 to 2015, seven outbreaks involving *Neisseria meningitidis* serogroup B occurred on college campuses resulting in 41 cases and three deaths. In 2015, an outbreak at the University of Oregon resulted in seven cases and one student death and an outbreak at Providence College in Rhode Island resulted in two cases. North Dakota did not have any reports of meningococcal disease in 2015.

Meningococcal disease is an invasive infection of the bacteria *Neisseria meningitidis*. A common outcome of infection is meningitis. Symptoms accompanying meningitis include nausea, vomiting, photophobia, and altered mental status. Invasive meningococcal infection can also result in a blood stream infection, known as bacteremia. Symptoms of bacteremia include fatigue, vomiting, cold hands and feet, cold chills, severe aches or pain in the muscles, joints, chest or abdomen, rapid breathing, diarrhea, and a dark purplish rash.

The meningococcal vaccine routinely recommended for all adolescents is meningococcal conjugate vaccine (MCV4), which provides protection against serogroups A, C, Y, and W-135. MCV4 vaccine is recommended at age 11, with a booster dose at ages 16-18. One dose of MCV4 is required for seventh grade entry in North Dakota, and two doses are required to live on campus at North Dakota universities. MCV4 vaccine is also recommended for certain people at high risk, including travelers to countries where meningococcal disease is hyperendemic and asplenia. Two vaccines are available in the United States to prevent serogroup B meningococcal disease. Meningococcal B vaccines are recommended for those at increased risk for meningococcal disease. Additionally, adolescents and young adults ages 16-23 years may be vaccinated with a serogroup B meningococcal (MenB) vaccine to provide short-term protection against most strains of serogroup B meningococcal disease.

Pertussis

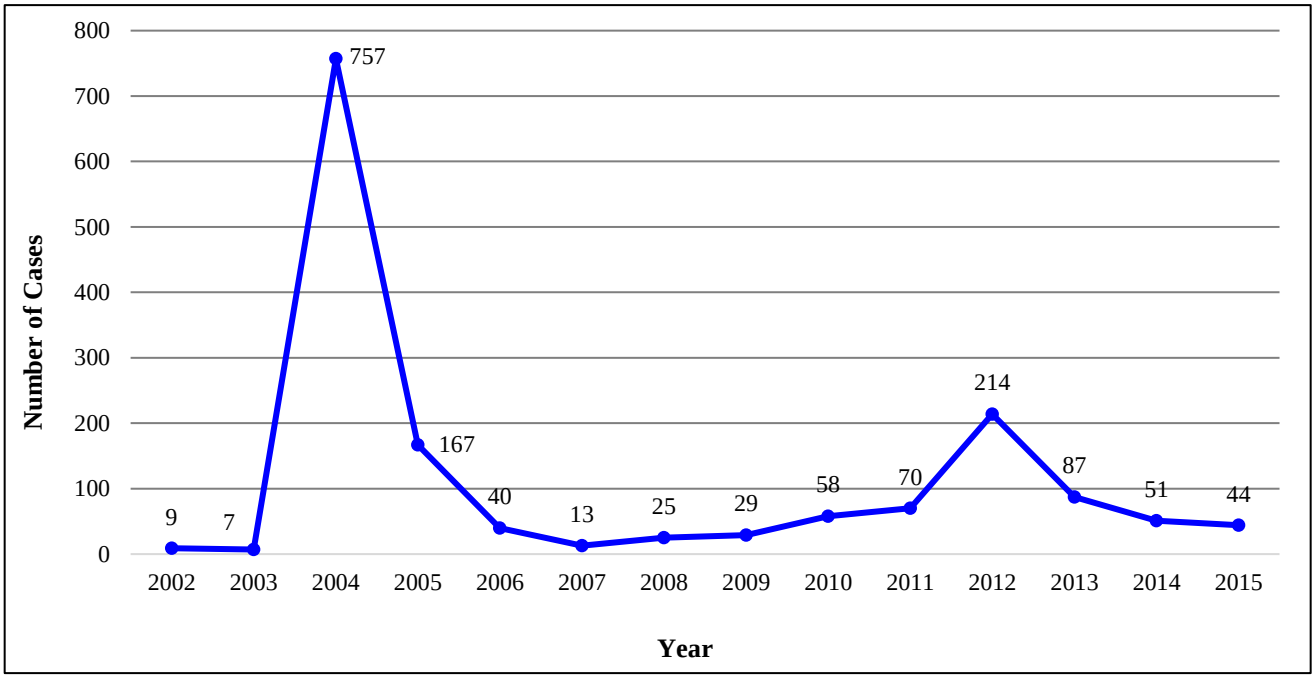
Pertussis or whooping cough is a respiratory disease caused by the bacteria *Bordetella pertussis*. The illness usually begins with cold-like symptoms and progresses to a cough, gradually becoming more severe. Pertussis is known for uncontrollable, violent coughing which often makes it hard to breath. The characteristic whooping sound is made when an individual has a severe coughing attack and needs to take a deep breath. Pertussis can be especially severe in unvaccinated infants and can results in pneumonia and even death.

Transmission of pertussis occurs via large respiratory droplets; pertussis is highly contagious during the first three weeks of coughing. Antibiotic treatment can limit transmission; after five days of appropriate antibiotic treatment, an individual is no longer contagious.

Two vaccines are routinely recommended to protect against pertussis. DTaP is routinely recommended for infants aged 2, 4, 6, and 15-18 months, with an additional dose given at age 4-6 years. Tdap vaccine is routinely recommended for adolescents aged 11-12. Adults who have never received a dose of Tdap are recommended to do so. Additionally, pregnant women are recommended to receive a dose of Tdap during each pregnancy between 27 and 36 weeks gestation. Tdap given during pregnancy not only protects the mother, but protective antibodies are passed to the fetus to protect the infant during the first few months of life.

In 2015, 18,166 cases of pertussis were reported in the United States. North Dakota reported 44 cases in 2015. Outbreaks of pertussis typically occur every three to four years. North Dakota’s last peak year was in 2012, with 214 cases.

Figure 1: Pertussis Cases in North Dakota, 2002-2015



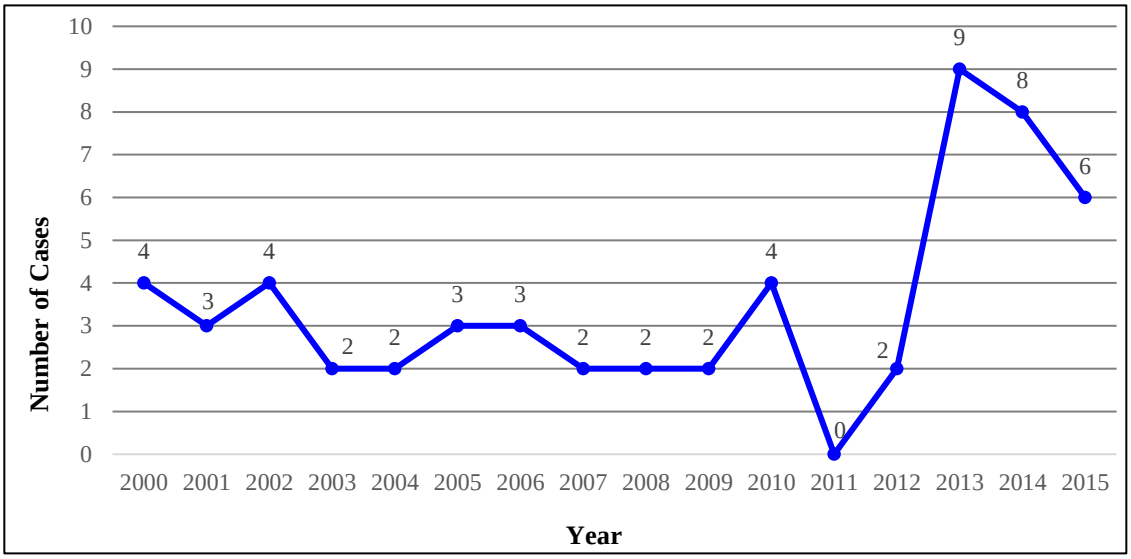
Hepatitis A

Hepatitis A is a liver infection caused by the hepatitis A virus. Symptoms of hepatitis A may include fever, fatigue, loss of appetite, nausea, abdominal discomfort, dark urine, pale stools, and jaundice. Hepatitis A infection does not result in a chronic disease, and symptoms typically last less than two months.

A person with hepatitis A can generally spread the disease from two weeks before symptoms start, to one week after symptom onset. Hepatitis A virus is found in the stool of infected people. The virus is highly contagious, and is spread by the fecal-oral route. Person-to-person transmission is possible when handwashing is inadequate after using the restroom, or when caring for an infected person, such as changing a diaper or cleaning stool. Hepatitis A is also spread when food or drinks, such as fruits, vegetables, raw shellfish, and untreated water or ice are contaminated. Hepatitis A is not transferred by blood.

There is no specific treatment for hepatitis A, but there is a vaccine to prevent the infection. Two doses of hepatitis A vaccine separated by six months are routinely recommended for all children at 12 to 23 months, and required if the child is attending child care in North Dakota. The vaccine is also recommended for people traveling to or working in a high risk area, men who have sex with men, users of injection drugs, people who anticipate having close contact with an international adoptee from high risk area, people who have clotting disorders, those who may be exposed in a laboratory setting, and those with chronic liver disease. In 2015, North Dakota reported 6 cases of Hepatitis A (**Figure 2**).

Figure 2: Hepatitis A Cases in North Dakota, 2002-2015



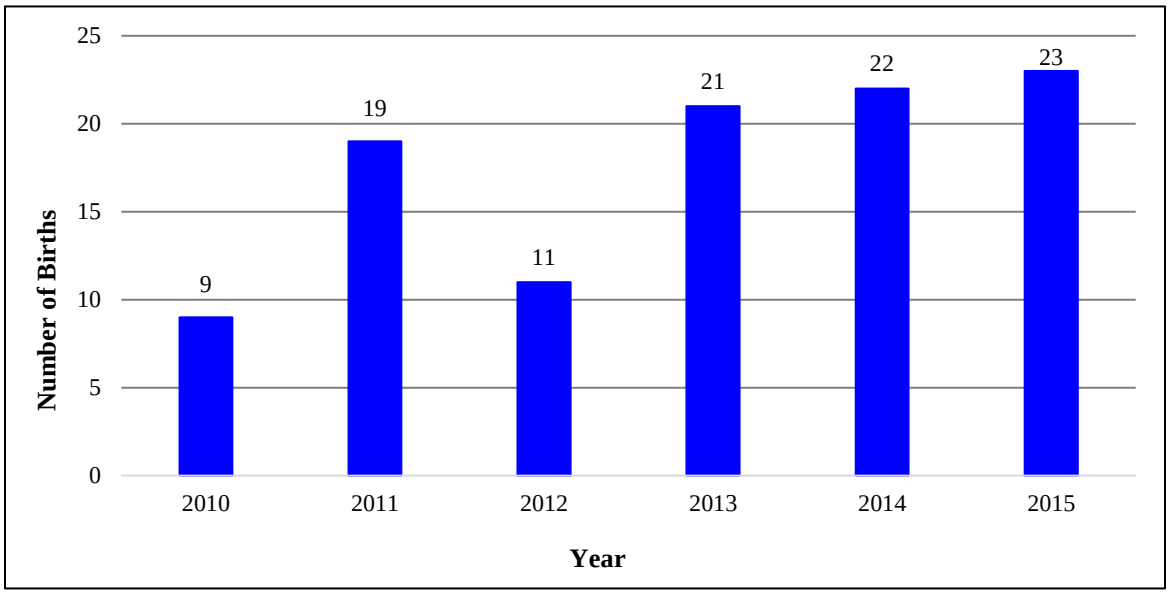
North Dakota Perinatal Hepatitis B Program

Hepatitis B is a virus that can be transmitted via blood, or other bodily fluids, and sexually. Chronically infected persons are at an increased risk for cirrhosis and liver cancer. Rates of new infection and acute disease are highest among adults, but chronic infections are more likely to occur in people infected as infants and young children. For infants and children, the two primary sources of hepatitis B infection are perinatal transmission from infected mothers and horizontal transmission from infected household contacts. The hepatitis B birth dose prevents between 70-95 percent of transmission to infants born to hepatitis B surface antigen positive women. When hepatitis B immune globulin (HBIG) is given in conjunction with the vaccine, between 85-95 percent of infections are prevented.

The North Dakota Perinatal Hepatitis B program seeks to prevent perinatal hepatitis B infections by managing infants born to hepatitis B positive women. Case management includes contacting hepatitis B positive women before delivery to educate them regarding hepatitis B virus transmission and the importance of HBIG and hepatitis B vaccine for their infant. Household contacts are also identified and recommended to be tested or vaccinated, depending on the circumstances. The perinatal hepatitis B coordinator then notifies the hospital where the woman is planning to deliver so they are prepared to administer HBIG and hepatitis B vaccine to the infant at birth.

After delivery, the perinatal hepatitis B coordinator works with the infant's pediatrician to ensure that all three doses of vaccine are given, and that hepatitis B serology testing is performed at 9 months of age, 1-2 months after the last dose of vaccine. Hepatitis B serology testing is essential to determine if the infant gained protection from the vaccine and to ensure that he/she did not develop hepatitis B infection. If the infant does not show a protective immune response from vaccination, the hepatitis B series must be repeated and the infant must be retested. The number of births to hepatitis B positive women has increased in North Dakota since 2010 (**Figure 3**).

Figure 3: The number of births to hepatitis B positive women in North Dakota by year, 2010-2015



Kindergarten Vaccination Rates

Each year, the NDDoH gathers school immunization rates through the school immunization survey. The survey is self-reported by schools and is sent out each fall through the Department of Public Instruction (DPI). The survey is submitted online, and is due around mid-November. For the 2015-2016 school year, the response rate from schools was 95.1 percent (423/445). All of the kindergarten vaccination rates for the 2015-2016 school year fall below the Healthy People 2020 goals of 95 percent coverage for all school entry vaccinations.

Figure 4: North Dakota kindergarten entry immunization rates for the 2015-2016 school year

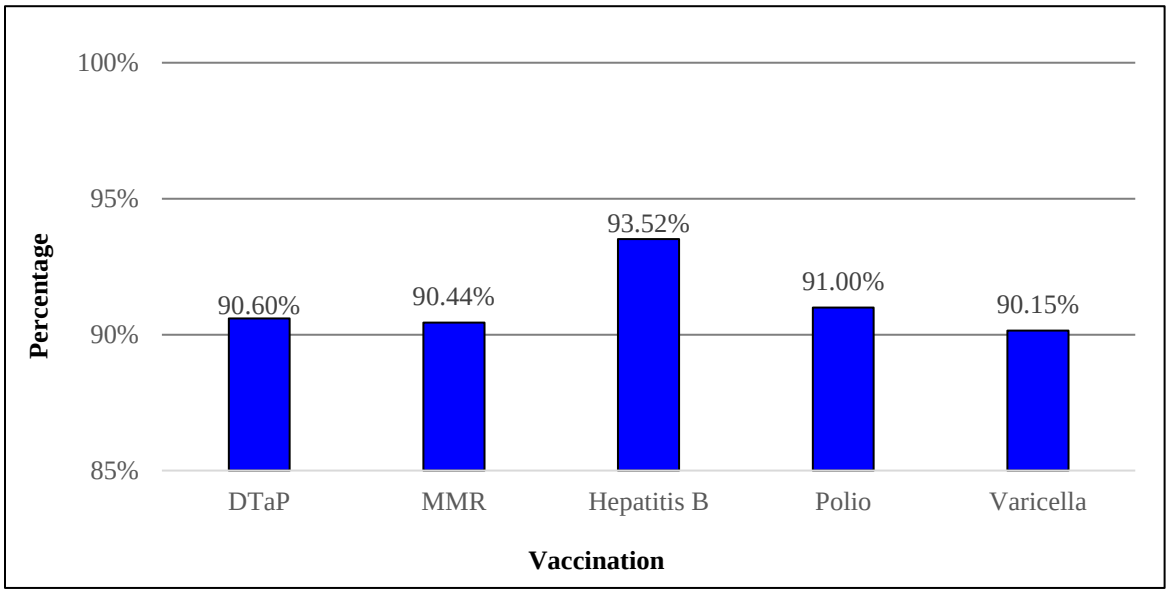
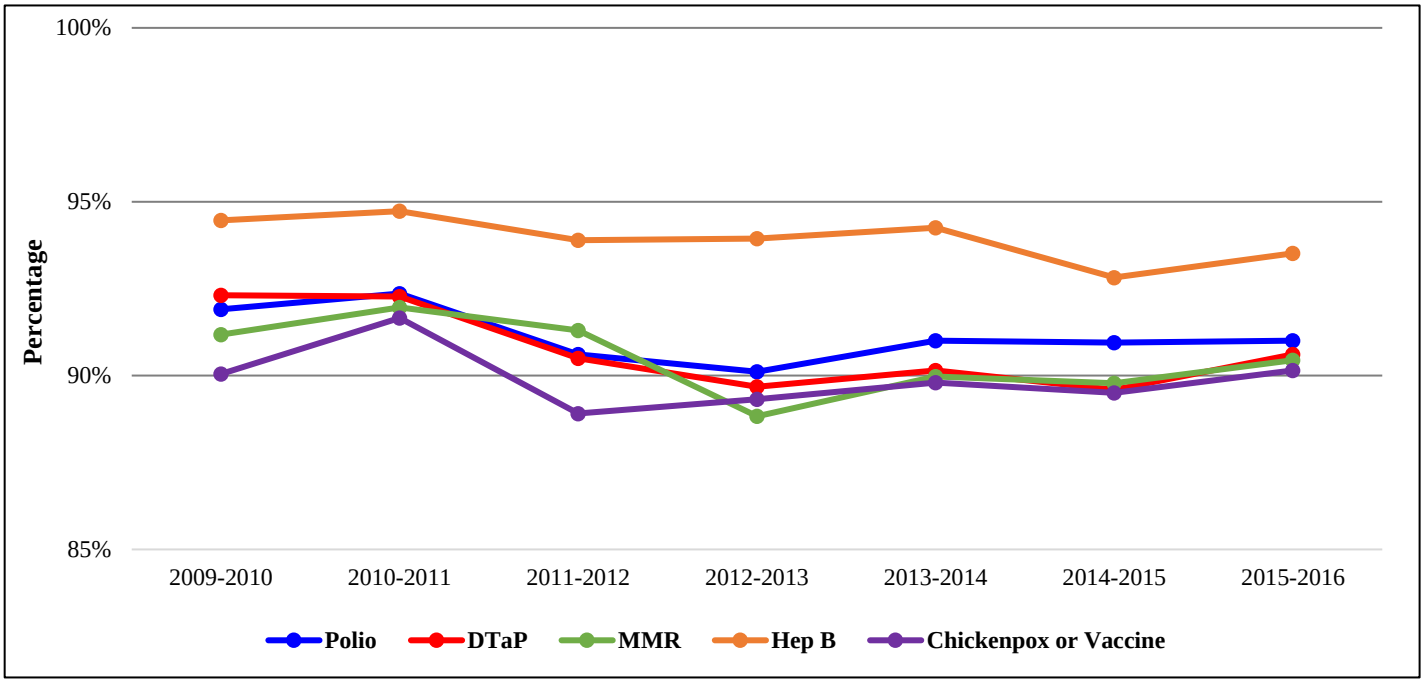
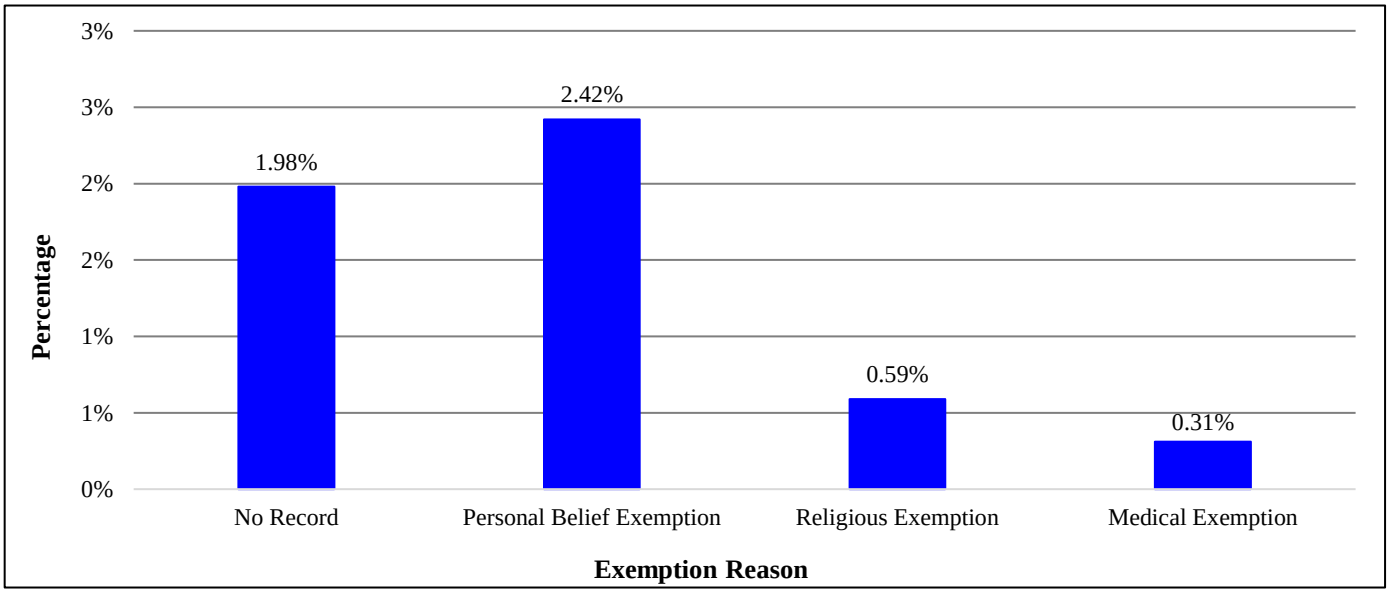


Figure 5: North Dakota kindergarten entry immunization rates from 2009 to 2015



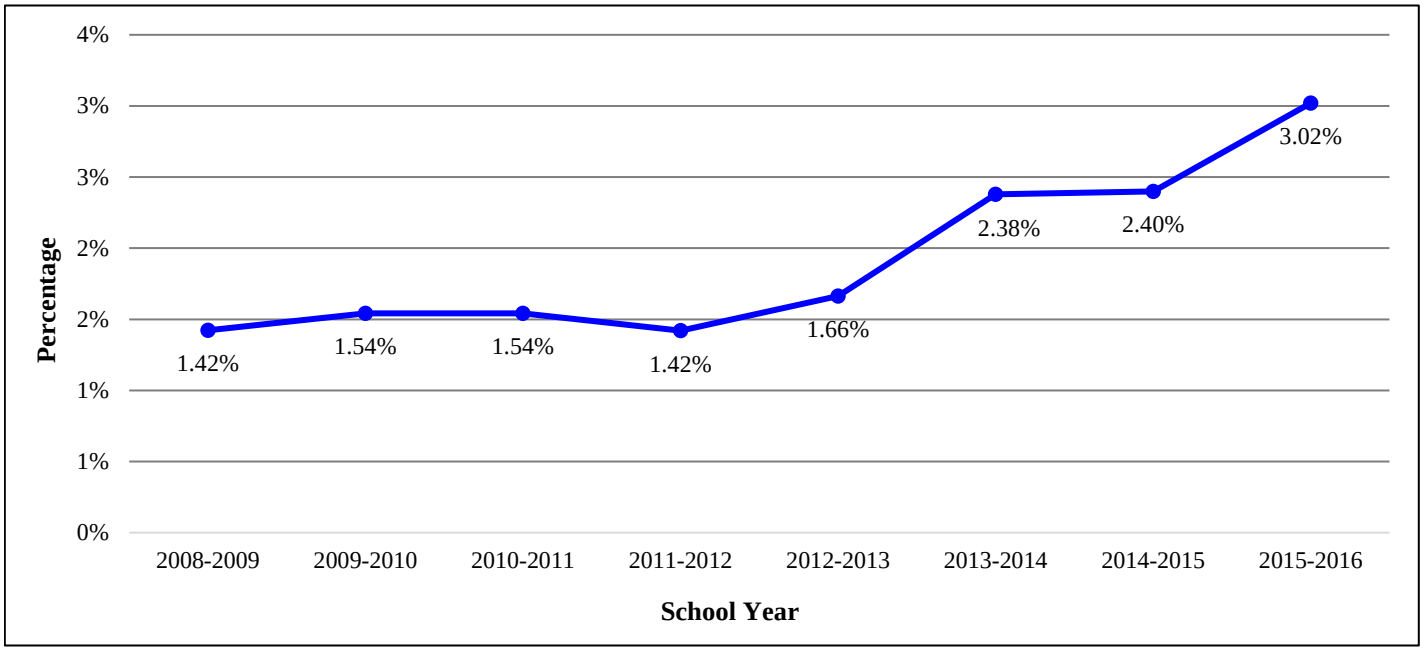
Additionally, vaccination coverage rates have been trending downward since the 2010-2011 school year.

Figure 6: North Dakota kindergarten entry exemption rates for the 2015-2016 school year



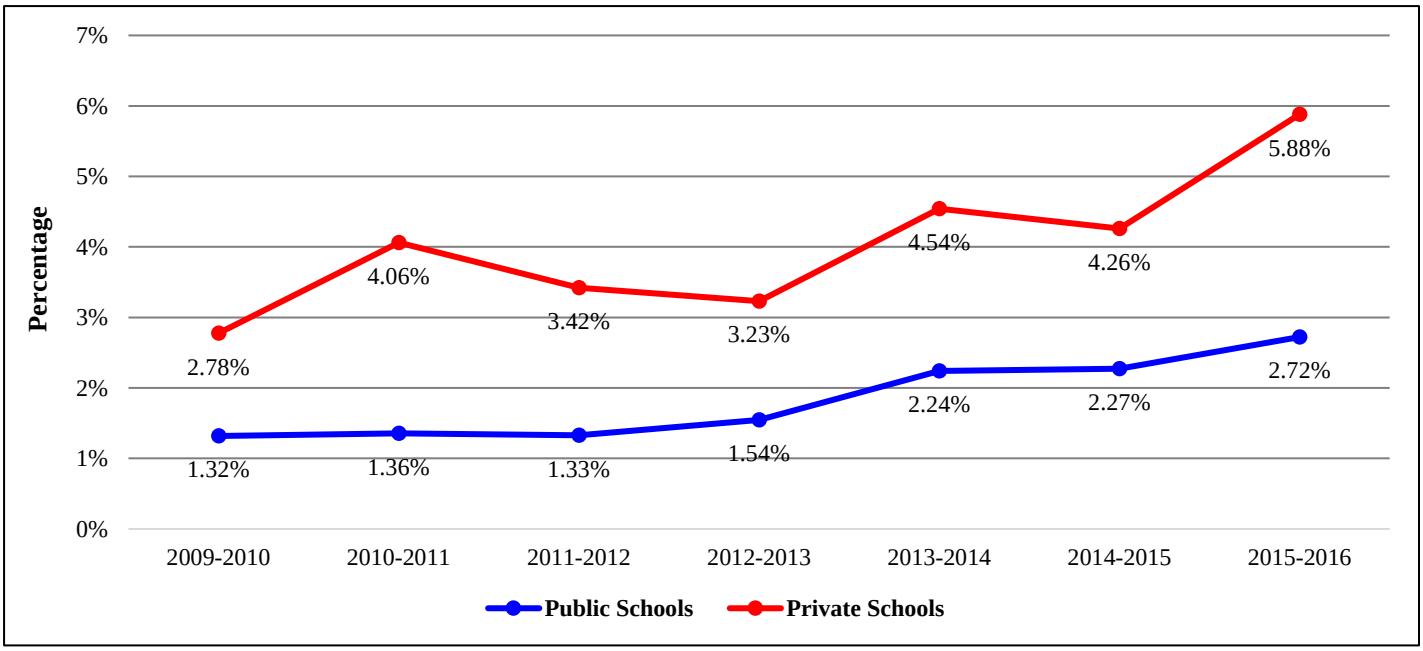
Exemptions rates are continuing to increase in kindergarten-aged children, but not nearly enough to accommodate for the drop in immunization rates. The drop may be attributed to a number of factors: these children may truly be up-to-date but the schools are not collecting updated immunization records; schools are not reporting exemptions; or schools are not enforcing requirements and allowing children not up-to-date to attend school.

Figure 7: North Dakota kindergarten entry exemption rates from 2008 to 2015



The rise in exemptions becomes more apparent when kindergarten data is separated by school type. This is shown in **Figure 8**.

Figure 8: North Dakota kindergarten entry exemption rates from 2008 to 2015 stratified by school type



Seventh Grade School Vaccination Rates

Tdap and MCV4 were first required for middle school entry in 2008. This was changed for the 2014-2015 school year, to require Tdap and MCV4 for seventh grade entry in order to standardize the recommendations. For the 2015-2016 school year, Tdap and meningococcal coverage rates were about 86% and 84%respectively. Seventh grade entry exemption rates for Td and meningococcal are lower than kindergarten entry exemption rates.

Figure 9: North Dakota seventh grade entry immunization rates for the 2015-2016 school year

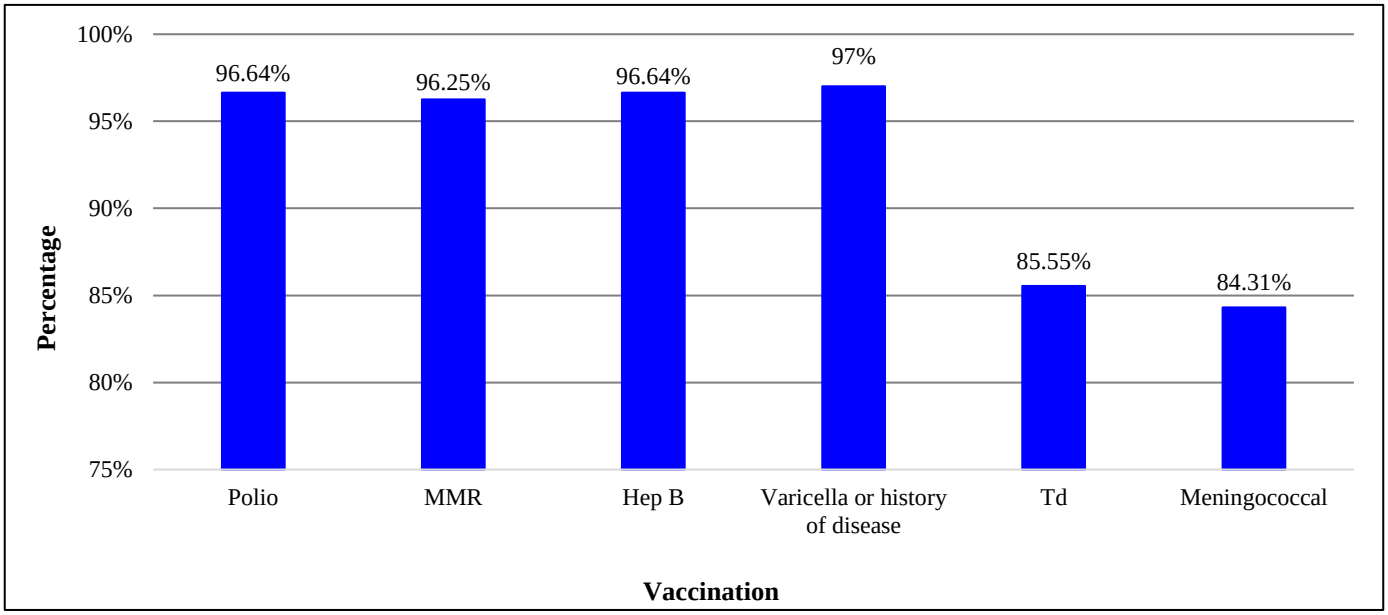
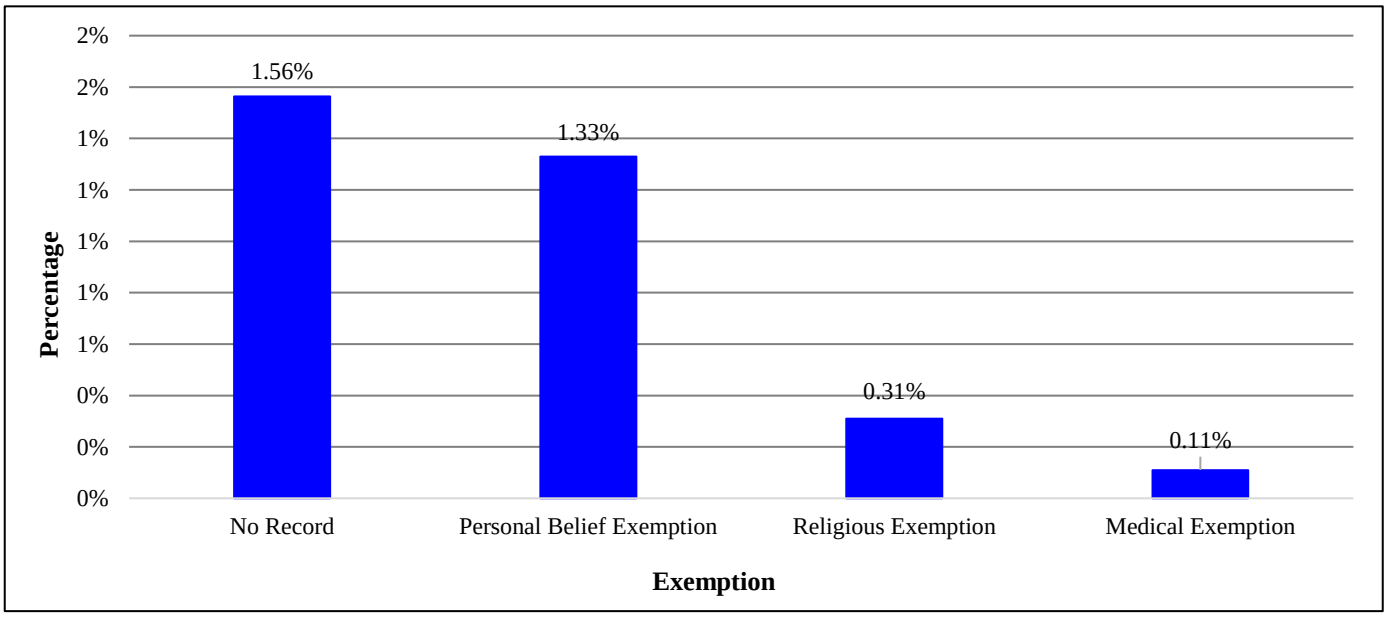


Figure 10: North Dakota seventh grade Tdap and Meningococcal entry exemption rates for the 2015-2016 school year



Epidemiology and Surveillance Program

The Epidemiology and Surveillance Program is responsible for the management and surveillance of infectious disease activities, such as enteric/foodborne, vectorborne, zoonotic, influenza, antibiotic resistant infections, parasitic infections, waterborne diseases, non-flu respiratory viruses, healthcare-associated infections, and mycotic infections. Additionally, the Epidemiology and Surveillance Program provides cross cutting and flexible epidemiology and health information systems capacity, which addresses a variety of infectious diseases. Additional functions include management of the NDDoH's syndromic surveillance program, general infection control assessment and outbreak response activities.

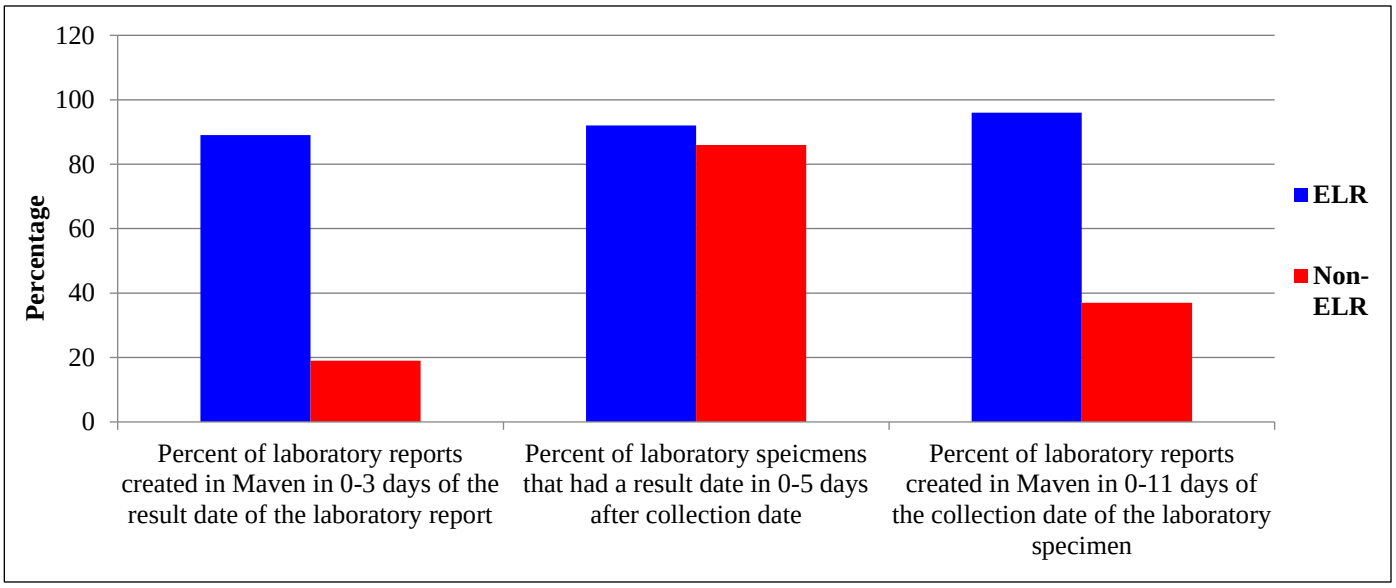
Electronic Laboratory Reporting (ELR)

Alicia Lepp, NEDSS Coordinator

Electronic Laboratory Reporting (ELR) is the electronic transmission of laboratory reports from hospitals, public and reference laboratories to the Division of Disease Control. ELR can improve timeliness, reduce manual data entry errors, and result in reports that are more complete. The NDDoH began receiving electronic laboratory reports in 2009 with the NDDoH's Division of Laboratory Services (DLS). At the end of 2015, the NDDoH had ten laboratories in production with ELR, two of which had been added in 2015.

The total numbers of laboratory results received in 2015 were 30,440. Of those, 24,265 (79%) were reported through ELR. Of the laboratory reports created in Maven by ELR, 89% were created in Maven in zero to three days of the result date of the initial laboratory report, 92% had zero to five days between the collection date of the laboratory specimen and the date of result of the initial laboratory report, and 96% were created in Maven in zero to eleven days between collection date of the laboratory specimen. Of the laboratory reports created in Maven by non-ELR methods (i.e., manual data entry), 19% were created in Maven in zero to three days of the result date of the initial laboratory report, 86% had zero to five days between the collection date of the laboratory specimen and the date of result of the initial laboratory report, and 37% were created in Maven in zero to eleven days between collection date of the laboratory specimen (**Figure 11)**.

Figure 11: Comparison of laboratory reports reported to the NDDoH, 2015



The number of laboratory reports received via ELR increased by 54% from the 15,714 records received in 2014. However, ELR timeliness appears to have decreased in the time that it takes for the laboratory report to be created in Maven from the date of the result of the initial laboratory report, with 94% of reports being created in Maven in 0-3 days in 2014. The time that it takes for the other two measures increased slightly from 89% of the reports having 0-5 number of days between the specimen collection date and the result date in 2014, and from 95% of laboratory reports having 0-11 days between the specimen collection date and the date when the laboratory report was created in Maven in 2014.

There were 169 laboratory reports in Maven in 2015 that had 100 or more days between the specimen collection date and the date the report was created in Maven and/or the initial laboratory result date and the date the report was created in Maven. A couple of explanations exist for these late created reports. One is that 46 cases of E. coli were sent via ELR from the North Dakota Public Health Laboratory (NDPHL). The NDPHL can serotype *E. coli* O157:H7. If the specimen does not type out as O157:H7, the specimen is forwarded to the Centers for Disease Control and Prevention (CDC) for serotyping. Results from CDC can take months to receive, thus bringing our span of time from collection date to laboratory create date to being 100 days or greater. Another explanation is that six laboratory reports were either merged with another case or were manually manipulated, thereby resulting in a change of a create date in Maven. The final explanation is that one laboratory sending ELR data had a refresh in their system in 2015 which brought in missing data from historical reports and resulted in historical data being sent to the NDDoH through their ELR feed. This system refresh resulted in 129 laboratory reports that had not been previously reported by this facility with specimen collection dates and laboratory report dates from 2013 and 2014.

Looking at the same time period, two hospitals' 2014 laboratory reports were compared with their 2015 laboratory reports after implementing ELR. From March 23, 2014, to December 31, 2014, NDDoH received 104 laboratory reports from Laboratory A, compared to 542 reports received during the same time period in 2015 following implementation of ELR. The median number of days from result date of laboratory report from Laboratory A to when a case was created in Maven improved by 60% and from the collection of laboratory specimen to when a case was created in Maven improved by 67% with the implementation of ELR.

From December 15, 2014, to December 31, 2014, NDDoH received 41 laboratory reports from Laboratory B, compared to 62 reported during the same time period in 2015 following implementation of ELR. The median number of days from result date of laboratory report from Laboratory B to when a case was created in Maven improved by 67% and from collection date of laboratory specimen to when a case was created in Maven by 67% with the implementation of ELR.

Analysis showed an improvement in both the numbers of reports received by the NDDoH and the timeliness from specimen collection and report date to creation in Maven that was achieved after implementation of ELR.

Implementation of ELR improves timeliness and accuracy of laboratory results. A greater proportion of cases is entered into Maven more quickly from the date of laboratory result when they are reported ELR than non-ELR. This results in quicker follow-up time for NDDoH staff to speak with confirmed cases and determine more accurate risk factors or exposures, along with any public health action that is needed. Additionally, fewer data entry errors are made with ELR than non-ELR reporting methods.

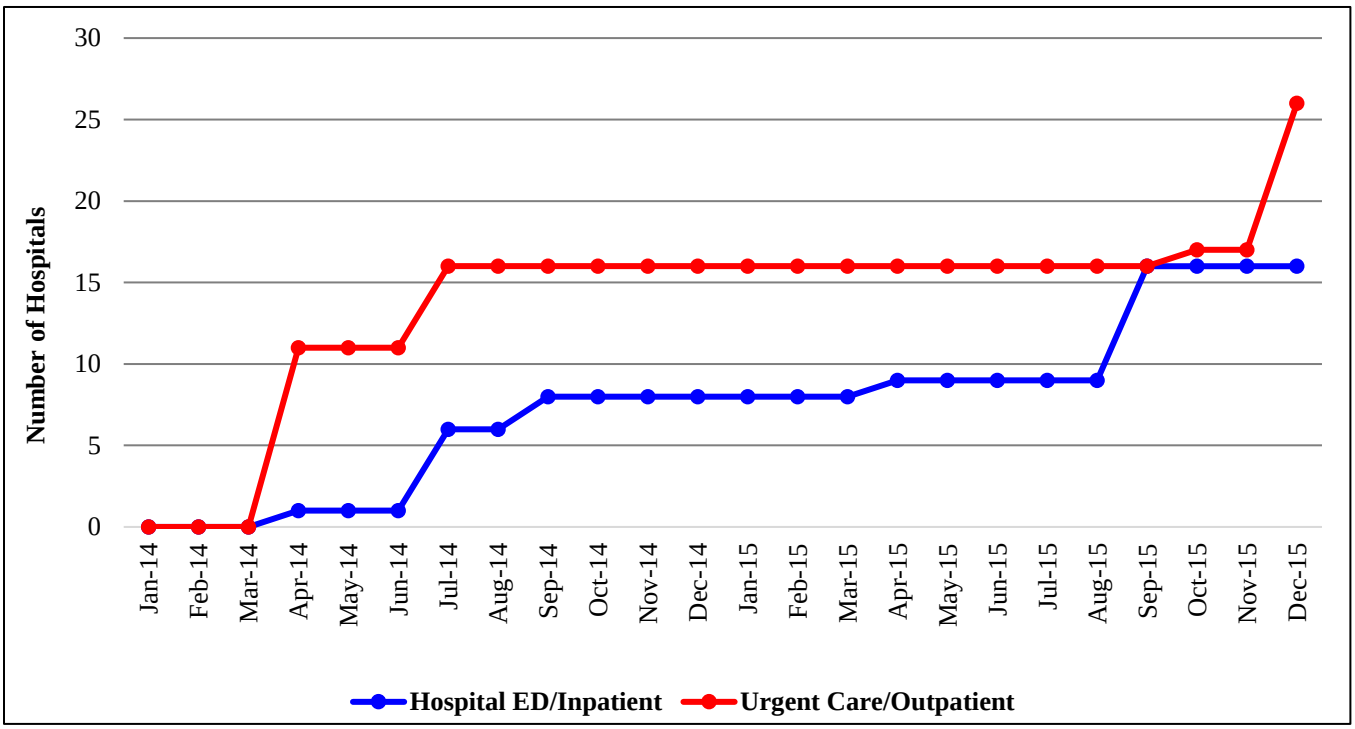
Syndromic Surveillance

Jill Baber, Syndromic Surveillance Epidemiologist

Syndromic surveillance is a form of biosurveillance that includes de-identified patient level data from hospitals, urgent care facilities, and outpatient clinics. Data collected includes chief complaint, diagnosis, and other "reason for visit" data from multiple sources to monitor a variety of "syndromes"—related sets of "reason for visit" data. The most commonly monitored syndromes include influenza-like illness (ILI), gastrointestinal illness (GI), rash, neurological, injuries, sepsis, and severe illness and death. We also create new syndromes in response to rapidly changing health needs, such as during national foodborne disease outbreaks, and in response to emerging diseases or threats, such as Zika virus.

This year, the NDDoH continued to use the syndromic surveillance platform, BioSense 2.0, to monitor any change in syndrome trends daily. This is the second year that data has been sent to the BioSense 2.0 platform. For 2015, the NDDoH added eight hospitals and 10 outpatient clinics to the BioSense production environment **(Figure 12)**.

Figure 12: Number of hospitals and clinics reporting to the North Dakota Syndromic Surveillance System, 2014-2015



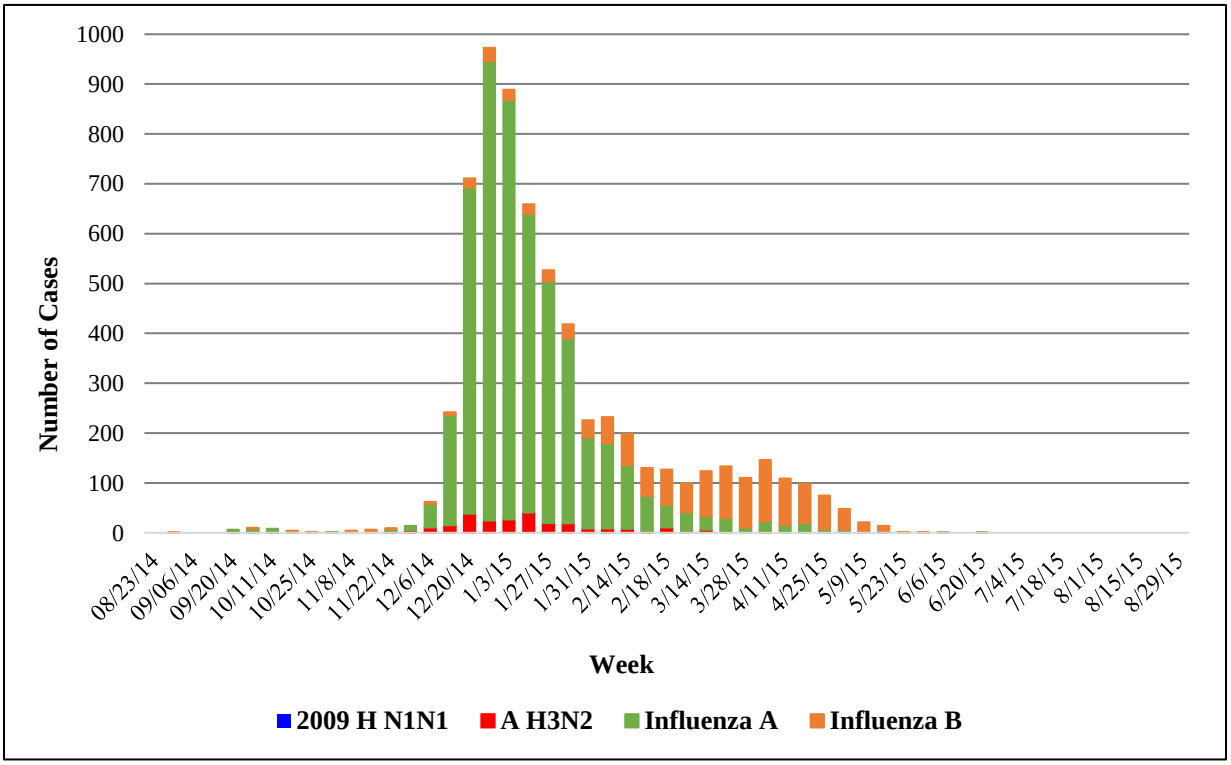
Respiratory Diseases

Jill Baber, Influenza Surveillance Epidemiologist

2014-2015 Influenza Season

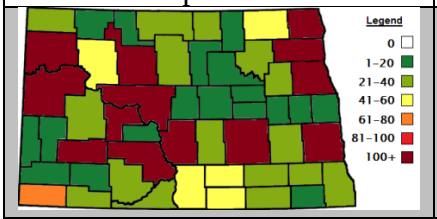
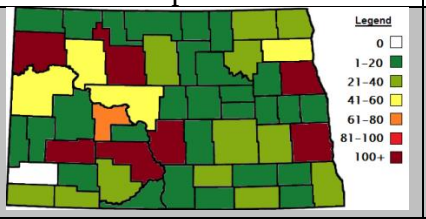
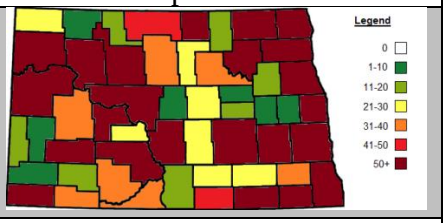
Influenza surveillance activities for the 2014-15 season officially began Sept. 1, 2014. The NDDoH requires all laboratory-identified cases of influenza, including positive rapids, be individually reported to the NDDoH year-round. Off-season activity running up to the 2014-15 season was higher than normal, and for the third season in a row, the seasonal peak came early. This season was our most severe season on record, with 6,443 laboratory-identified cases of influenza reported. Influenza A H3N2 dominated the first part of the season, and about two thirds of the circulating A H3N2 viruses were poorly matched to the seasonal vaccine. Influenza B took over as the predominant strain at the end of February, and the season-level activity lasted longer than usual. North Dakota's influenza activity was generally similar to national trends, but a side-by-side comparison is not possible because influenza is not a nationally notifiable disease. Pediatric deaths caused by influenza are nationally notifiable, but North Dakota has not had a pediatric death reported since the 2010-2011 season.

Figure 13: North Dakota 2014-2015 reported case count for seasonal influenza



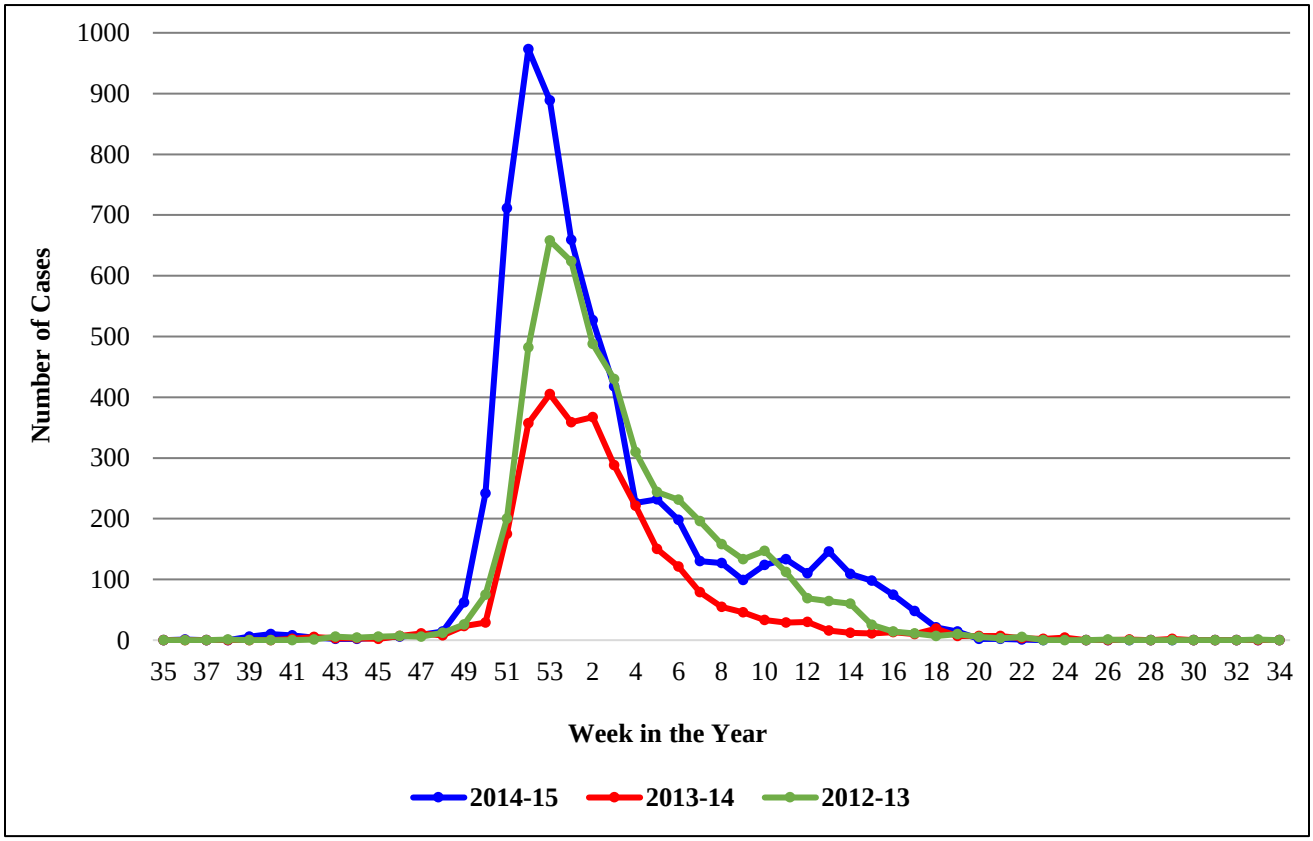
The 2014-15 season was similar to the 2012-13 season. Both seasons saw more influenza activity than average, both were A H3N2 predominant seasons, and both saw A H3N2 strains circulating that had drifted from the vaccine strain. One reason 2014-15 may appear more severe than 2012-13 is the NDDoH began receiving influenza reports electronically from some providers, reducing the amount of unreported influenza. In contrast, the 2013-14 season was a 2009 A H1N1 predominant season, and the case count more closely matched the average number of cases reported in North Dakota (2,500-3,000). The timing of our last few influenza seasons has been unusually similar, with all three seasons peaking near the end of December. More information on influenza in North Dakota can be found at www.ndflu.gov.

Table 1: North Dakota seasonal influenza summary, 2012-2015

2012-13 season	2013-14 season	2014-15 season
predominantly **A H3N2**	predominantly **2009 A H1N1**	predominantly **A H3N2**
4,834 lab-confirmed cases: • **204** A H3N2 • **18** 2009 A H1N1 • **3,027** A not subtyped • **1,584** B • **2** unspecified	**2,919** lab-confirmed cases • **3** A H3N2 • **452** 2009 A H1N1 • **2,309** A not subtyped • **155** B • **0** unspecified	**6,443** lab-confirmed cases: • **256** A H3N2 • **2** 2009 A H1N1 • **4,963** A not subtyped • **1,219** B • **0** unspecified
		
216 hospitalizations	**147** hospitalizations	**275** hospitalizations
9 deaths	**8** deaths	**54** deaths**
32 long term care outbreaks	**3** long term care outbreaks	**40** long term care outbreaks
peak: week of Dec. 23rd	peak: week of Dec. 29th	peak: week of Dec. 21st

**The definition of an influenza death was changed for to the 2014-15 season in order to be more inclusive, and cannot be compared with death counts from previous seasons.

Figure 14: Influenza cases by week, North Dakota 2012-2015 Seasons



CDC testing was available via the DLS, which received 41 specimens for testing during the outbreak. Specimens were sent to the CDC for enterovirus typing and testing. Of these specimens, 11 (27%) were positive for EV-D68. Twelve (29%) specimens tested positive for another type of enterovirus or a rhinovirus. (Rhino viruses are the most common cause of colds.) Specimens were accepted for only patients with severe illness. The actual incidence of EV-D68 in North Dakota during the outbreak is unknown because EV-D68 is not reportable; however, it is estimated the incidence in the general population was likely quite high, with a large majority of people with the disease experiencing mild or no symptoms, which is typical for enteroviruses. Nationally, the CDC received about 2,600 specimens for testing. Of those, about 36% tested positive for EV-D68. Rhinoviruses and other types of enteroviruses were also common among samples tested at both the state and national level. No EV-D68 deaths were identified in North Dakota; 14 deaths were identified nationwide. Children with chronic respiratory conditions (such as asthma) and other underlying conditions were found to be at increased risk for developing severe disease associated with EV-D68 (54% of North Dakota cases), as well as other respiratory pathogens.

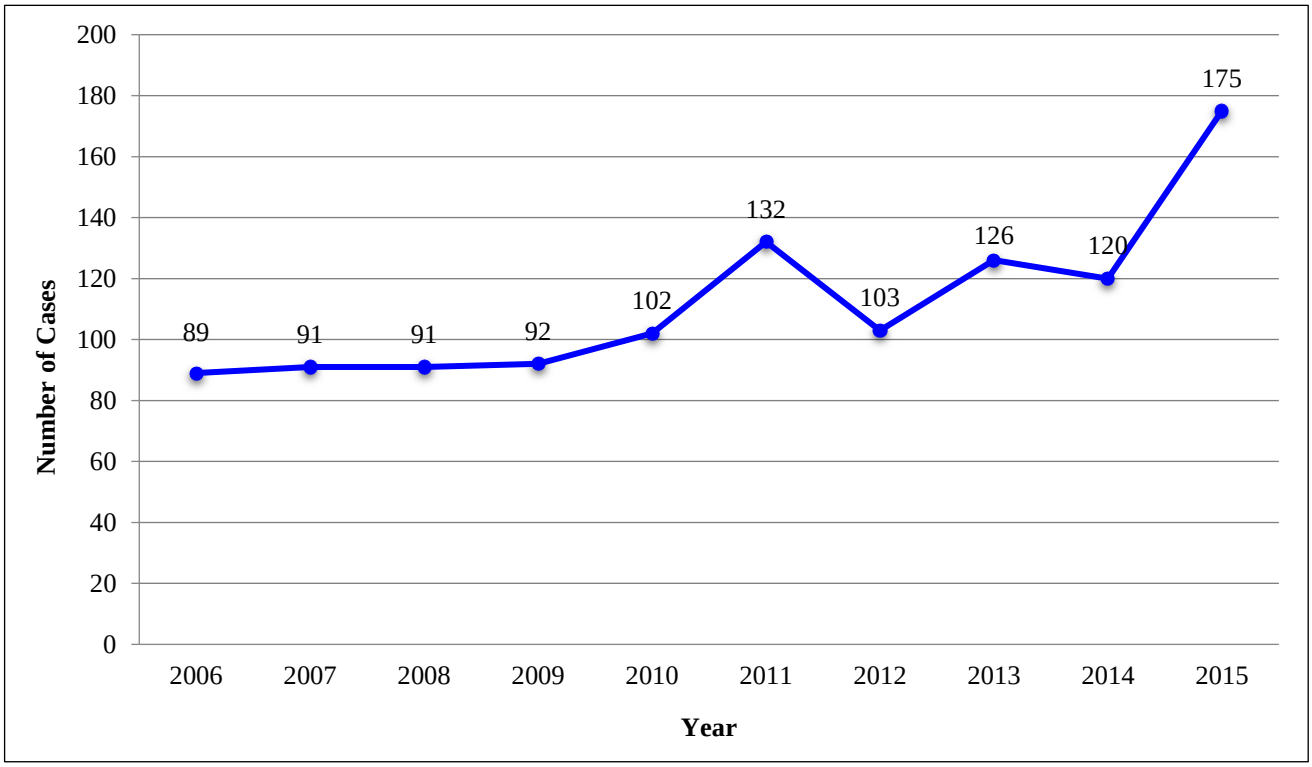
Enteric Diseases

Laura Cronquist, Vectorborne and Special Projects Coordinator

Campylobacteriosis

In 2015, 175 cases of campylobacteriosis were reported to the NDDoH, a 46% increase from the 120 cases reported in 2014 (**Figure 15**). Statewide, campylobacter incidence rate was 23.1 cases per 100,000 people in 2015. Forty-four counties reported cases, with Divide (163.3 cases per 100,000 people), McIntosh (145.0 cases per 100,000 people) and McHenry (117.3 cases per 100,000 people) having the highest incidence of campylobacteriosis.

Figure 15: North Dakota Campylobacteriosis Case Counts by Year, 2006-2015

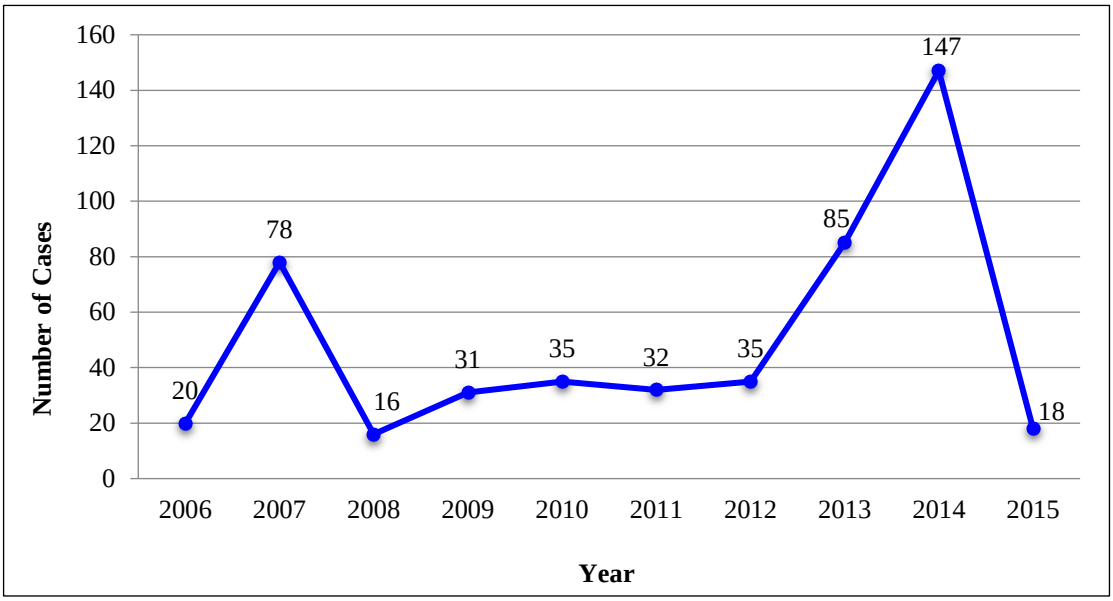


The median age of cases of campylobacteriosis was 39 years (range: 1-96 years). Persons less than five years of age had the highest age-specific incidence rate (59.2 cases per 100,000 people). One-hundred-six (61%) of the reported cases were male. Twenty-four (14%) cases were hospitalized.

Cryptosporidiosis

In 2015, 18 cases of cryptosporidiosis were reported to the NDDoH, an 88% decrease from 147 cases reported in 2014 (**Figure 16**). Statewide cryptosporidiosis incidence was 2.4 cases per 100,000 people in 2015. Ten counties reported cases, with Morton (13.2 cases per 100,000 people), Grand Forks (5.6 cases per 100,000 people) and Ramsey (17.2 cases per 100,000 people) having the highest incidence of cryptosporidiosis.

Figure 16: North Dakota Cryptosporidiosis Case Counts by Year, 2006-2015

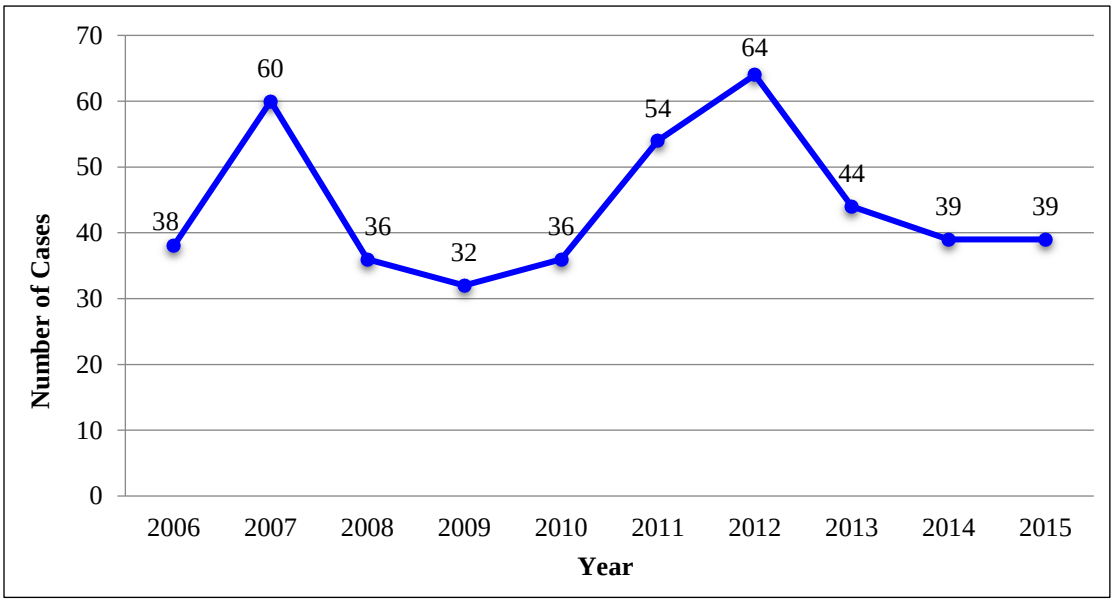


The median age of cryptosporidiosis cases was 28 years (range: 1-58 years). Persons aged 30-34 years had the highest age-specific incidence rate (5.5 cases per 100,000 people). Thirteen (72%) of the reported cases were male. One (5%) case was hospitalized.

Giardiasis

In 2015, 39 cases of giardiasis were reported to the NDDoH, which was equal to the 39 cases reported in 2014 (**Figure 17**). Statewide giardiasis incidence was 5.2 cases per 100,000 people in 2015. Fourteen counties reported cases, with Logan (51.7 cases per 100,000 people), Hettinger (37.0 cases per 100,000 people) and LaMoure (24.2 cases per 100,000 people) having the highest incidence of giardiasis.

Figure 17: North Dakota Giardiasis Case Counts by Year, 2006-2015

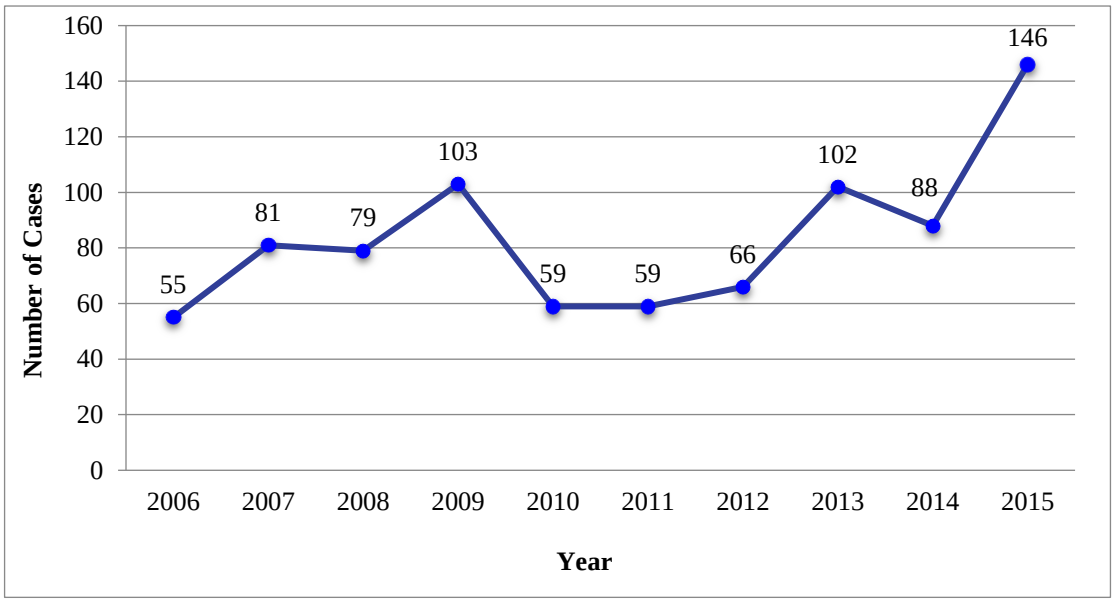


The median age of cases of giardiasis was 35 years (range: 3-72 years). Persons aged 40-44 years had the highest age-specific incidence rate (15.1 cases per 100,000 people). Twenty-four (62%) cases were male. Four (10%) cases were hospitalized.

Salmonellosis

In 2015, 146 cases of salmonellosis were reported to the NDDoH, a 66% increase from 88 cases reported in 2014 (**Figure 18**). Statewide salmonellosis incidence was 19.3 cases per 100,000 people in 2015. Thirty-three counties reported cases, with Logan (103.4 cases per 100,000 people), Adams (84.8 cases per 100,000 people), and Sheridan (76.3 cases per 100,000 people) having the highest incidence of salmonellosis.

Figure 18: North Dakota Salmonellosis Case Counts by Year, 2006-2015



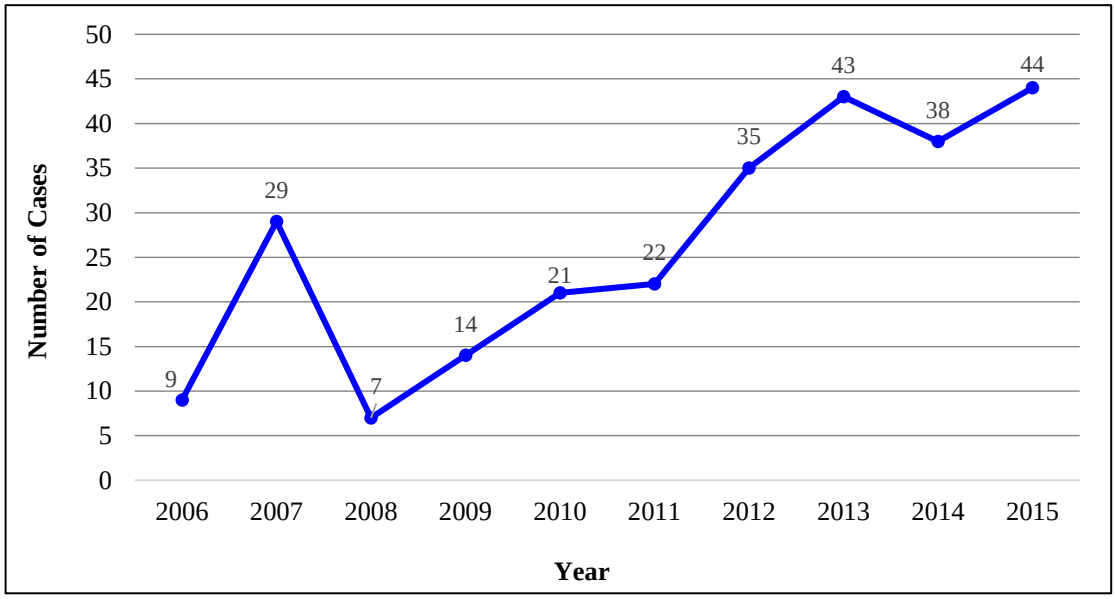
The median age of salmonellosis cases was 37 years (range: 0-99 years). Persons aged 25-29 years had the highest age-specific incidence rate (24.3 cases per 100,000 people). Seventy-four (51%) cases were female. Thirty-seven (25%) cases were hospitalized.

Shiga toxin-producing E. coli (STEC)

In 2015, 44 cases of STEC were reported to the NDDoH, a 16% increase from the 38 cases reported in 2014 (**Figure 19**). Of the 44 cases in 2015, 13 were *E.coli* O157:H7. In 2014, 12 of the 38 cases were *E.coli* O157:H7. Statewide STEC incidence was 5.4 cases per 100,000 people in 2015. Eighteen counties reported cases, with Logan (51.7 cases per 100,000 people), LaMoure (48.5 cases per 100,000 people), and Grant (41.9 cases per 100,000 people) having the highest incidence of STEC.

The median age of cases of STEC was 16 years (range: 1-56 years). Persons aged 15-19 years had the highest age-specific incidence rate (22.1 cases per 100,000 people). Twenty-two (50%) cases were female and nine (20%) cases were hospitalized.

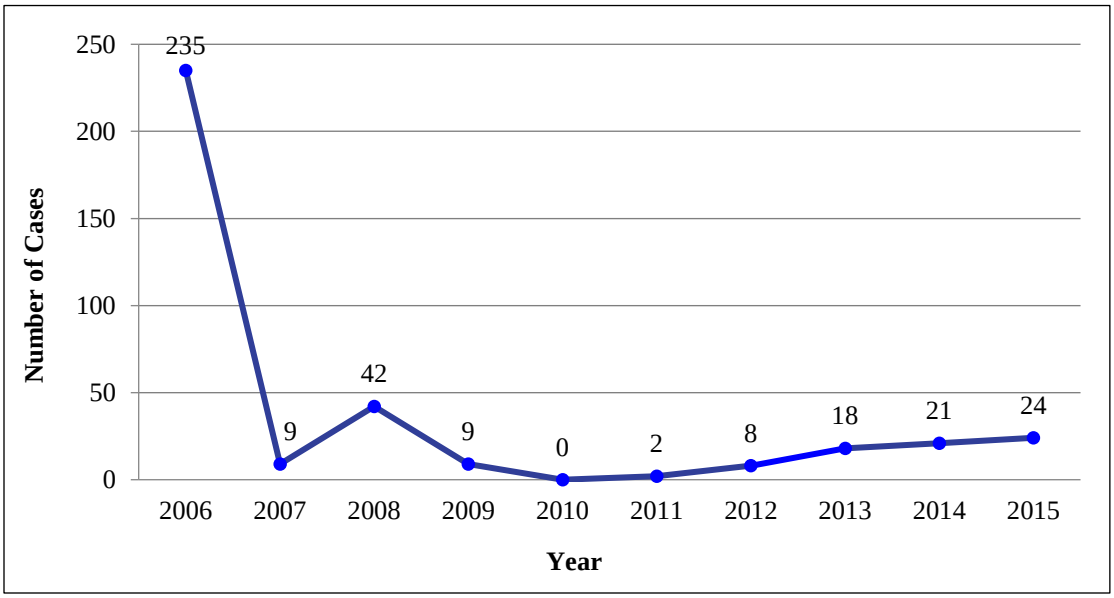
Figure 19: North Dakota STEC Case Counts by Year, 2006-2015



Shigellosis

In 2015, 24 cases of shigellosis were reported to the NDDoH, a 14% increase from the 21 cases reported in 2014 (**Figure 20**). Statewide shigellosis incidence was 3.2 cases per 100,000 people in 2015. Nine counties reported cases, with Rolette (81.9 cases per 100,000 people), Sargent (25.8 cases per 100,000 people), and Dunn (21.5 cases per 100,000) having the highest incidence of shigellosis.

Figure 20: North Dakota Shigellosis Case Counts by Year, 2006-2015



The median age of cases of shigellosis was 15.5 years (range: 1-79 years). Persons aged 5-9 years had the highest age-specific incidence rate (13.8 cases per 100,000 people). Twelve (50%) were male. Four (17%) cases were hospitalized. For more information about enteric infections and foodborne gastrointestinal illness, visit www.ndhealth.gov/disease/GI.

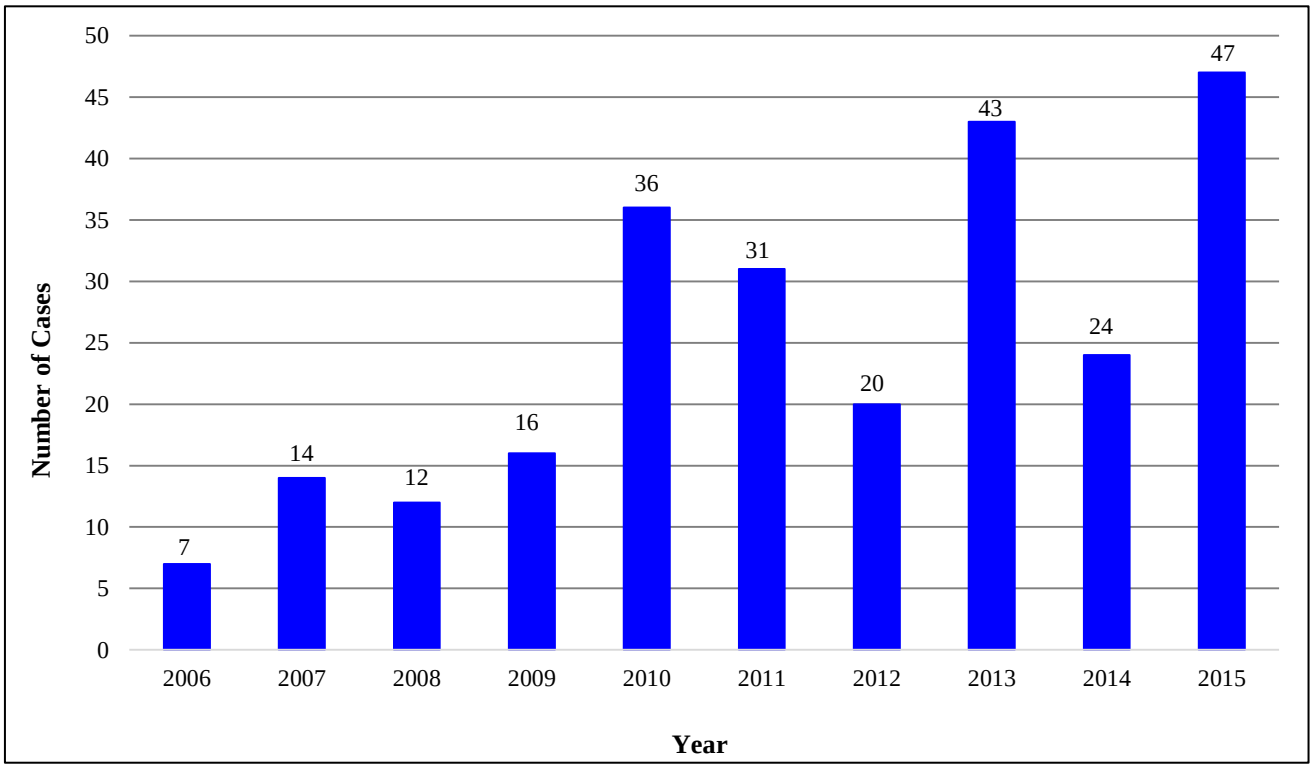
Zoonotic Diseases

Laura Cronquist, Vectorborne and Special Projects Coordinator

Tickborne Diseases (Anaplasmosis, Babesiosis, Ehrlichiosis, Lyme Disease, Rocky Mountain Spotted Fever)

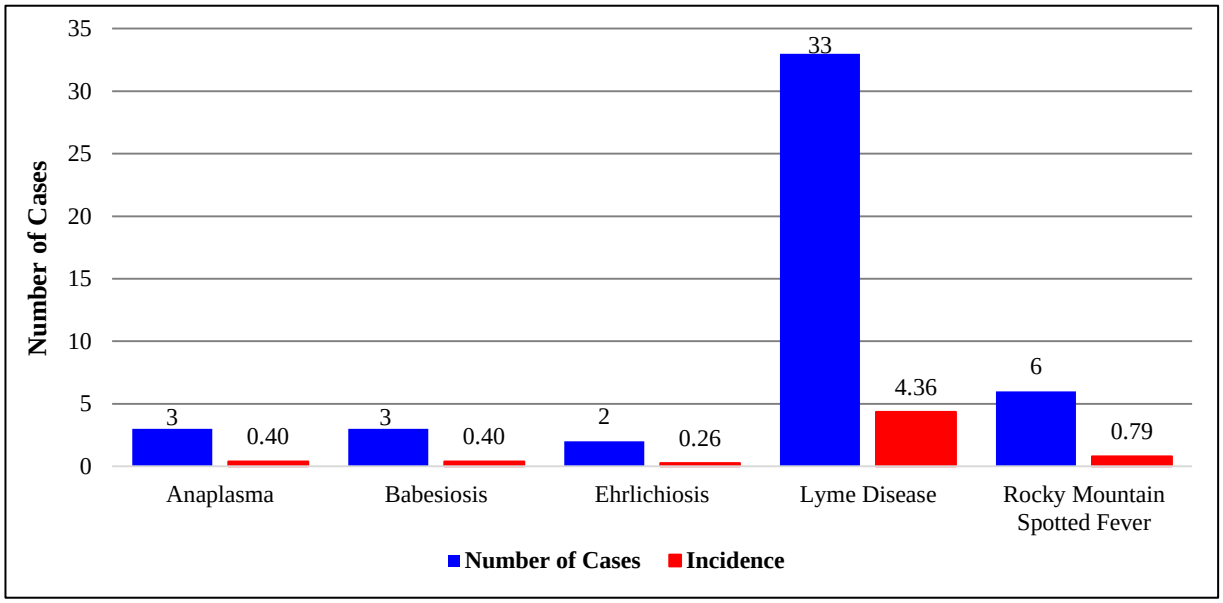
In 2015, 47 cases of tickborne diseases were reported to the NDDoH, a 96% increase from the 24 cases reported in 2014 **(Figure 21)**. Statewide, tickborne disease incidence was 6.2 cases per 100,000 people in 2015. Fifteen counties reported cases, with Towner (44.0 cases per 100,000 people), Adams (42.4 cases per 100,000 people), and Pembina (28.2 cases per 100,000 people) having the highest incidence of tickborne diseases.

Figure 21: North Dakota Tickborne Diseases Case Counts by Year, 2006-2015



The median age of cases of tickborne disease was 42 years (range: 6-70 years). Persons aged 10-14 had the highest age-specific incidence rate (13.7 cases per 100,000 people). Twenty-eight (60%) cases were male, and eleven cases (23%) were hospitalized. Of the 47 reported cases of tickborne diseases in 2015, the majority of cases (70%) were Lyme disease **(Figure 22)**.

Figure 22: North Dakota Tickborne Diseases Case Counts and Incidences, 2015

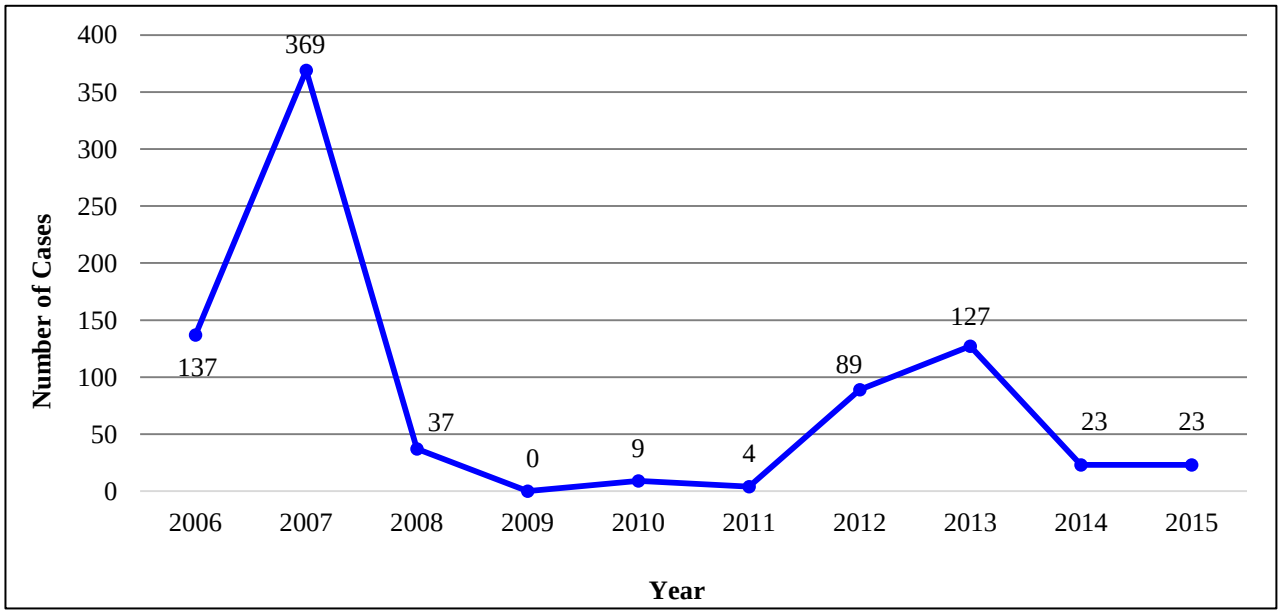


West Nile Virus (WNV)

In 2015, 23 cases of WNV infection were reported to the NDDoH, which was equal to the number of cases reported in 2014 (**Figure 23**). Statewide, WNV incidence was 3.0 cases per 100,000 people in 2015. Thirteen counties reported cases, with McLean (61.6 cases per 100,000 people), Burke (43.3 cases per 100,000 people) and Dickey (19.6 cases per 100,000 people) having the highest incidence of WNV.

The median age of WNV cases was 48 years (range: 8-79 years). Persons aged 30-34 had the highest age-specific incidence rate (7.3 cases per 100,000 people). Sixteen (70%) of the reported cases were male, and eight (35%) cases were hospitalized. There were 10 cases of neuroinvasive disease, and 13 cases of non-neuroinvasive disease. One case was fatal.

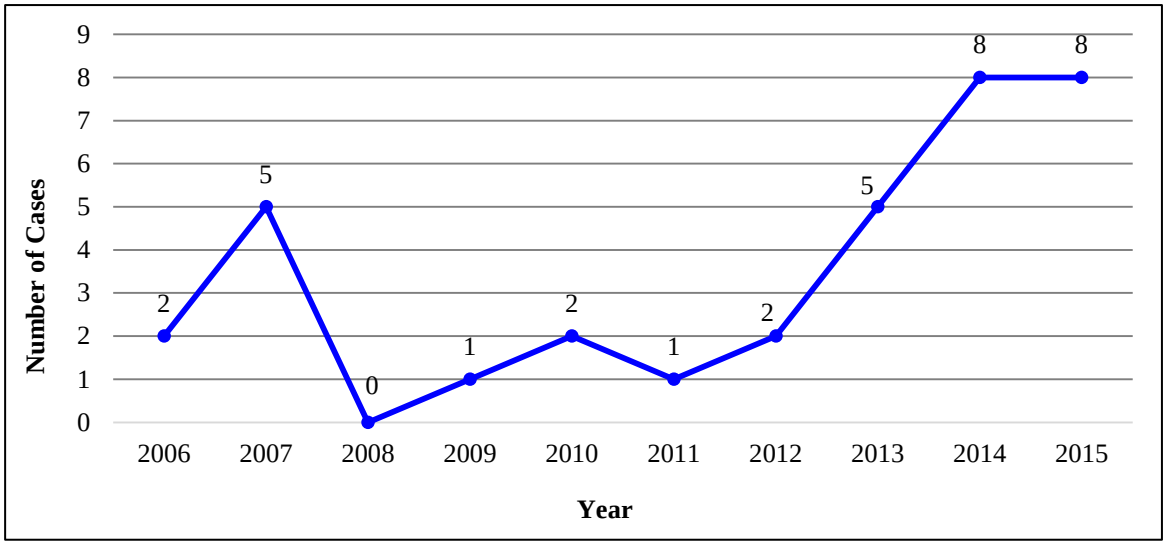
Figure 23: North Dakota West Nile Virus Case Counts by Year, 2006-2015



Other Arboviral Diseases (Chikungunya, Dengue, Malaria, Zika)

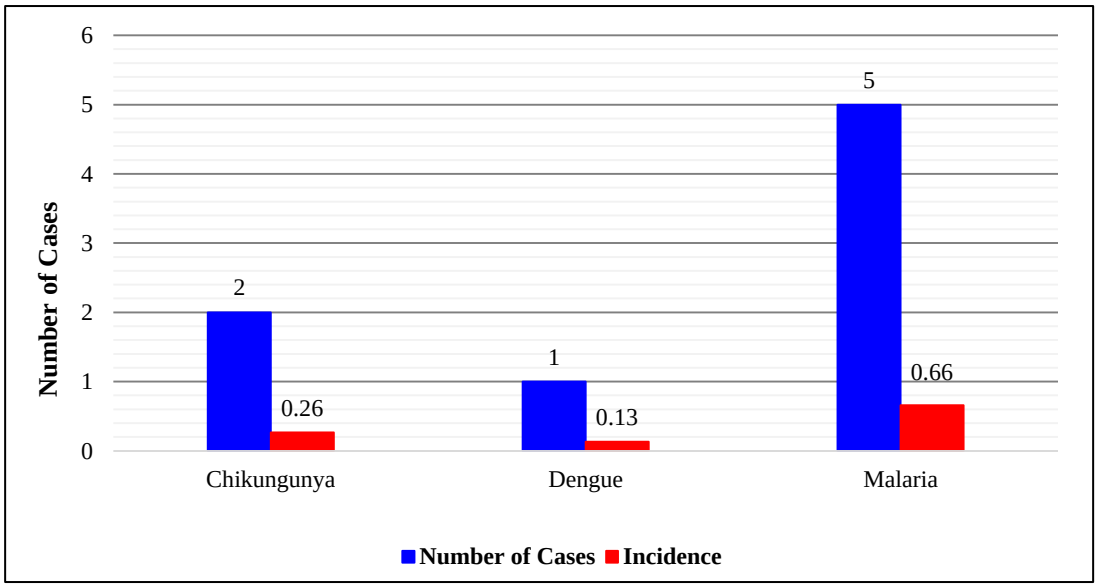
In 2015, eight cases of other arboviral diseases were reported to the NDDoH, which was equal to the number of cases reported in 2014 (**Figure 24**).

Figure 24: North Dakota Other Arboviral Diseases Case Counts by Year, 2006-2015



Statewide, the incidence of other arboviral diseases was 1.1 cases per 100,000 people in 2015. Six counties reported cases, with Stutsman (4.7 cases per 100,000 people), Williams (2.8 cases per 100,000 people), and Cass (1.7 cases per 100,000 people) having the highest incidence of other arboviral diseases.

Figure 25: North Dakota Other Arboviral Diseases Case Counts and Incidences, 2015

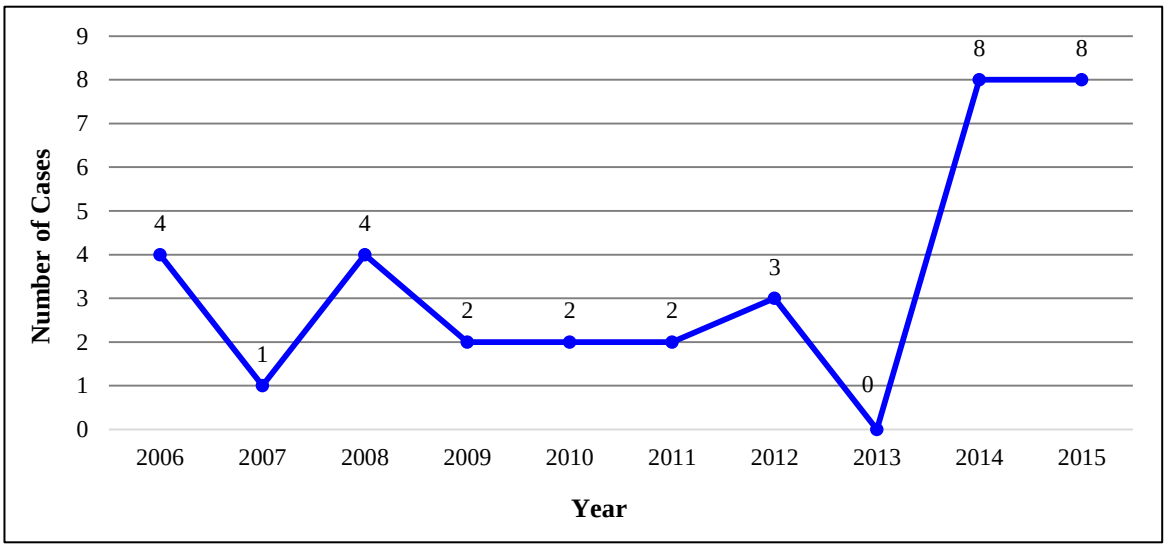


The median age of other arboviral disease cases was 31 years (range: 23-61 years). Persons aged 30-34 had the highest age-specific incidence rate (5.5 cases per 100,000 people). Six (75%) of the reported cases were male, and two cases (25%) were hospitalized. There were no Zika virus disease cases reported in 2015.

Other Zoonotic Diseases (Brucellosis, Hantavirus, Tularemia)

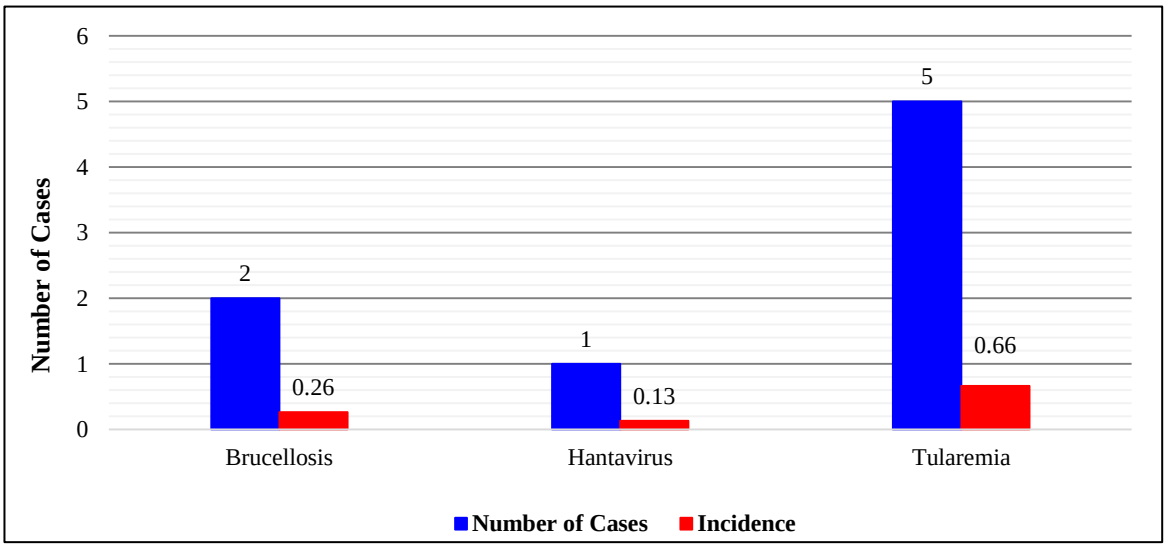
In 2015, eight cases of other zoonotic diseases were reported to the NDDoH, which was equal to the number of cases reported in 2014 (**Figure 26**).

Figure 26: North Dakota Other Zoonotic Diseases Case Counts by Year, 2006-2015



Statewide, other zoonotic disease incidence was 1.1 cases per 100,000 people in 2015. Six counties reported cases, with LaMoure (24.2 cases per 100,000 people), Benson County (14.8 cases per 100,000 people), and Morton (6.6 cases per 100,000 people) having the highest incidence of other zoonotic diseases. Most of the other zoonotic diseases reported were tularemia (**Figure 27**).

Figure 27: North Dakota Other Zoonotic Disease Case Counts and Incidences, 2015

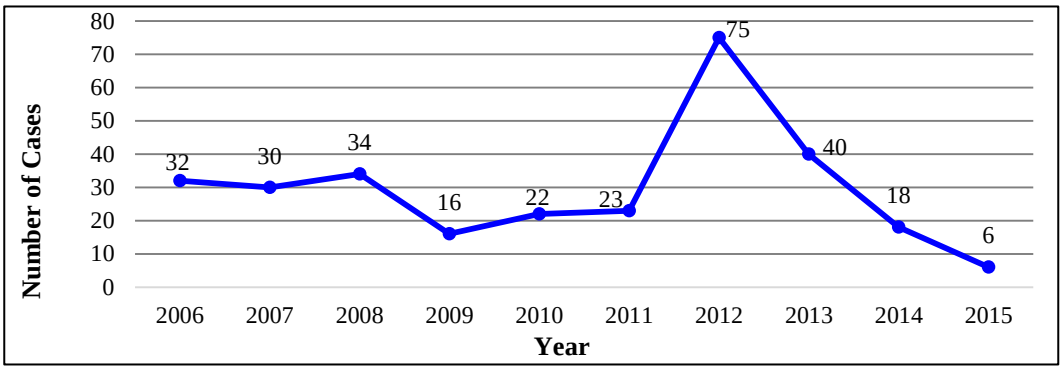


The median age of cases of other zoonotic diseases was 42 years (range: 1-94 years). Persons aged 35-39 years had the highest age-specific incidence rate (4.5 cases for every 100,000 people). Five (63%) cases were female, and four cases (50%) were hospitalized.

Animal Rabies

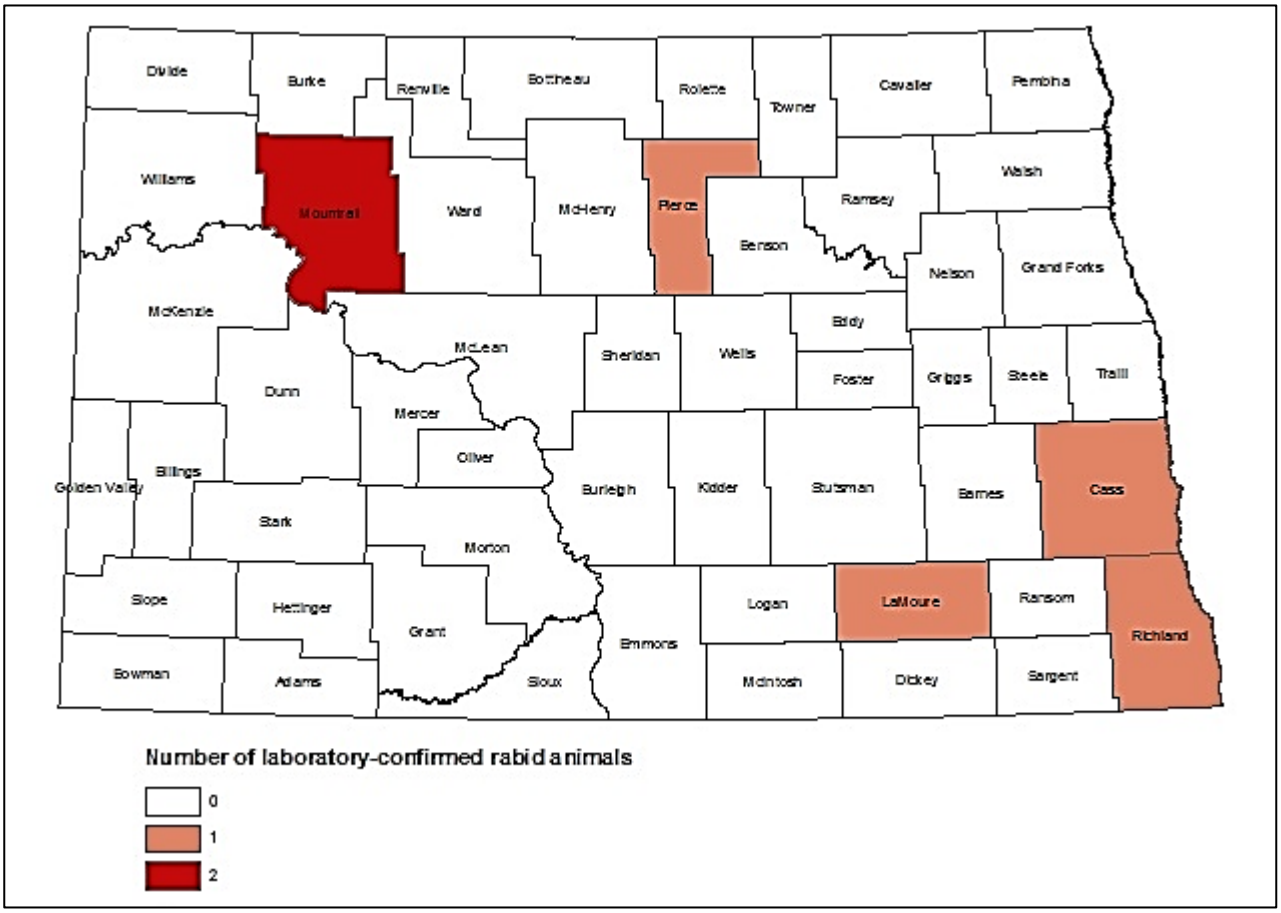
In 2015, six animals tested positive for rabies out of a total 420 animals tested, a decrease from the 18 animals that tested positive in 2014 (**Figure 28**).

Figure 28: Cases of Animal Rabies in North Dakota by Year, 2006-2015



Animals from five counties tested positive (**Map 1**). There were no human cases of rabies in 2015. Most of the reported animal cases were bats (3), while other animals that tested positive included a cow, a horse, and a skunk.

Map 1: Counties with Cases of Animal Rabies in North Dakota, 2015



Carbapenem-resistant Enterbacteriaceae

Faye Salzer, Healthcare Associated Infection Coordinator

Carbapenem-resistant Enterobacteriaceae (CRE) are a family of bacteria that are difficult to treat because they have high levels of resistance to antibiotics. *Klebsiella* species and *Escherichia coli (E. coli)* are examples of Enterobacteriaceae, a normal part of the human gut bacteria that can become carbapenem resistant.
One of the more common ways that Enterobacteriaceae become resistant to carbapenems is through the production of *Klebsiella pneumoniae* carbapenemase (KPC) enzyme. KPC breaks down carbapenems making them ineffective. The genes that code for KPC are on a highly mobile genetic element that can be transmitted from one bacterium to another thereby spreading resistance.

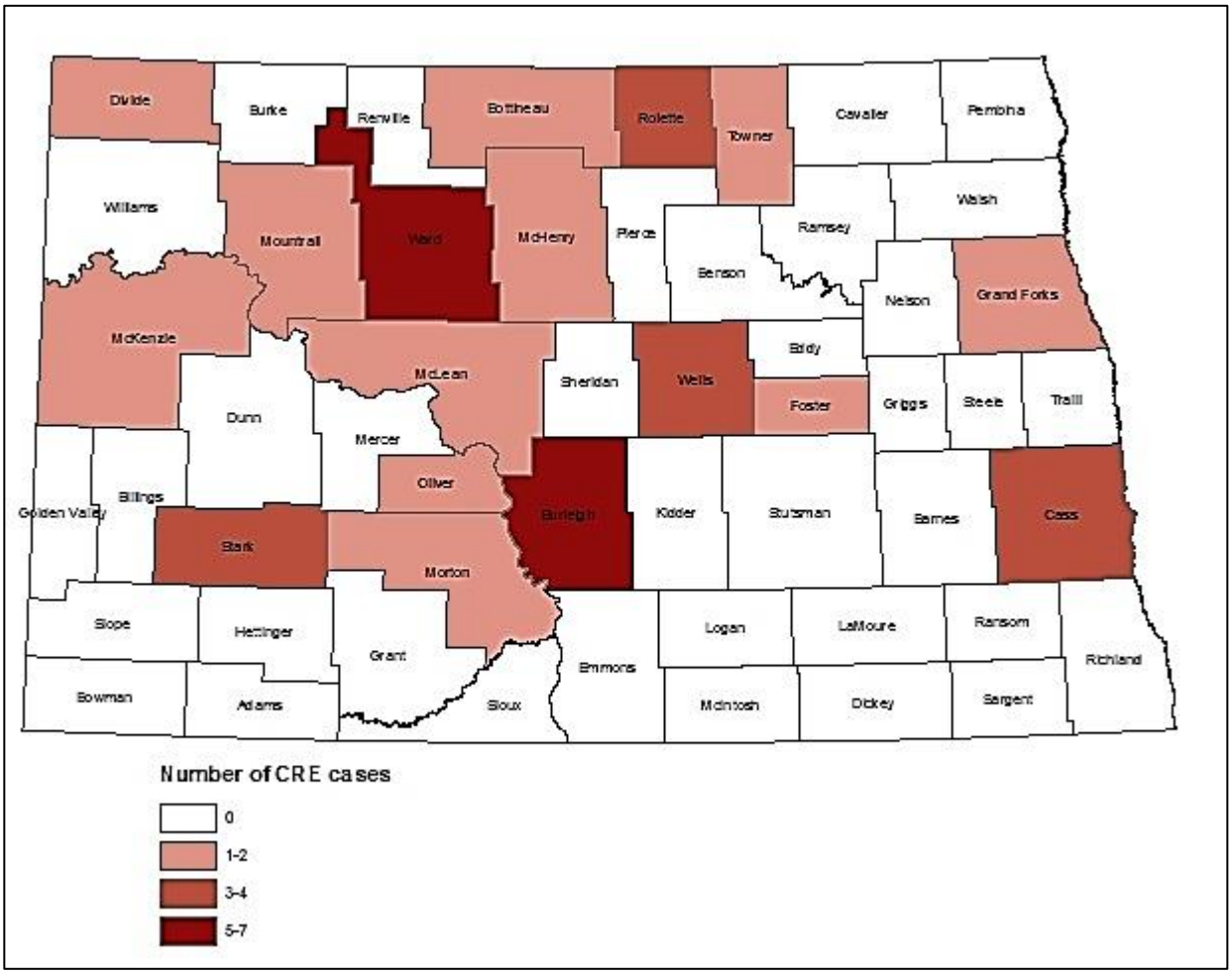
CRE are defined as Enterobacteriaceae that are resistant to one of the following carbapenems:

- Doripenem
- Ertapenem
- Meropenem
- Imipenem

Enterobacteriaceae testing positive for carbapenemase via a modified Hodge test, Carba-NP test or identified as a KPC enzyme producer, through PCR testing, or other documentation that the isolate possess a carbapenemase are also considered CRE cases.

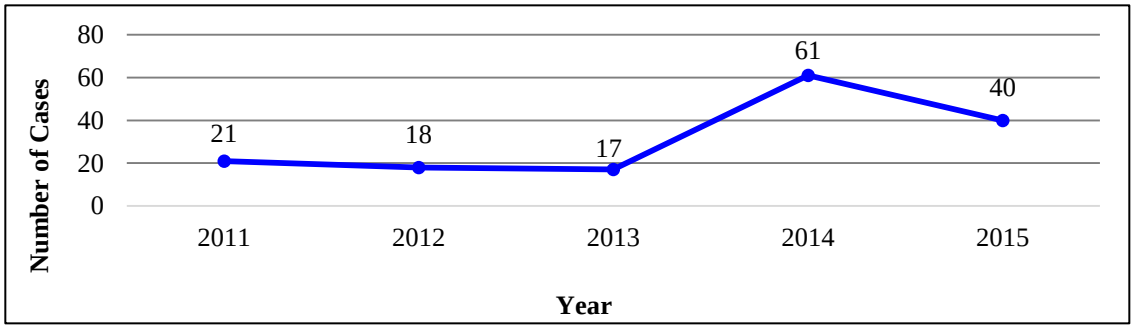
The emergence and dissemination of carbapenem resistance among Enterobacteriaceae in the United States represent a serious threat to public health. These organisms are associated with high mortality rates and have the potential to spread in healthcare settings.

Map 2: CRE Case Counts in North Dakota by County, 2015



In 2015, 40 cases of CRE infections were reported to the NDDoH, a 34.43% decrease from the 61 cases reported in 2014. In 2014, there was additional CRE testing performed due to a CRE cluster investigation, which likely resulted in additional cases being identified. Statewide in North Dakota, CRE infection incidence was 5.3 cases per 100,000 people in 2015. Seventeen counties reported cases in 2015, compared to 19 counties in 2014, with Bottineau, Divide, Foster, and Towner counties noted as new counties identifying cases in 2015. The counties with the highest incidence of CRE cases were Oliver (54.2 cases per 100,000 people), Towner (44.0 cases per 100,000 people), and Divide (40.8 cases per 100,000 people).

Figure 29: North Dakota CRE Case Counts by Year, 2011-2015



HIV/STD/TB/
Viral Hepatitis Programs

The NDDoH HIV program is divided in three sections: HIV Surveillance, HIV Prevention, and Ryan White Program Part B.

The HIV Surveillance program summarizes data to help the NDDoH to:

- Monitor the incidence and estimated prevalence of HIV/AIDS in the state
- Assess the risks for HIV infection and develop effective HIV prevention strategies
- Develop surveillance methods to allow for a more current estimate and characterization of HIV/AIDS risks and needs
- Justify necessary federal and state funding to support continued HIV/AIDS prevention and surveillance activities

The HIV Prevention program key activities include:

- Providing information and materials on HIV transmission and how to protect individuals from contracting HIV
- Providing testing to those at risk for contracting HIV
- Collaborate and support the Community Planning Group in identifying HIV prevention needs and targeted intervention in identified priority populations

The Ryan White Part B program serves to:

- Address the unmet health needs of persons living with HIV disease
- Optimize health outcomes by funding health care and support services to enhance health care access and retention in care
- Provide case management to link clients to appropriate resources

The NDDoH STD program key activities include:

- Monitoring the incidence and estimated prevalence of STDs in the state; diseases that are monitored include chlamydia, gonorrhea, and syphilis
- Utilizing surveillance data to better characterize STD risks and identify disproportionately affected populations
- Assessing the risks for STD infection and develop effective STD prevention programs; these programs include partner notification and linkage to care
- Justifying necessary federal funding to support continued STD prevention, services and surveillance activities

The NDDoH TB Prevention and Control Program collaborates with clinicians and local public health units to ensure that persons with TB receive effective and timely treatment and that contact investigations are performed to minimize the spread of TB. TB data is summarized to help the NDDoH to:

- Monitor the incidence and estimated prevalence of TB in the state
- Utilize surveillance data to better characterize the risks and needs of people infected with TB in North Dakota
- Assess the risks for TB infection and develop effective TB prevention programs
- Justify necessary federal and state funding to support continued TB prevention, services, and surveillance activities

The NDDoH Viral Hepatitis program key activities include:

- Monitoring the incidence and estimated prevalence of viral hepatitis in the state; diseases that are monitored include hepatitis A, hepatitis B and hepatitis C
- Educating healthcare professionals that serve individuals at risk for viral hepatitis and target populations who are at risk for viral hepatitis
- Collaborating with the HIV program to integrate viral hepatitis testing into the counseling, testing and referral (CTR) program for those at risk for viral hepatitis infections; these individuals are also offered hepatitis A and B vaccinations
- Develop referral services for medical care and case management for chronically infected persons

HIV Program

Dee Pritschet, HIV Surveillance Coordinator

HIV/AIDS

North Dakota traditionally ranks near the bottom for incident cases each year of human immunodeficiency virus (HIV/AIDS) in the United States. In 2015, the incident case rate was of 4.0 per 100,000 people.

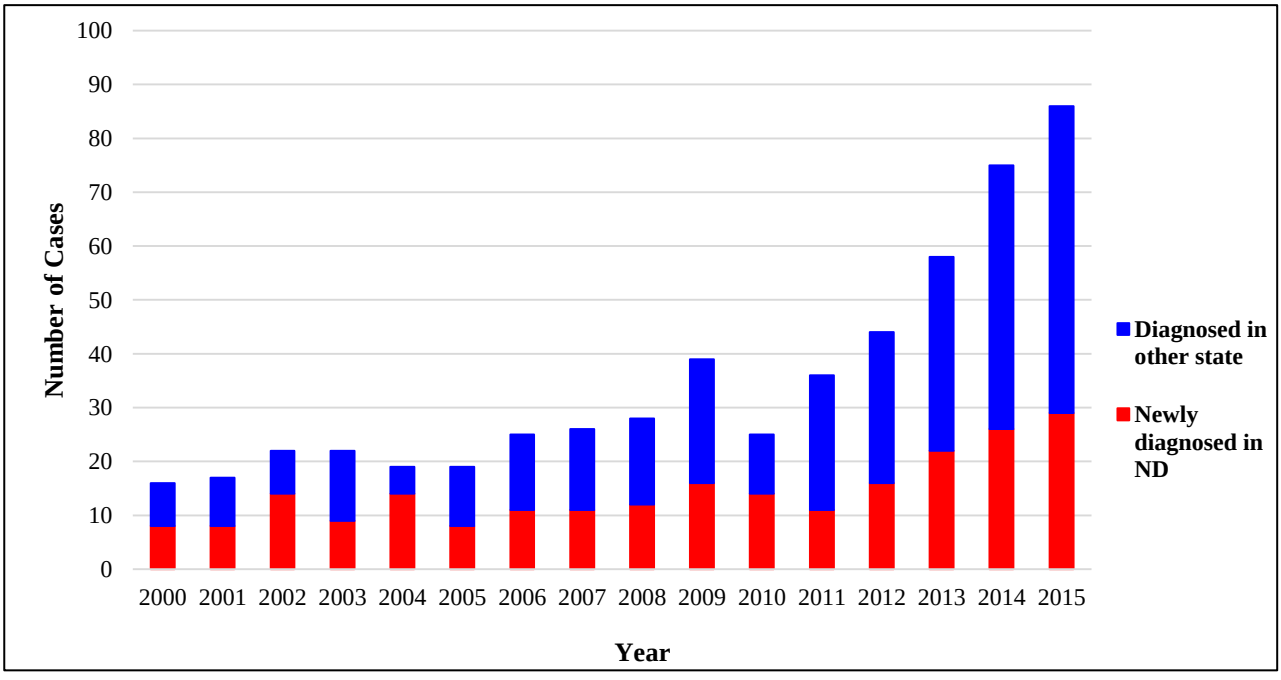
In 2015, 86 HIV/AIDS cases were reported to the NDDoH. This count includes cases being diagnosed for the first time in the state and cases previously diagnosed elsewhere who moved to North Dakota during the year.

In 2015, 30 North Dakota residents were diagnosed with HIV/AIDS and reported to the NDDoH. Eleven of those newly diagnosed HIV cases were advanced enough to meet the case definition for AIDS at the time of diagnosis. Seventy-seven percent of HIV/AIDS cases reported in 2015 were male. Males accounted for 80% of estimated new HIV infection in the United States in 2014.

Cumulative (2000-2015) HIV/AIDS Cases

HIV and AIDS have been reportable conditions in North Dakota since 1984. The cumulative reported infections as of December 31, 2015, stands at 805 HIV/AIDS cases.

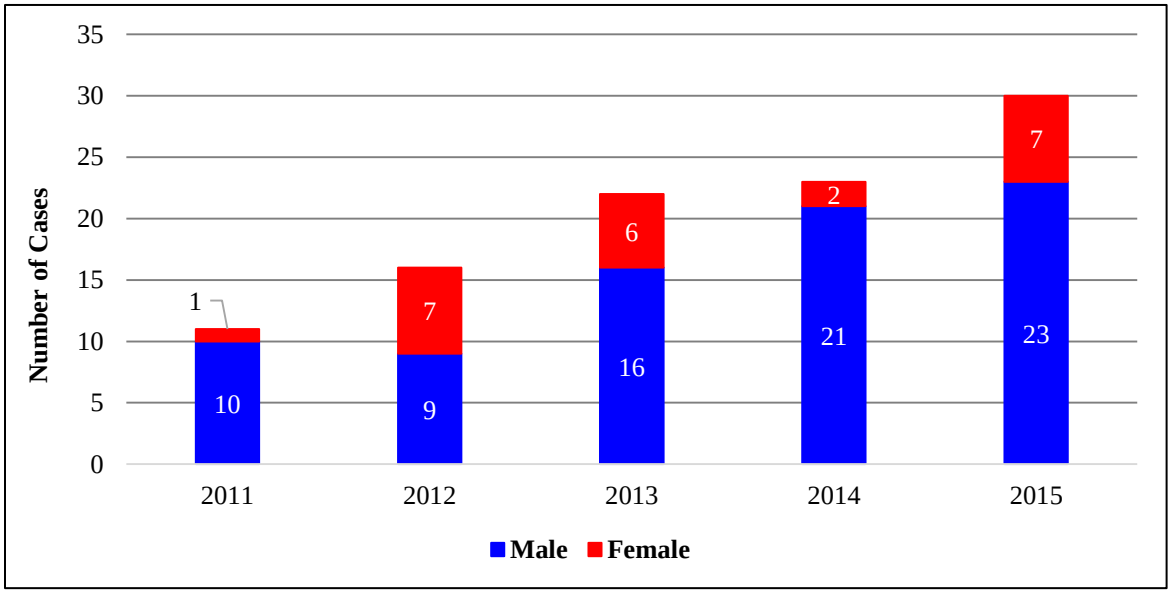
Figure 30: HIV/AIDS diagnosed in North Dakota and HIV/AIDS previously diagnosed in other states by year, 2000-2015



HIV/AIDS Incidence: 2011-2015

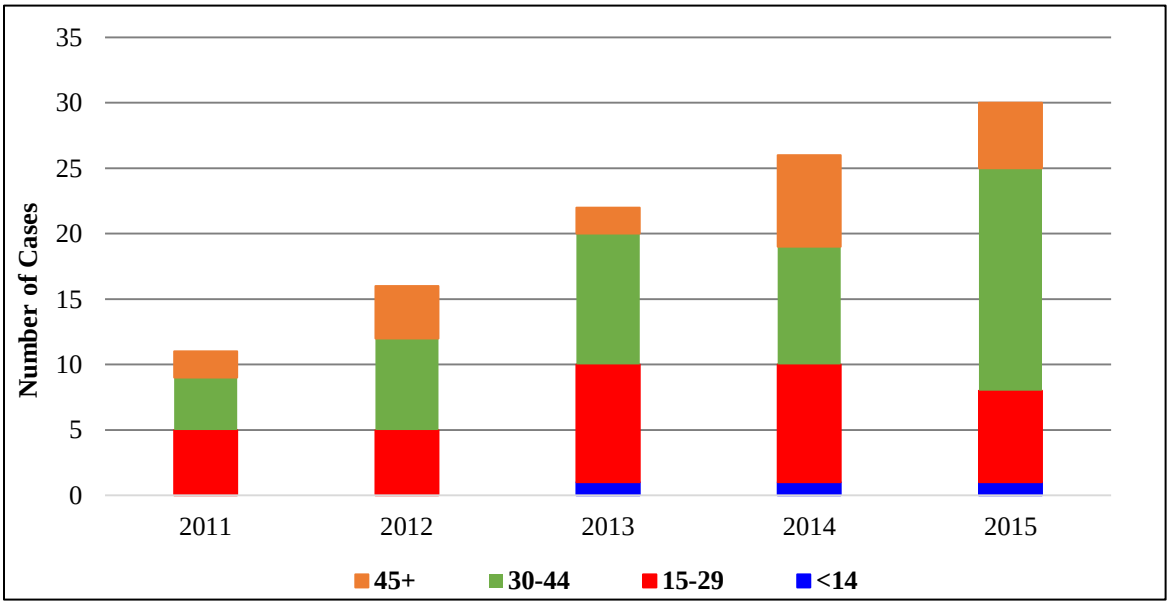
HIV/AIDS incidence refers to cases that were diagnosed for the first time in North Dakota within a given time frame. AIDS cases reported in this section met the criteria for AIDS at first diagnosis. From 2011 to 2015, 105 HIV/AIDS cases were diagnosed in North Dakota. Thirty percent met the criteria for AIDS at time of diagnosis, while the remaining 70% were diagnosed as an HIV infection. Seventy-four percent were male and 26%were female.

Figure 31: HIV/Aids Incident Cases by Gender, 2011-2015



The age groups of HIV/AIDS cases diagnosed for the first time in North Dakota between 2011 and 2015 are shown in **Figure 32**. Nearly half (49%) of new HIV/AIDS diagnoses in North Dakota are in individuals ages 20-34. The minimum age was seven years and the maximum age was 64 years.

Figure 32: Incidence Age of HIV/AIDS cases diagnosed in N.D. 2011 – 2015



Racial and ethnic minorities disproportionately continue to be affected by HIV in the United States and North Dakota. Black/African Americans represent approximately 12% of the United States population, but accounted for an estimated 44% of new HIV infections in 2010. Thirty-five percent of HIV/AIDS cases diagnosed in North Dakota between 2011 and 2015 were Black/African American, while that population made up only two percent of North Dakota in the 2014 census.

Figure 33: Race/Ethnicity for cases diagnosed in 2011-2015

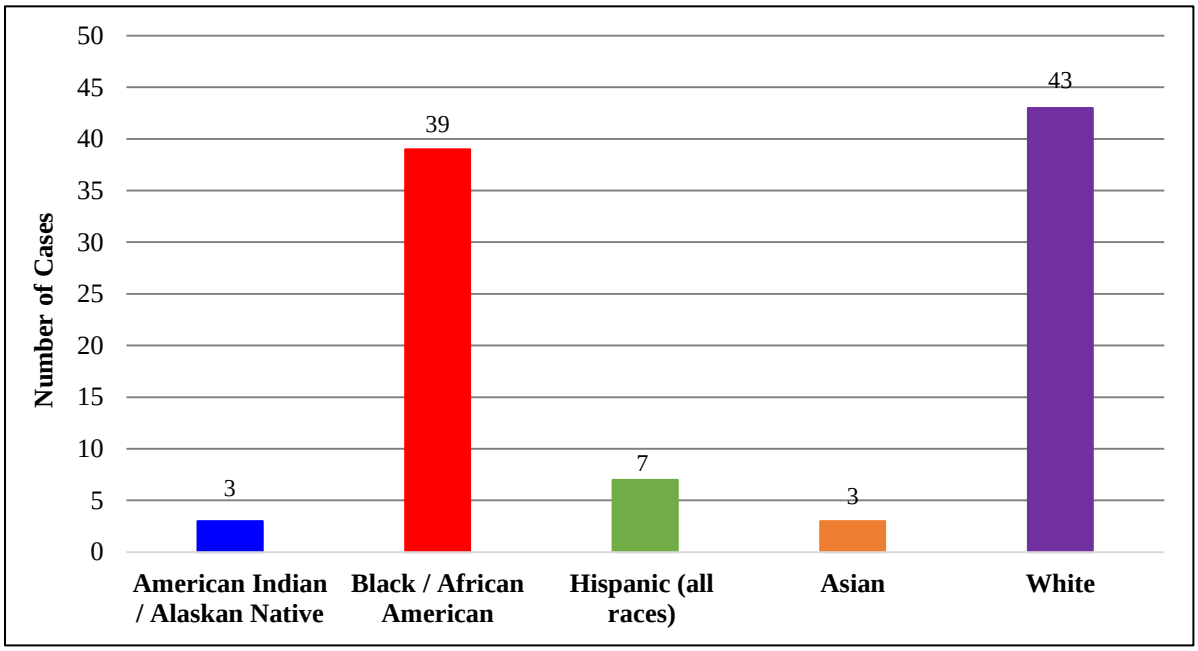
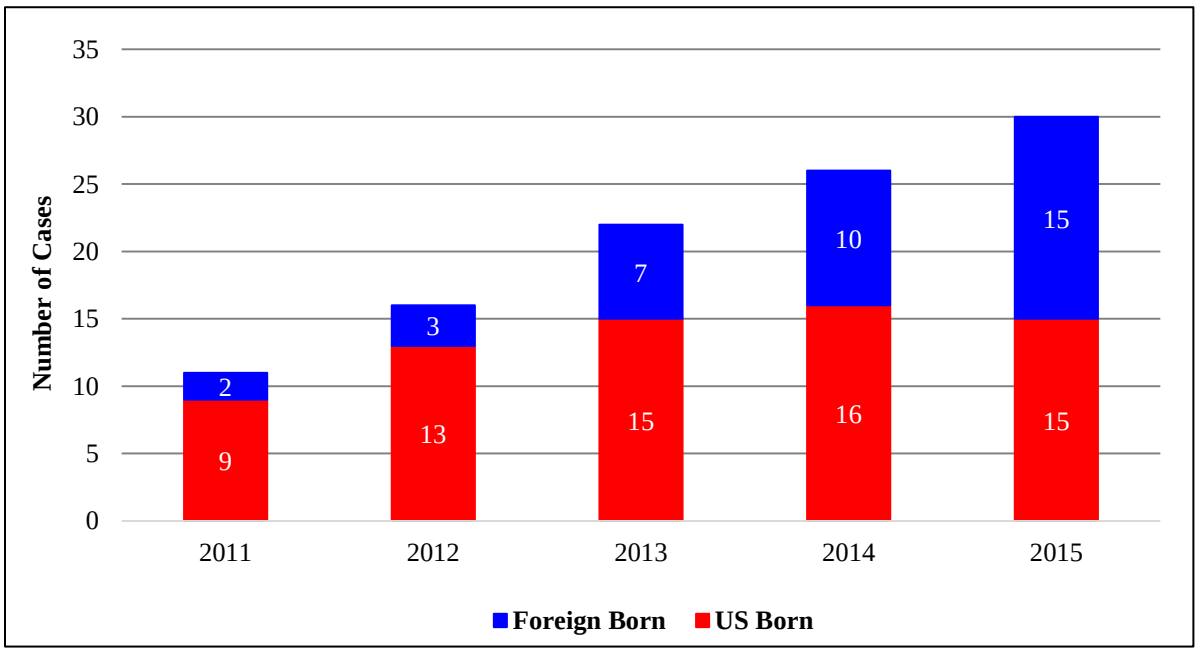
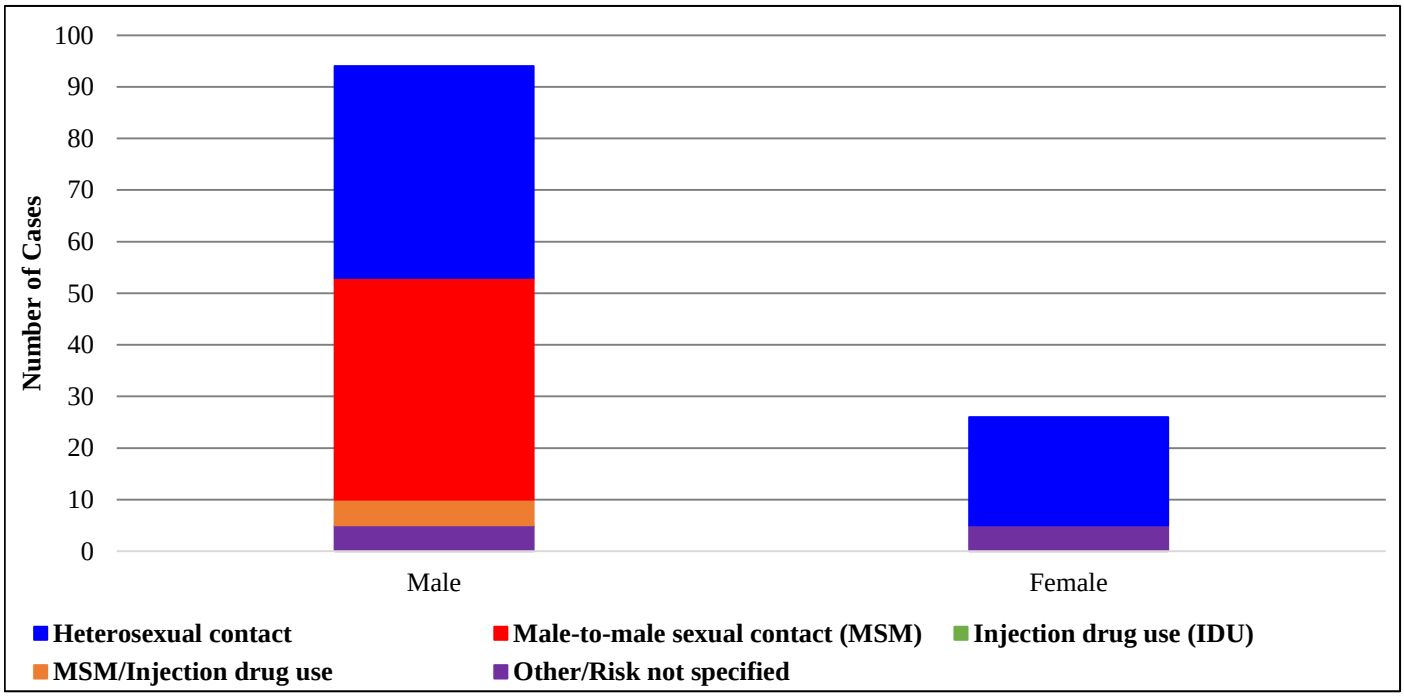


Figure 34: Newly reported HIV/AIDS cases in North Dakota by country of birth, 2011-2015

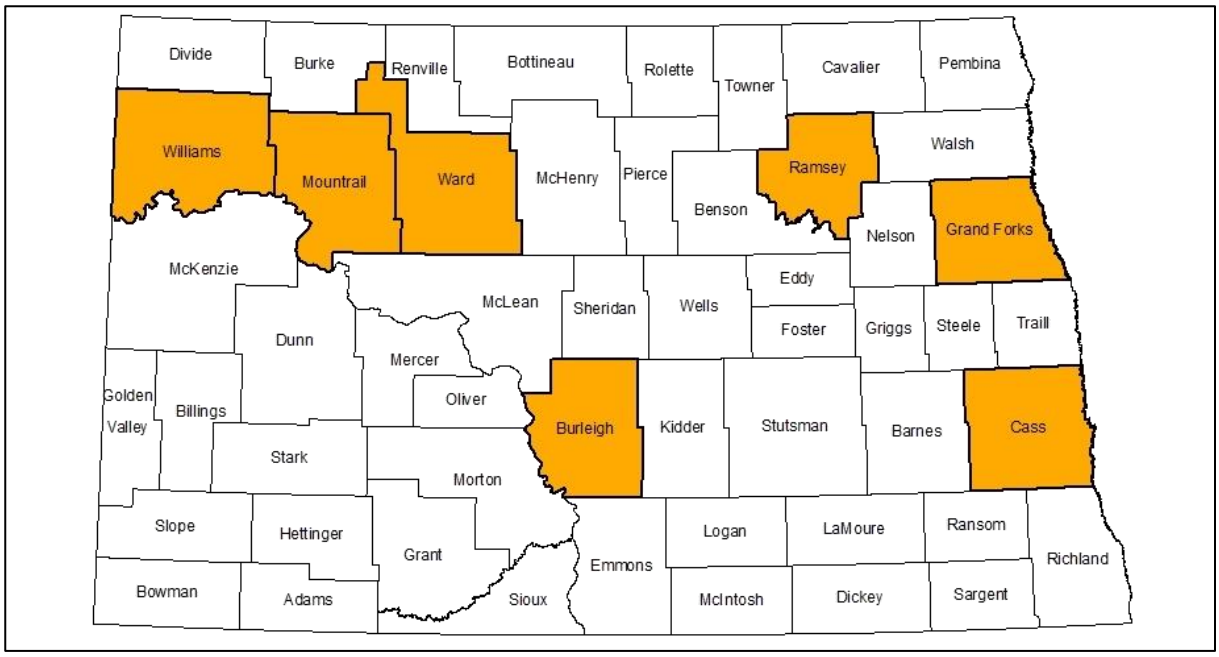


Male-to-male sexual contact continued to be the most frequently self-reported risk factor among males. Fifty-one percent of cases diagnosed between 2011 and 2015 reported male-to-male sexual contact. In females, heterosexual contact was the most frequent risk factor. There were no self-reports of injection drug use among females during this time period. Risk factors of HIV/AIDS cases diagnosed in North Dakota for 2011-2015 separated by gender are shown in (**Figure 35)**.

Figure 35: Risk factors of HIV/AIDS cases diagnosed in ND by Gender, 2011-2015

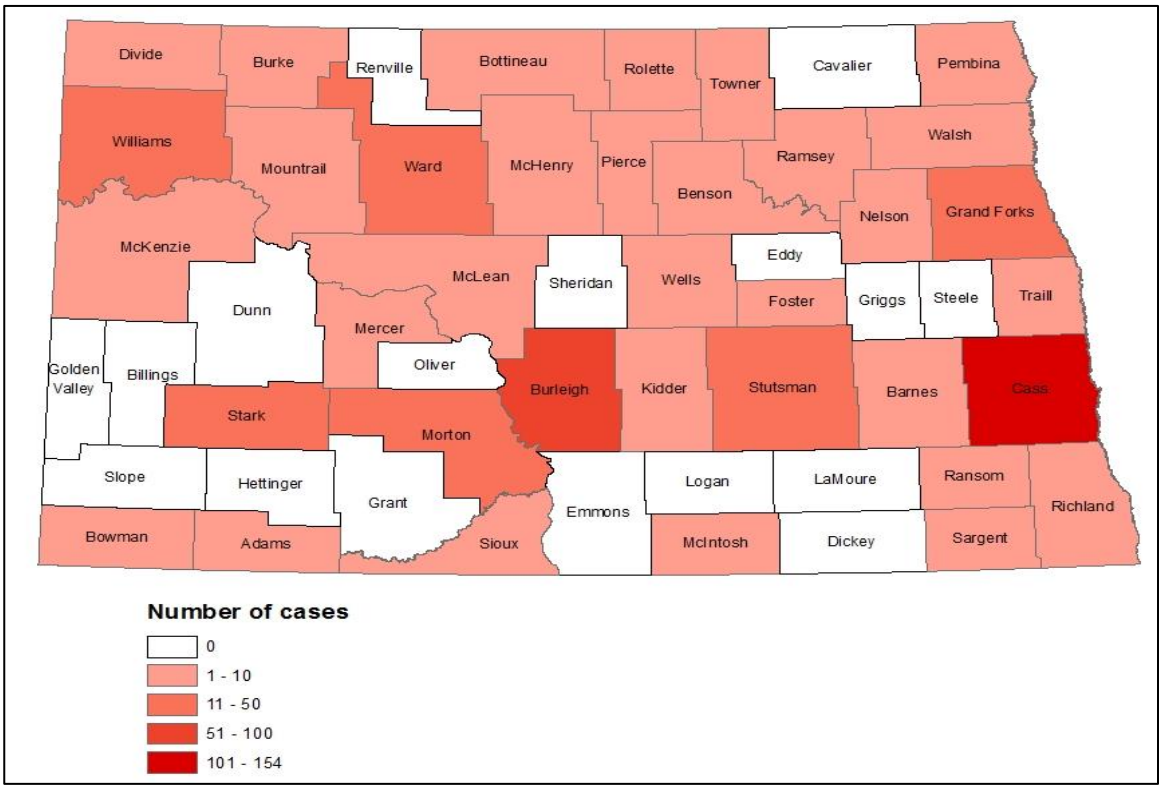


Map 3: Geographic location of newly identified HIV/AIDS cases diagnosed in 2015



This map shows counties that had at least one newly identified case of HIV/AIDS in 2015.

Map 4: Geographic location of HIV/AIDS case currently living in North Dakota, 2015



This map shows the county of residence of the 424 known HIV/AIDS cases in North Dakota as of December 31, 2015.

Tuberculosis

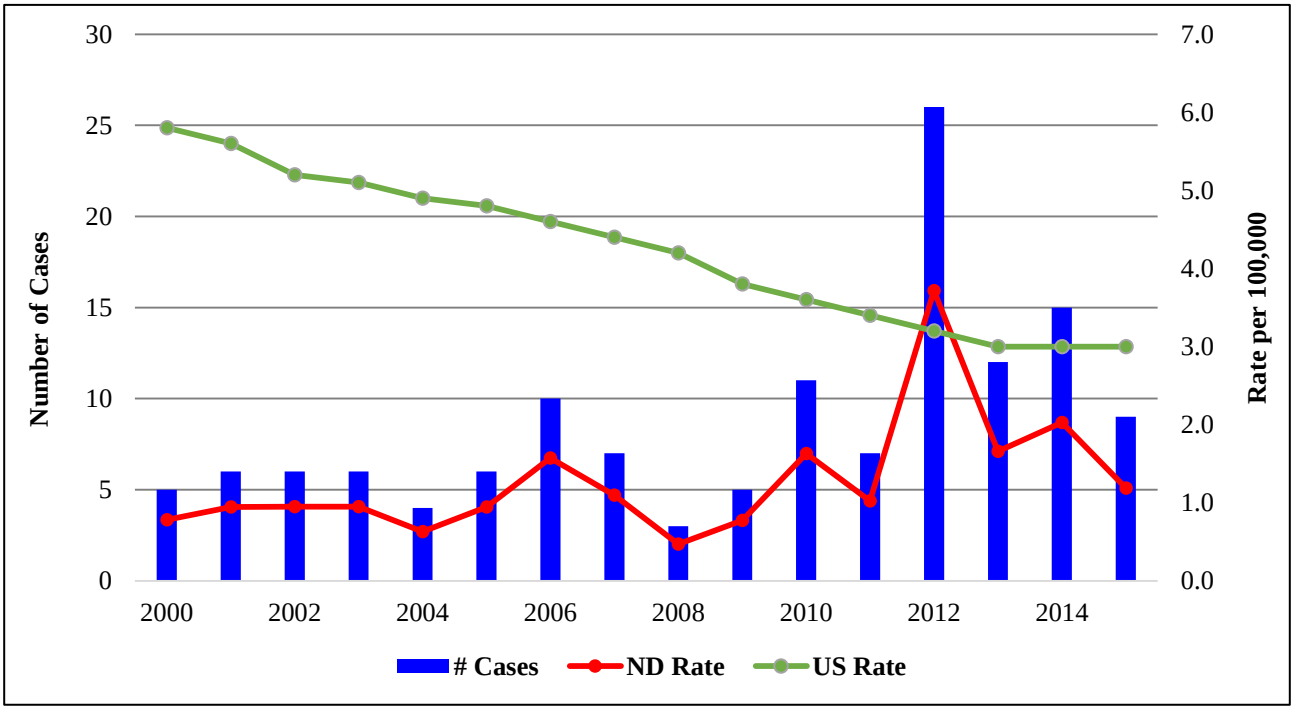
Dee Pritschet, TB Coordinator

Tuberculosis (TB)

In 2015, there were nine cases (1.2 cases per 100,000 people) of infectious tuberculosis (active) identified and 544 cases of tuberculosis infection only (latent) in North Dakota. In 2015, the number of reported TB cases in the United States increased for the first time in 23 years, for a total of 9,563 cases of infections tuberculosis (3.0 cases per 100,000 people).

North Dakota's incidence rate historically has been lower than the national rate; the North Dakota incidence rate of 1.2 cases per 100,000 people in 2015 is below the United States rate of 3.0 cases per 100,000 people. (**Figure 36**).

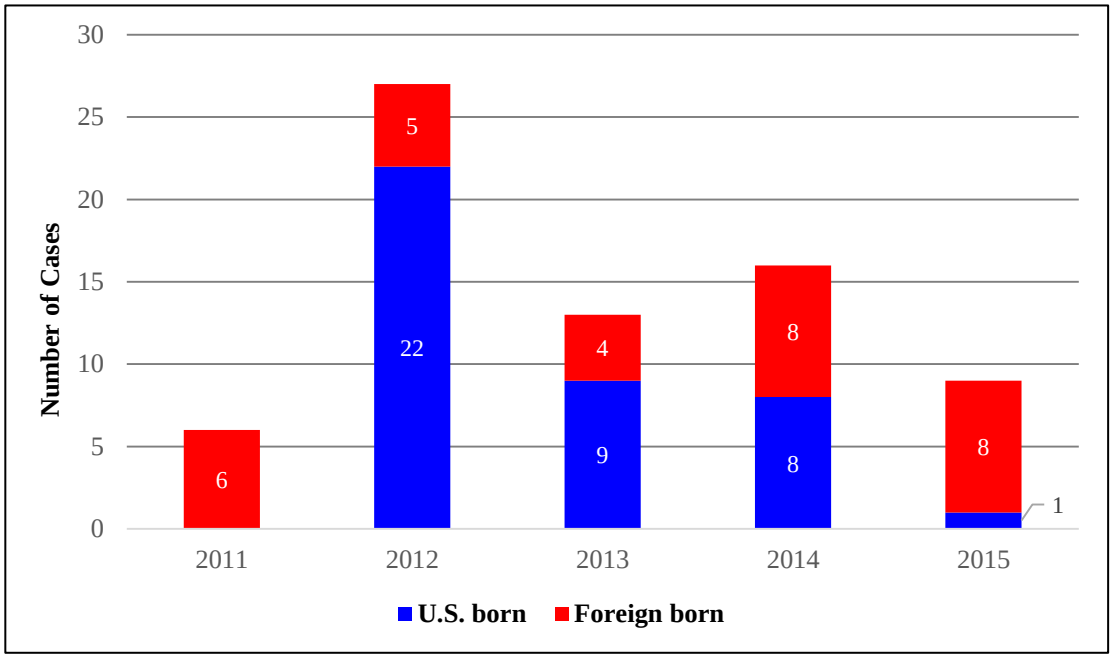
Figure 36: North Dakota Cases: U.S. and ND Tuberculosis Disease Rates, 2000–2015



5-Year Trends

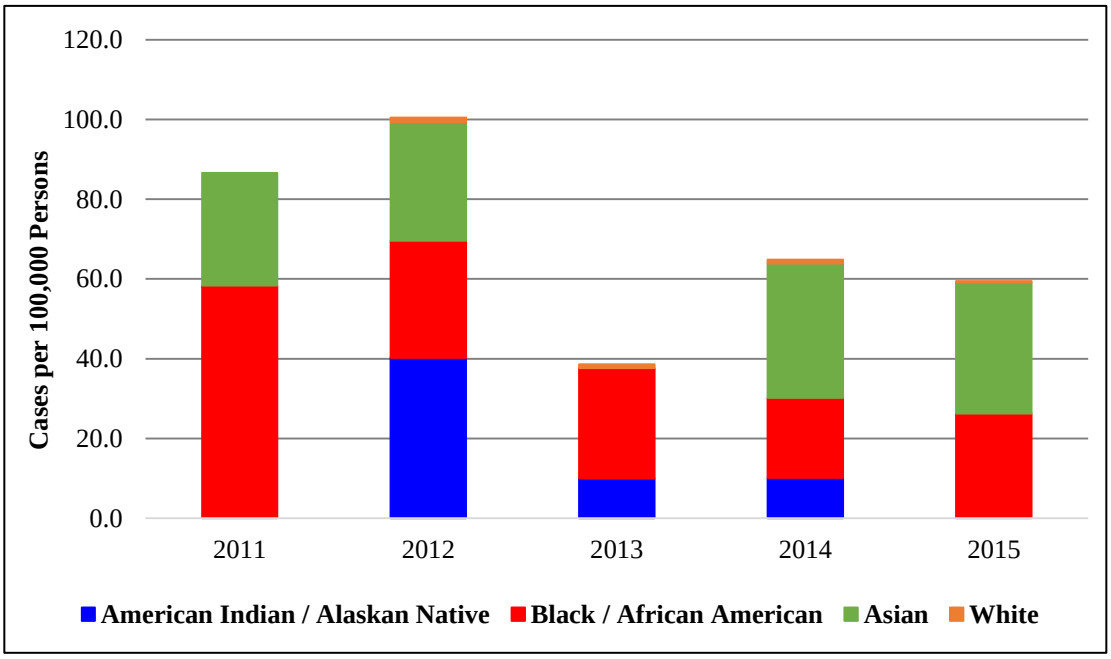
Between 2011 and 2015, 71 cases of active TB were reported in North Dakota; 40 of those cases were United State born (57%), and 31 cases were foreign born (43%). In 2015, 89% of reported TB cases in North Dakota occurred among foreign-born persons. During the five-year time period, there were 40 male cases and 31 female cases. The youngest individual during this five-year time period was two years old, and the oldest was 92. The average age was 37 years old.

Figure 37: Number of active TB cases reported in North Dakota, 2011-2015



TB data from the previous five years shows that individuals of racial and ethnic minorities were disproportionately affected by TB. North Dakota is a low incidence state for TB, with the case rates well below the national rates for TB. In 2015, the North Dakota incident rate for whites was 0.3 per 100,000 people, which was lower than the United States rate of 0.7 per 100,000 people. The incident rate among American Indian/Alaskan Natives reduced from 10.0 per 100,000 individuals in 2014 to zero in 2015. The rate among Black/African Americans increased from 20 to 26.8 per 100,000 individuals in 2015, and Asian incidence rates were unchanged from last year at 33.7 cases per 100,000 individuals (**Figure 38**).

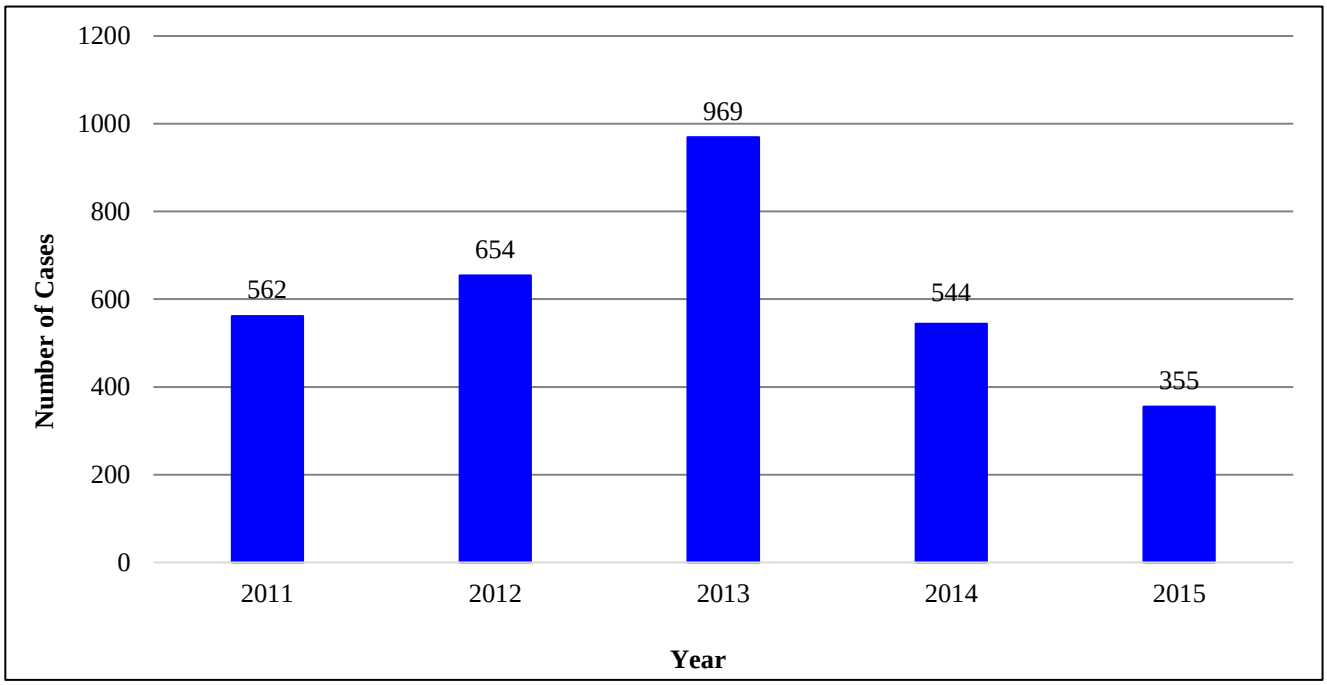
Figure 38: Tuberculosis Cases by Race/Ethnicity, North Dakota, 2011-2015



Latent Tuberculosis Infection (LTBI)

An estimated one-third of the global population is currently infected with TB, most of these being LTBI. Individuals with LTBI are not infectious, and do not have symptoms of TB disease. The number of latent tuberculosis infections reported in North Dakota over the past five years is shown in **Figure 39**.

Figure 39: Reported Cases of LTBI North Dakota, 2011-2015



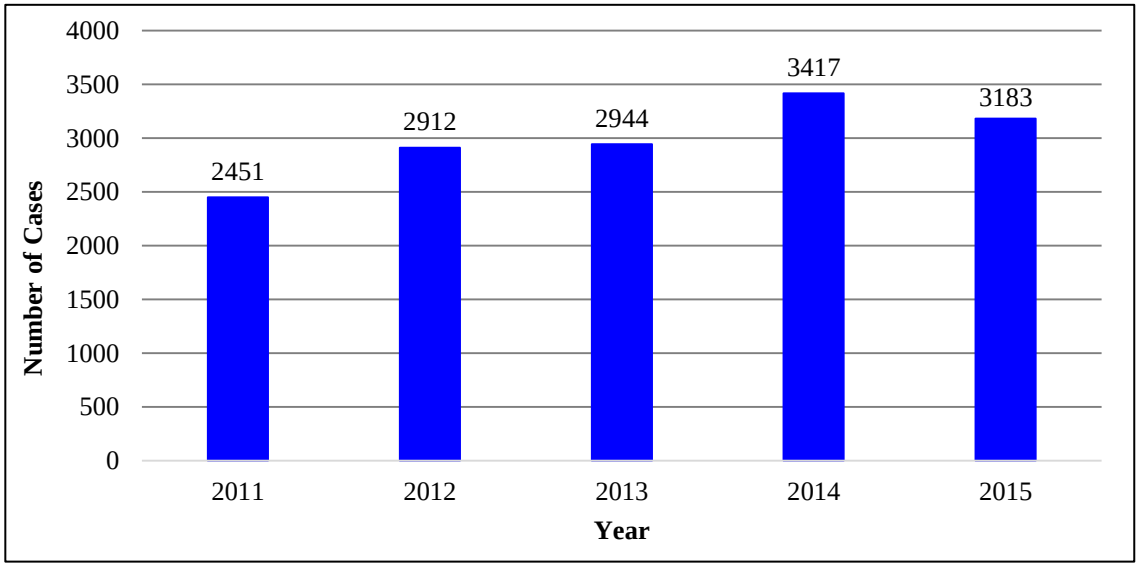
Sexually Transmitted Diseases

Sarah Weninger, STD Coordinator

Chlamydia

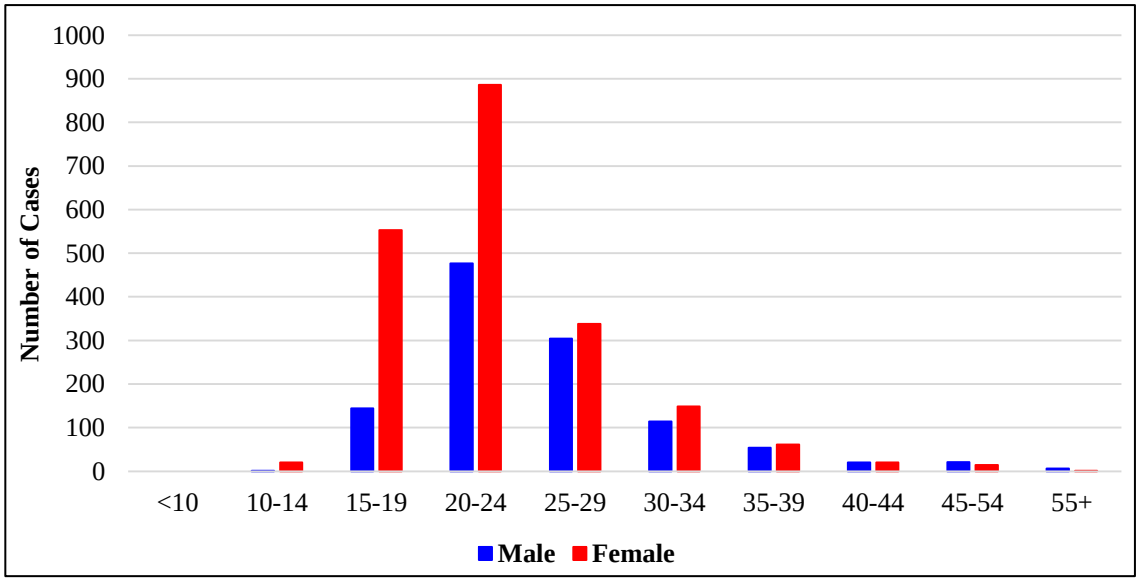
In 2015, 3,183 cases of chlamydia were reported to the NDDoH, a rate of 420.5 cases per 100,000 persons. North Dakota ranks 25th in the United States for chlamydia rates. Chlamydia cases have increased by 30% since 2011, despite a seven percent decrease in cases from 2014 to 2015 **(Figure 40)**.

Figure 40: Chlamydia Cases by Year, North Dakota, 2011-2015

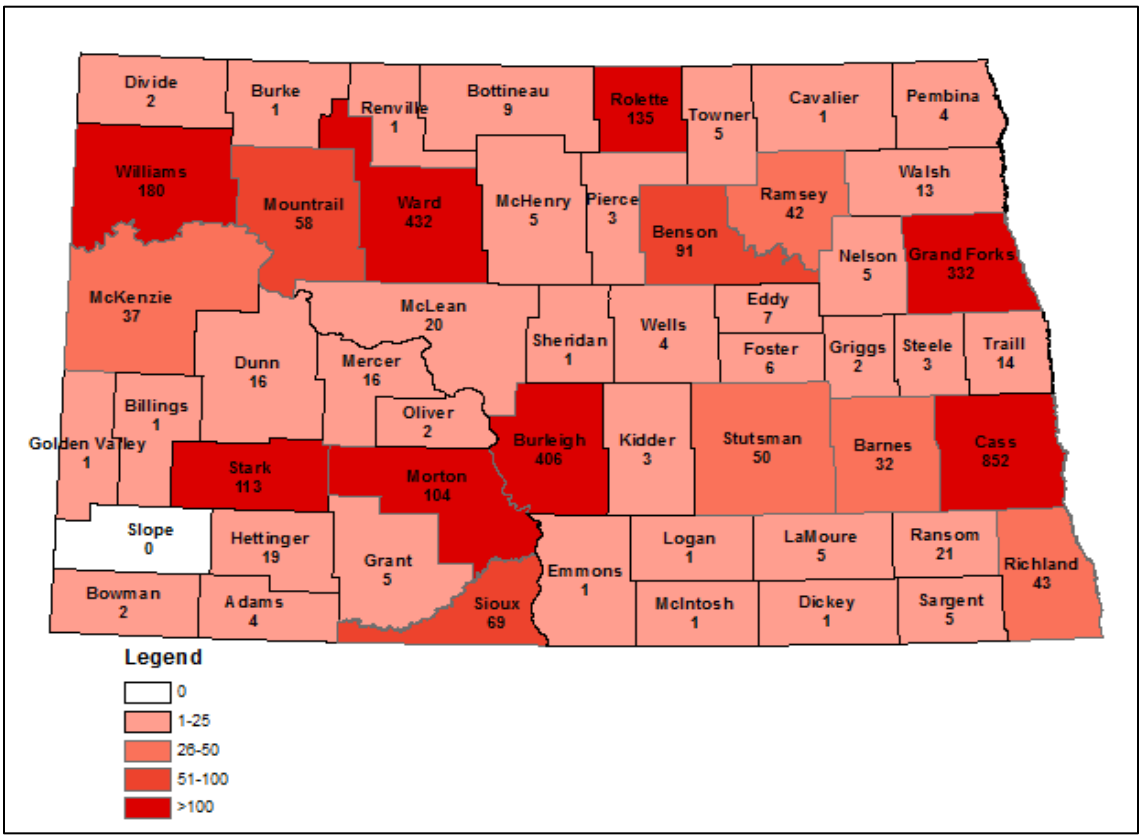


Of the cases reported in 2015, 2,042 (64%) were reported in females. Individuals ages 20-24 represented 43% of cases, and had twice as many cases as reported for ages 15-19 and 25-29 (**Figure 40**).

Figure 41: Chlamydia Cases by Age Group and Gender, North Dakota, 2015



Map 5: North Dakota Chlamydia Cases by County, 2015



In 2015, 52 of 53 counties had residents diagnosed with chlamydia. Slope County has not had a case of chlamydia since 2011. Overall incidence of chlamydia clusters near population centers. Ten counties in North Dakota had chlamydia rates higher than the overall North Dakota rate of 420.5 cases per 100,000 persons. Counties reporting the highest chlamydia rates in North Dakota are Sioux (1,556 per 100,000 people), Benson (1,288 per 100,000 people), and Rolette (922 per 100,000 people).

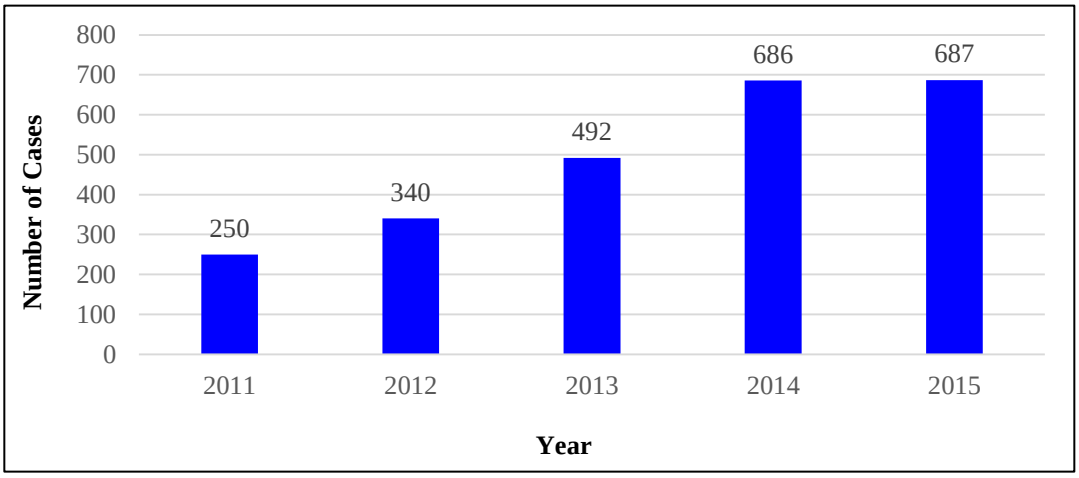
Table 2: Epi Facts of North Dakota Chlamydia Cases, 2015

How many people are being treated?	86 (2.5%) chlamydia cases were not treated and 44 cases (1.3%) did not adhere to treatment guidelines.
How many cases were interviewed?	56% of chlamydia cases were reported as being interviewed. *Note: The NDDoH only interviews pregnant women, those diagnosed with PID, and cases under 14 years of age. Interview reports are submitted from private providers on the remainder of patients.*
How many partners were tested and treated?	2,192 partners were reported to interviewers (0.34 partners/case; median of one partner). However, 65% of cases reported no sexual partners. Of reported partners, 1,169 were named for follow-up and partner services.
What are the risk factors for getting chlamydia?	10% reported sex while high or intoxicated, 10% reported having more than one sex partner in the previous 12 months, and 5% reported having anonymous sex partners.
How many were also tested for HIV?	33% of chlamydia cases were reported as being tested for HIV. All chlamydia cases are recommended to be tested for HIV at time of diagnosis.

Gonorrhea

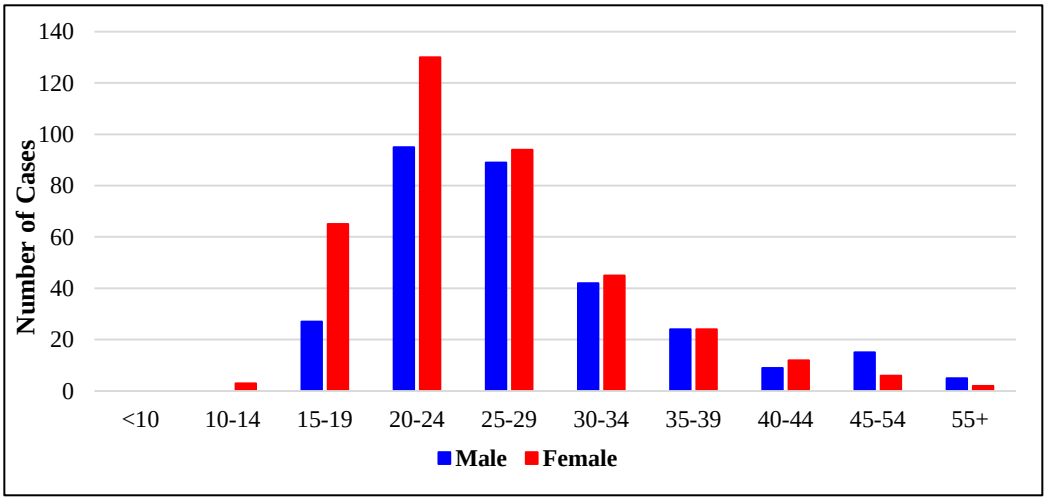
In 2015, 687 cases of gonorrhea were reported to the NDDoH, showing essentially no change from 2014 cases. This also follows at least five years of steady increases, including a 39% increase from 2013 to 2014 (**Figure 42**). The case count reported in 2015 corresponds to a rate of 91 cases per 100,000 individuals, which is a slight decrease from 2014. However, the North Dakota rate has nearly tripled over the past five years, whereas the United States rate has increased 8.2% from 2009 to 2013.

Figure 42: Gonorrhea Cases by Year, North Dakota, 2011-2015



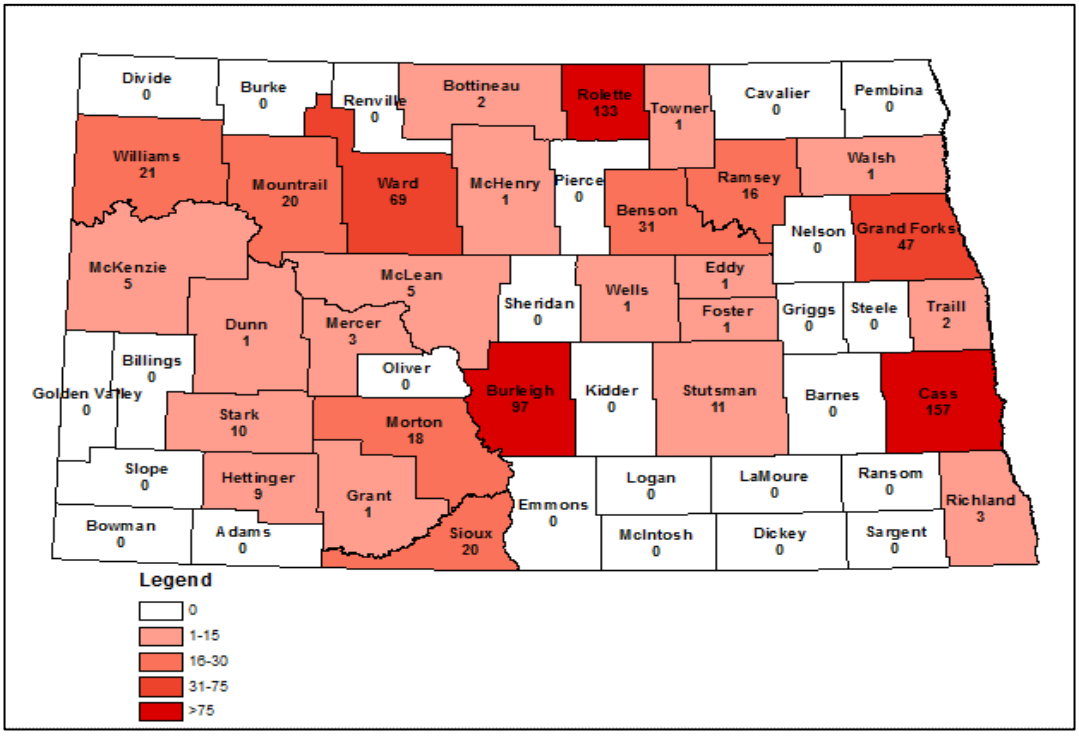
Of the cases reported in 2014, 381 (55%) were reported in females. The majority, 60%, of gonorrhea cases were reported in people ages 20 to 29 (**Figure 43**). The average age of a gonorrhea case increased by nearly two years since 2014, from 24.9 to 26.8 years. Male cases are on average older than female cases.

Figure 43: Gonorrhea Cases by Age Group and Gender, North Dakota, 2015



There were 273 cases of gonorrhea reported among American Indian/Alaskan Natives (688 cases per 100,000 individuals) followed by 256 cases in white individuals (39 cases per 100,000). Among Black/African Americans, the rate was 584 per 100,000 individuals.

Map 6: North Dakota Gonorrhea Cases by County, 2015



Counties reporting the highest gonorrhea rates in North Dakota are Sioux, Rolette, Benson and Ramsey counties, with incidence rates of 857.8, 857.2, 552.6 and 259.6 per 100,000 population, respectively (**Map 6**). Three of these four counties also have the highest chlamydia rates in North Dakota. These rates are higher than the rate of 95 per 100,000 people for all of North Dakota. An additional six counties, Mountrail, Hettinger, McKenzie, Steele, Burleigh, and Ward, have gonorrhea rates higher than the North Dakota rate.

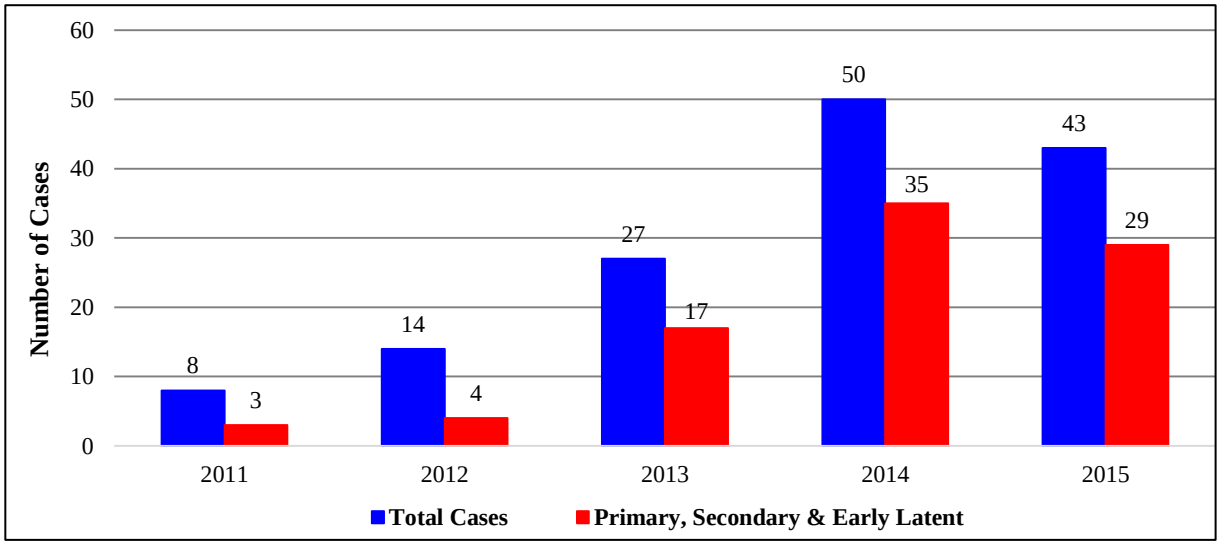
Table 3: Epi Facts of North Dakota Gonorrhea Cases, 2015

Where are cases being diagnosed?	50% diagnosed at a private clinic/hospital; 29% at tribal/IHS facilities, 15% at family planning/pregnancy clinics, and 6% at other facilities.
How are cases being treated?	66 (9.6%) cases were treated inappropriately. *Reminder: the appropriate treatment for gonorrhea is dual therapy of 1 gram azithromycin and 250mg IM ceftriaxone.*
How many cases were interviewed?	62% of cases were reported as being interviewed.
How many partners were tested and treated?	220 partners (0.32 partners per case) were identified for partner services. Of those partners, only 41% were treated. Almost 50% of the partners were unable to be located for notification and treatment.
What are the risk factors for gonorrhea?	For cases with risk factor information, 71% reported having more than one sex partner in the previous 12 months, 51% reported never or not often condom use, 44% reported sex while high or intoxicated, and 26% reported having anonymous sex partners. Eighteen percent of individuals who reported their total number of partners for the past 12 months reported having five or more in that time period.
How many were tested for HIV?	Only 35% of cases were reported as being tested for HIV. All gonorrhea cases are recommended to be tested for HIV at time of diagnosis

Syphilis

In 2014, there was an 85% increase in the number of syphilis cases reported in North Dakota, from 27 to 50 cases (**Figure 44**). Reported cases subsequently decreased by 14% in 2015, to a rate of 5.7 cases per 100,000 individuals. Cases of primary, secondary, and early latent syphilis follow similar patterns as total cases.

Figure 44: Reported Syphilis Cases in North Dakota, 2011-2015



Of total cases reported in North Dakota, 72% were male (**Figure 45**). Female cases decreased by 40%from 2014. In 2015, the average age of cases in all stages was 30.2 years. In contrast to gonorrhea and chlamydia this continues an overall trend of a decreasing average case age. In 2015, 20 syphilis cases were reported in white individuals, twelve were reported in American Indian/Alaskan Natives, and four were reported in Black/African Americans. The rates of syphilis among the latter two groups became similar in 2015, following a 60% decrease in cases reported in American Indian/Alaskan Natives from the previous year.

Figure 45: Reported Syphilis Cases in North Dakota by Age and Gender, 2015

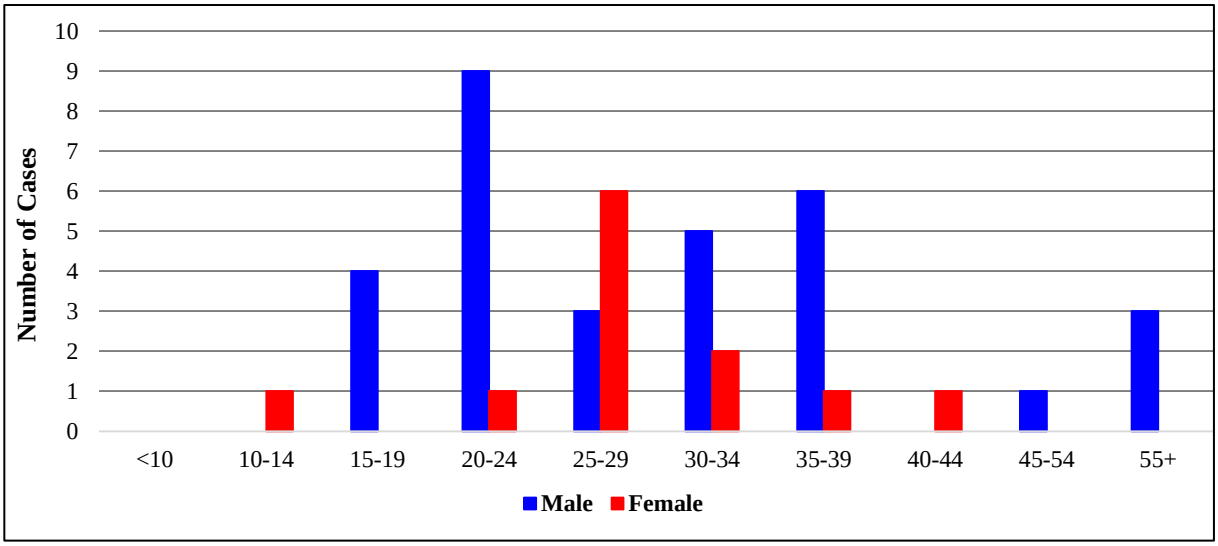
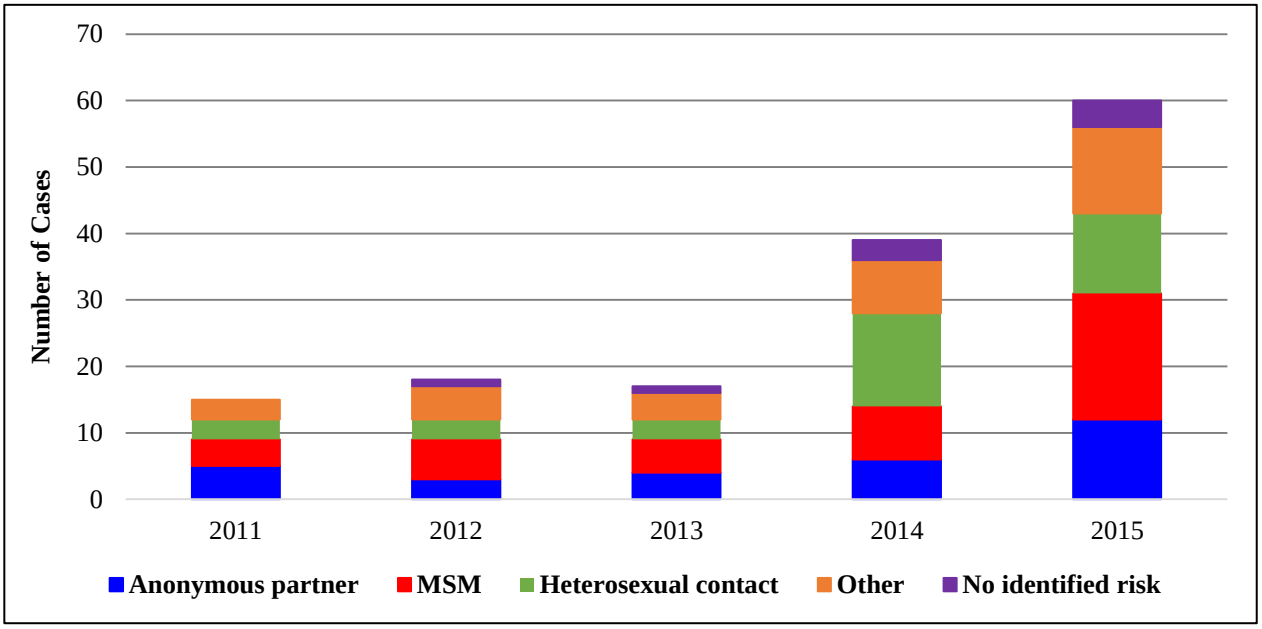
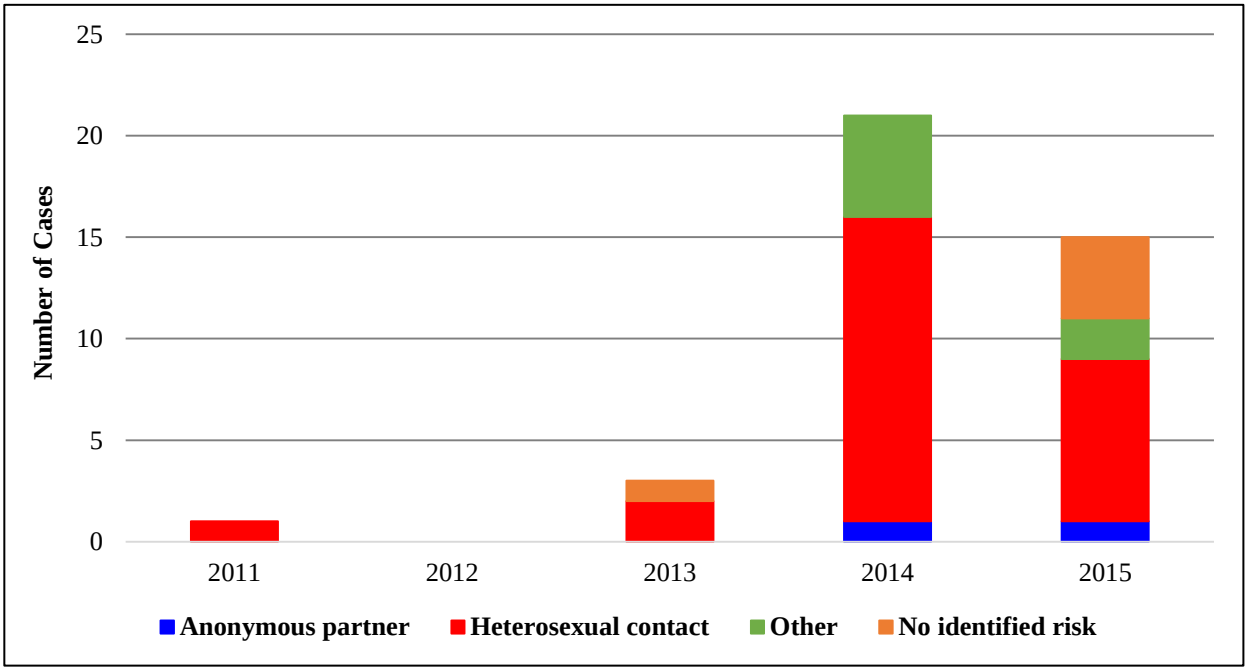


Figure 46: Self-Reported Risk Factors of Male Syphilis Cases in North Dakota, 2011-2015



Male to male sexual contact continues to be the most often self-reported risk factor for male syphilis cases in 2015.

Figure 47: Self-Reported Risk Factors of Female Syphilis Cases in North Dakota, 2011-2015



Heterosexual contact has been the most common self-reported risk factor in female syphilis cases since 2011. No self-reported risk factor information was available in 2012.

Viral Hepatitis

Sarah Weninger, Hepatitis Coordinator

Activities of the viral hepatitis program include testing at-risk individuals for hepatitis C (HCV), vaccinating at-risk individuals for hepatitis A (HAV)/hepatitis B (HBV), providing educational materials for the general public and healthcare providers, organizing and hosting an HIV/hepatitis conference for healthcare providers, and contracting with local public health units (LPHUs) to provide the above mentioned viral hepatitis services. In 2015, NDDoH contracted with 22 sites to offer hepatitis C testing and hepatitis A and B vaccinations. A list of sites where at-risk individuals can be tested is available at www.ndhealth.gov/disease/hepatitis. In 2015, the number of individuals tested at sites increased by 58% compared to 2014. Testing sites screened 2,033 individuals. Of those, 109 (5.4%) were positive in 2015, compared 1,290 individuals being screened, and 88 (6.8%) positive in 2014. In 2013, 686 individuals were screened, and 57 (8.3%) positive.

Hepatitis B Virus

In 2015, 99 cases of chronic HBV infection were reported from 10 counties in North Dakota. This is a 10% increase from the 89 cases reported in 2014 **(Figure 48)**. Of the 99 HBV-positive cases reported to the NDDoH, 49% were female. The average age was 35 (range: 17 to 71 years).

Figure 48: Reported Chronic HBV Cases by Year, North Dakota, 2011-2015

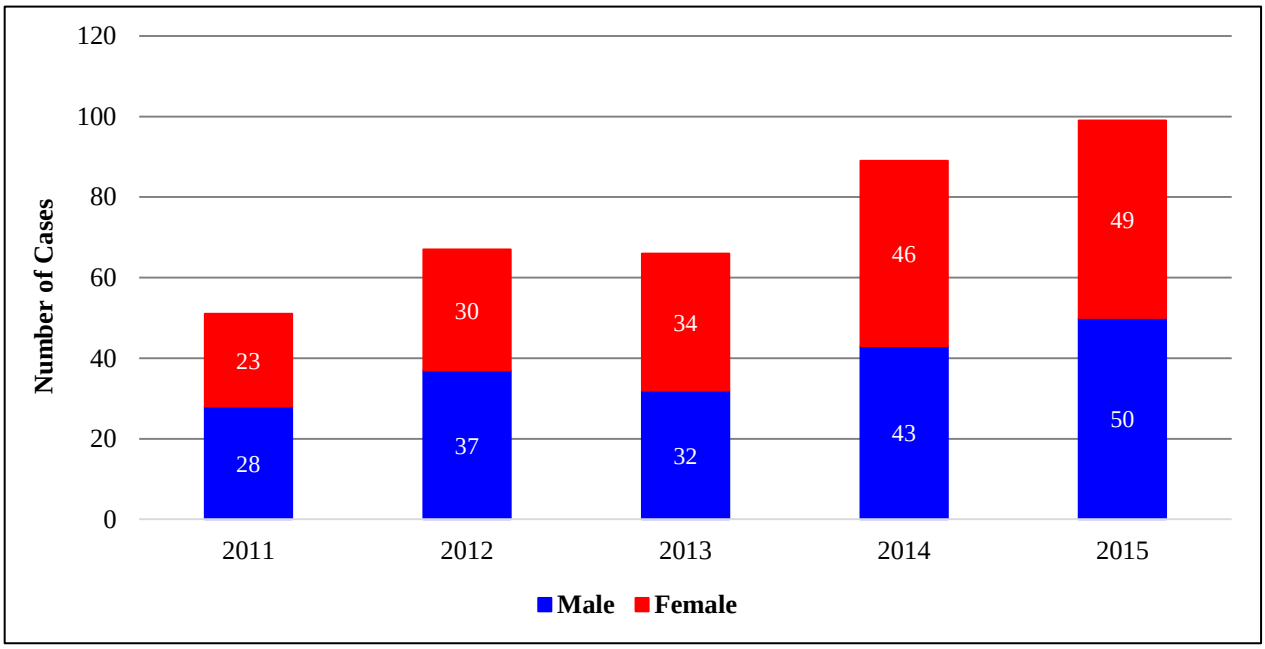
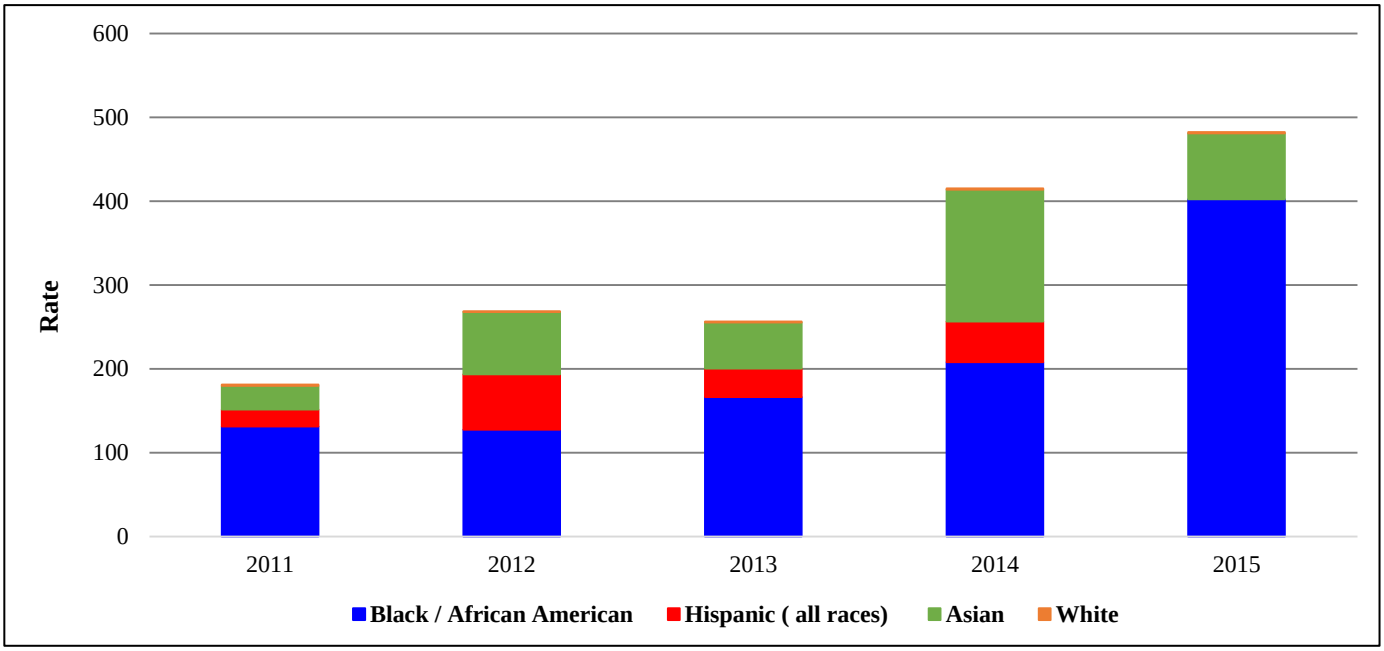


Figure 49: Hepatitis B Rates by Race, North Dakota, 2011-2015

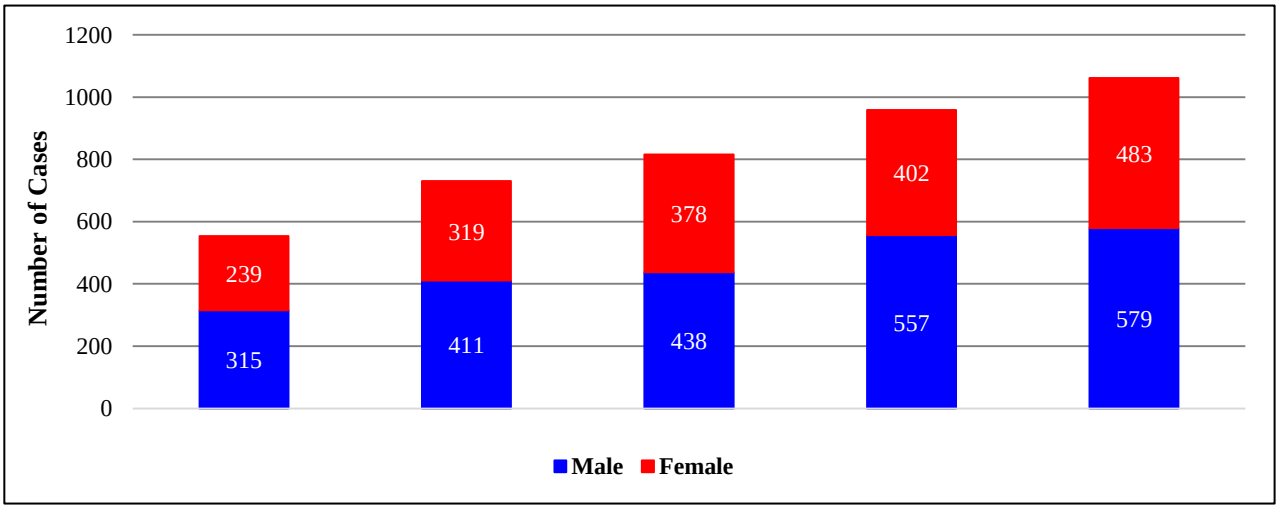


Among those reporting race, 61% were Black/African American, 10% were white and 7 percent were Asian. The majority of cases of HBV occur in persons who are born in countries where HBV is endemic. Since vaccination programs were started in the United States, the number of HBV infections among American born individuals has been drastically reduced.

Hepatitis C Virus

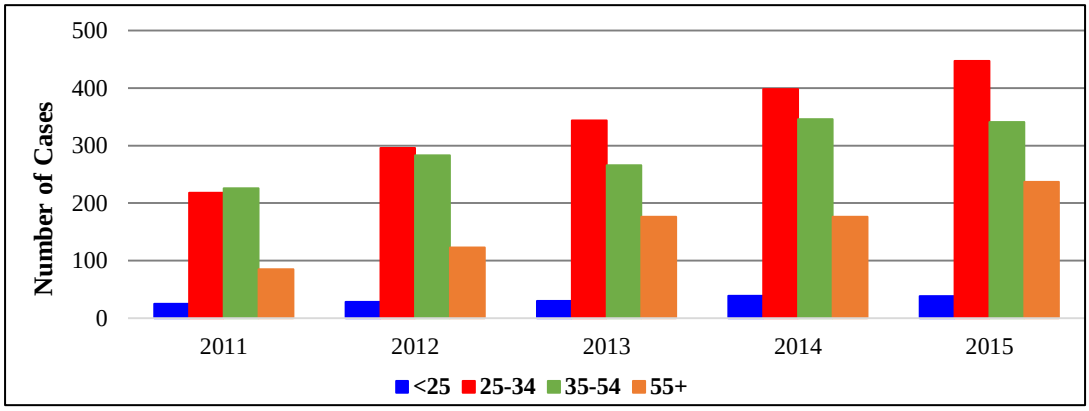
In 2015, the NDDoH received 1,063 reports of newly identified cases as having a positive laboratory result that indicates past or present HCV infection, a 10% increase from the 959 cases reported in 2014 **(Figure 50)**. These numbers do not distinguish between resolved versus current infections.

Figure 50: Reported HCV Cases by Year, North Dakota, 2011-2015



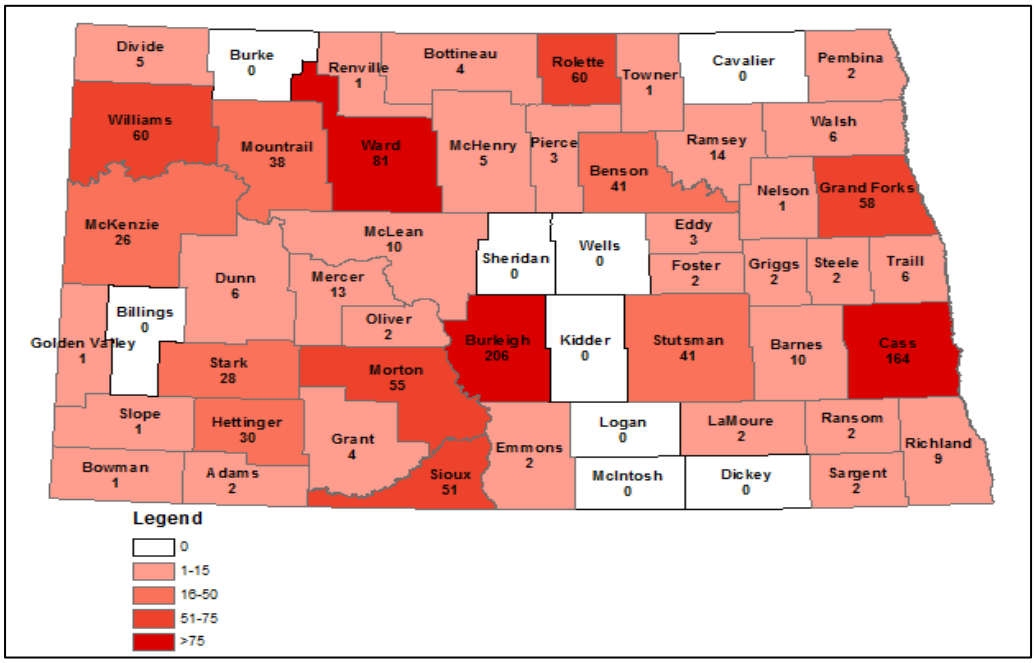
HCV infection in North Dakota is predominantly an adult infection. It is recommended to screen all individuals born between 1945 and 1965. Newly diagnosed cases in 2015 were divided roughly in thirds: 25-34 year olds, 35-54 year olds, and individuals over 55 years. Individuals under 25 accounted for less than five percent of cases in 2015. The average age of cases in 2015 was 40 years (**Figure 51**). Of the 1,063 HCV cases in 2015, 55% were male. Race data is unknown or unavailable for over half of cases since 2011. Among cases with a reported race, 27% were white and 10% were American Indian/Alaskan Native. The rate of HCV among American Indian/Alaskan Natives in 2015 reduced from 577 to 252 cases per 100,000.

Figure 51: Reported HCV by Age Group, North Dakota, 2011-2015



Thirty-nine counties reported cases of HCV, similar to previous years. Cases per county ranged from zero to 206, with a median of three. The counties with the highest rates include Sioux (1,167 per 100,000 people), Hettinger (1,109 per 100,000 people), and Benson (607 per 100,000 people). Hettinger County cases appear high because state correctional facilities in that county screen inmates for HCV.

Map 7: Hepatitis C Cases in North Dakota, 2015



Summary of Selected Reportable Conditions
North Dakota

Reportable Conditions	January - December 2014	January - December 2015
Campylobacteriosis	120	1,755
Chickenpox	21	39
Chlamydia	3,418	3,180
Cryptosporidosis	146	18
E, Coli, shiga toxin positive (non O157)	27	31
E, coli O157:H7	12	13
Enterococcus, Vancomycin-resistant (VRE)	146	323
Giardiasis	39	39
Gonorrhea	697	685
Haemophilus influenza (invasive)	8	24
Acute Hepatitis A	8	6
Acute Hepatitis B	0	60
Acute Hepatitis C	0	783
HIV/AIDS	76	84
Influenza	4,758	3,853
Legionellosis	4	5
Listeria	1	1
Lyme Disease	14	33
Malaria	8	5
Meningococcal disease	2	1
Mumps	1	1
Pertussis	51	44
Q fever	2	0
Rabies (animal)	18	6
Rocky Mountain spotted fever	3	6
Salmonellosis	87	146
Shigellosis	21	24
Staphylococcus aureus, Methicillin-resistant (MRSA)	162	130
Streptococcal pneumoniae (invasive, children <5)	0	11
Syphilis, Primary and Secondary	14	43
Trichinosis	0	0
Tuberculosis	15	17
Tularemia	4	5
Typhoid fever	2	3
West Nile Virus Infection	23	23

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