

North Dakota Epidemiology Report

2014

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 Epi and Surveillance
- Identifies and analyzes disease trends and implements appropriate intervention activities to reduce morbidity and mortality
- Acts as a resource for health care 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



December 29, 2015

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Immunization Program

The North Dakota Immunization Program serves the state of North Dakota in several ways. The North Dakota Department of Health (NDDoH) Immunization Program supplies free vaccines for children who are eligible for the Vaccines for Children (VFC) program and all children receiving vaccines at participating local public health departments, 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

Amy Schwartz, Surveillance Epidemiologist

Measles

In 2014, the United States experienced 23 measles outbreaks. Many of the cases in the U.S. were related to a large scale outbreak occurring in the Philippines. The final case count in 2014 for the United States was 668 cases from 27 states. This was the greatest number of cases documented since measles elimination was declared in the United States in 2000. Most of these cases were not vaccinated or did not know their vaccination status.

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 vaccine (MMR) 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.

Fortunately, no cases of measles were reported in North Dakota. However, South Dakota reported a case of measles in December of 2014. This was South Dakota's first case since 1997. The outbreak in South Dakota totaled 13 cases of measles. North Dakota's last case of measles was in 2011.

Meningitis

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 also 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.

There were 502 cases of invasive meningococcal disease reported in the United States in 2014. Additionally, outbreaks involving *Neisseria meningitidis* serogroup B have occurred on several college campuses. Outbreaks have been reported in 2008, 2011, 2013, and 2015. The only college campus outbreak in 2014 occurred at Princeton University. It began in 2013 and lasted into 2014.

A vaccine available in the United States is routinely recommended for adolescents and provides protection against meningococcal disease serogroups A, C, Y, and W-135; however, a vaccine for serogroup B was not available until recently. On October 29, 2014, the Food and Drug Administration (FDA) licensed the first serogroup B meningococcal vaccine.

Pertussis

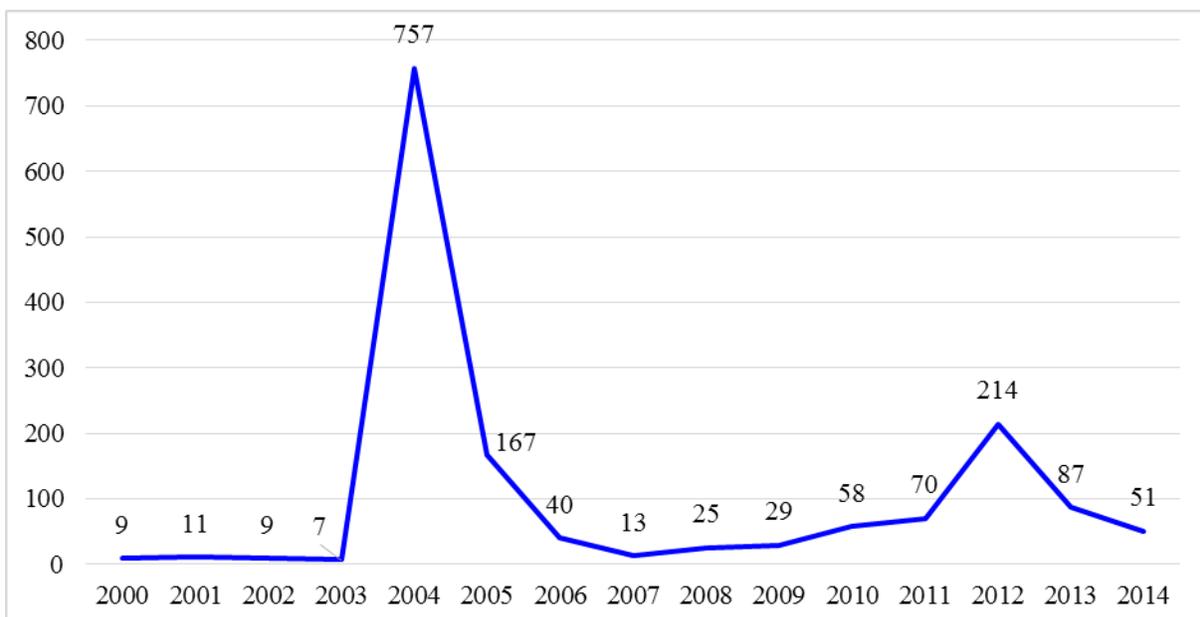
Pertussis or whooping cough is a respiratory disease caused by the bacteria *Bordetella pertussis*. The illness usually begins with cold-like symptoms and progresses to a cough, which gradually becomes more severe. Pertussis is known for uncontrollable, violent coughing which often makes it hard to breathe. 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 result 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 routinely recommended vaccines protect against pertussis. DTaP is routinely recommended for infants at ages 2, 4, 6 and 15-18 months with an additional dose given at age 4-6 years. Tdap vaccine is routinely recommended for adolescents at age 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 can also be passed to the fetus to protect the infant during the first few months of life.

In 2014, 28,660 cases of pertussis were reported in the United States. North Dakota reported 51 cases in 2014. 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 2000-2014



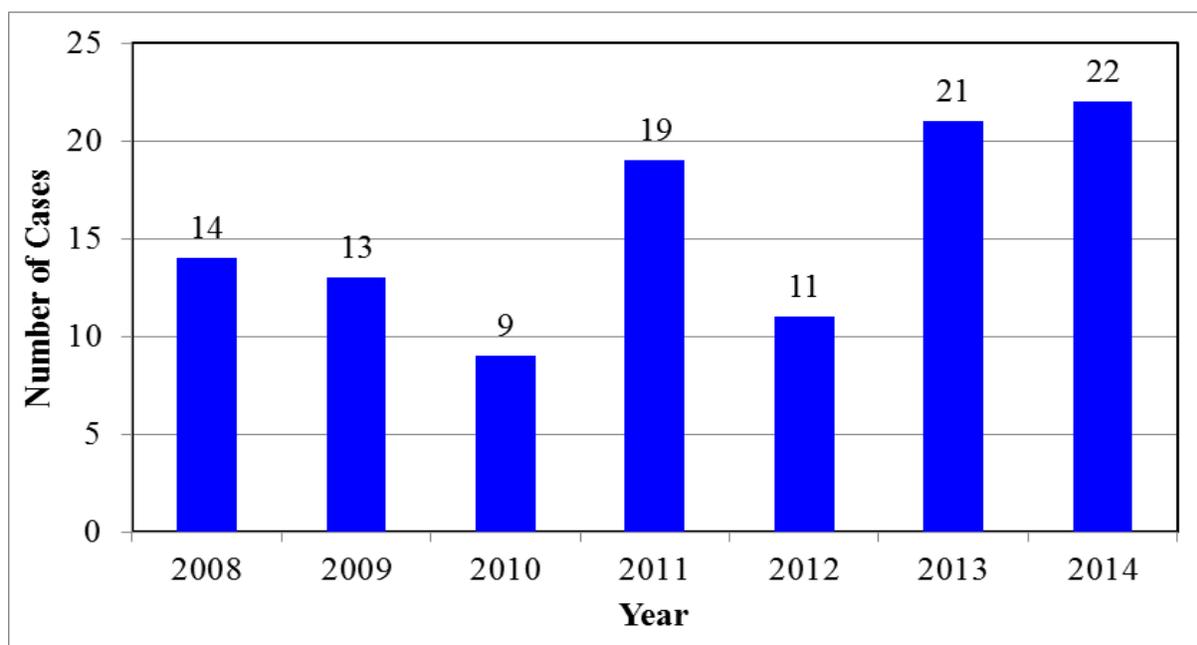
North Dakota Perinatal Hepatitis B Program

Hepatitis B is a virus that can be transmitted via blood or other bodily fluids that contain blood, 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 that 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 2008 (**Figure 2**).

Figure 2: The number of births to hepatitis B positive women in North Dakota by year



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 2014-2015 school year, the response rate from schools was 98.8 percent (417/422). All of the kindergarten vaccination rates for the 2014-2015 school year fell below the Healthy People 2020 goals of 95 percent coverage for all school entry vaccinations.

Figure 3: Kindergarten entry immunization rates for the 2014-2015 school year

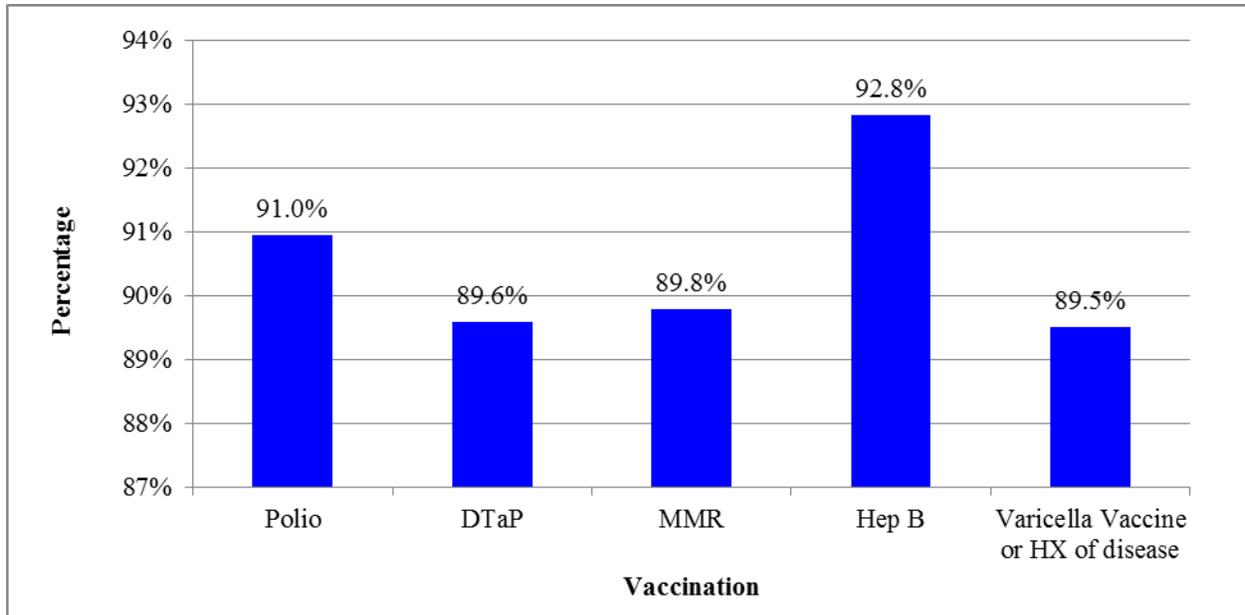
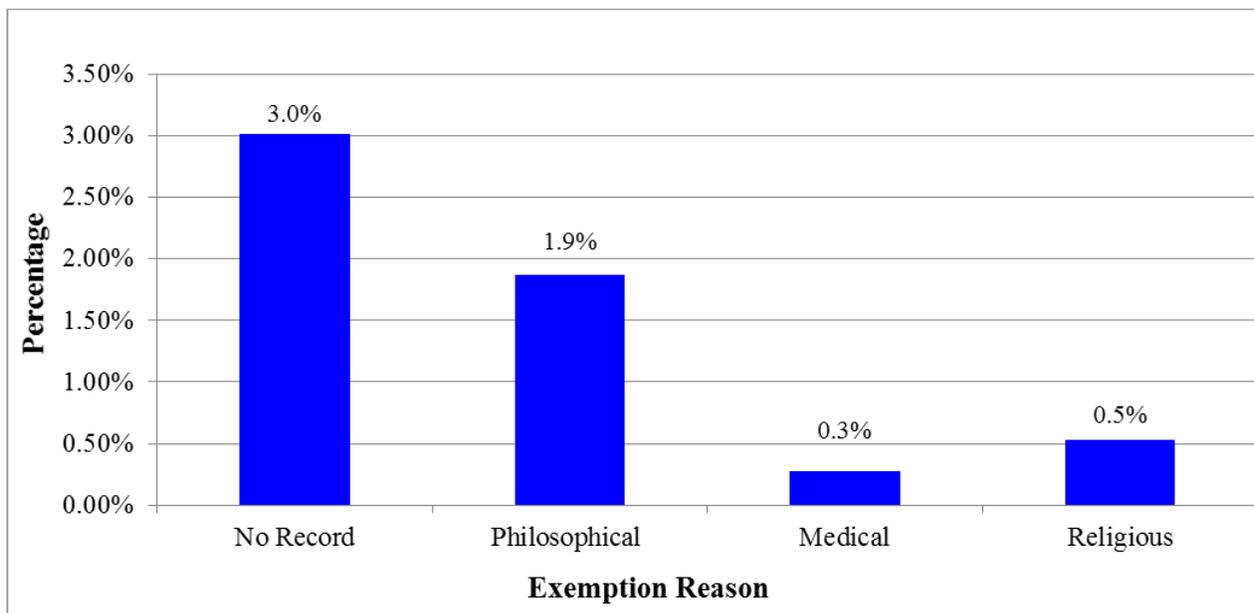
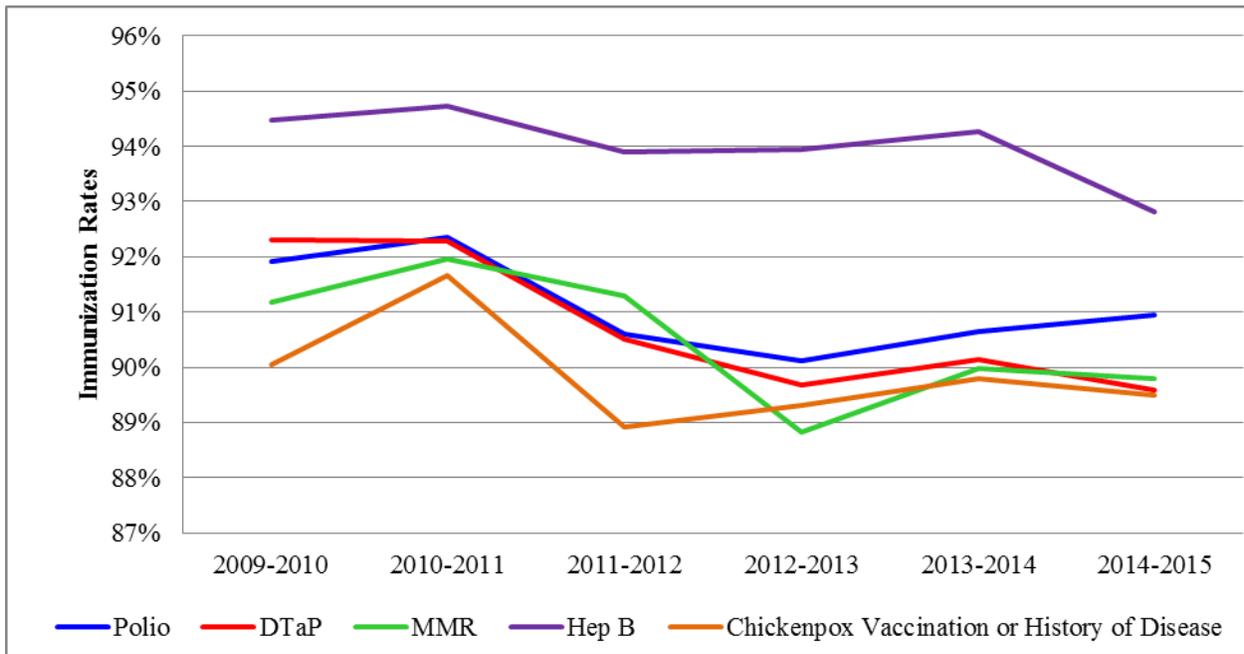


Figure 4: Kindergarten entry exemption rates for the 2014-2015 school year



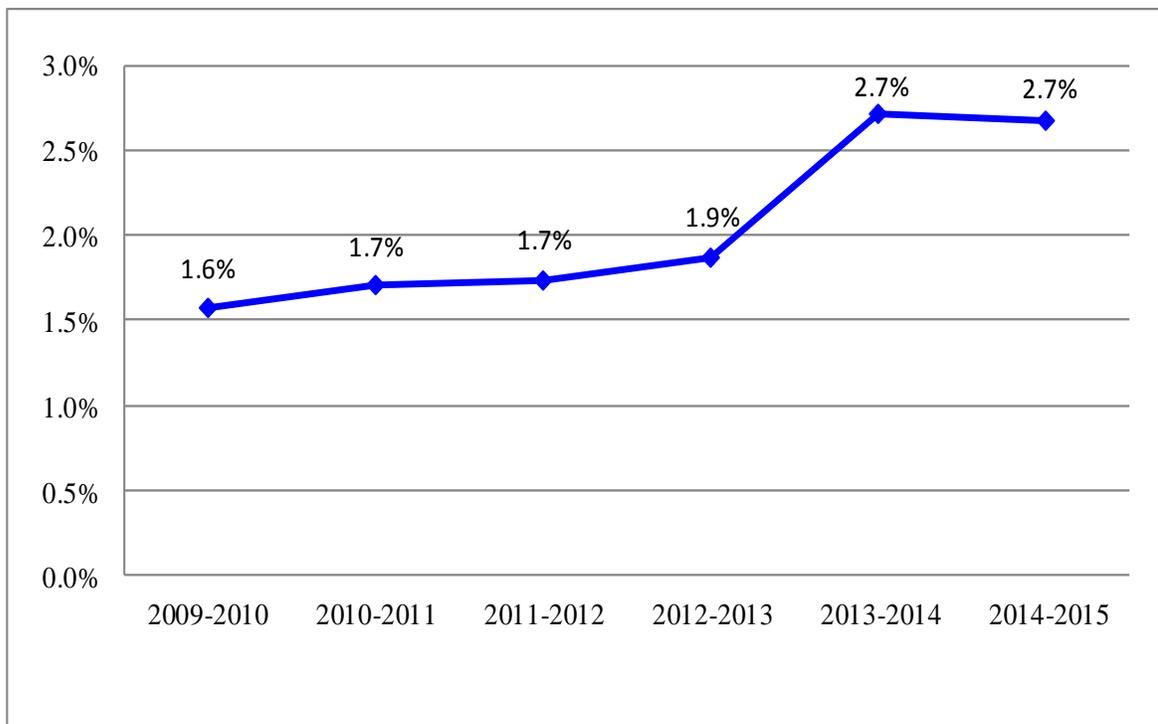
Additionally, vaccination coverage rates have been trending downward since the 2010-2011 school year.

Figure 5: Kindergarten entry immunization rates from 2009 to 2015



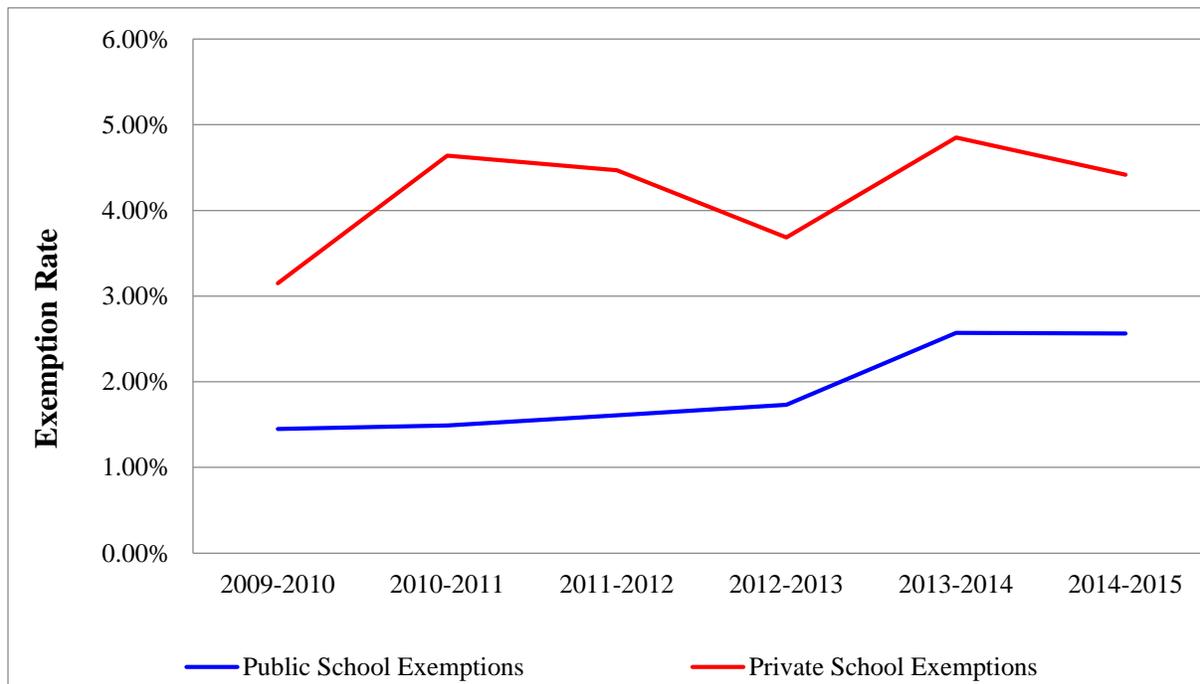
Exemptions rates are continuing to increase in kindergarten-aged children, but not nearly enough to accommodate for the drop in immunization rates. The drop may be attributed to a number of factors: these children may truly be up-to-date, but the schools are not collecting updated immunization records;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

Figure 6: Kindergarten entry exemption rates from 2009 to 2015



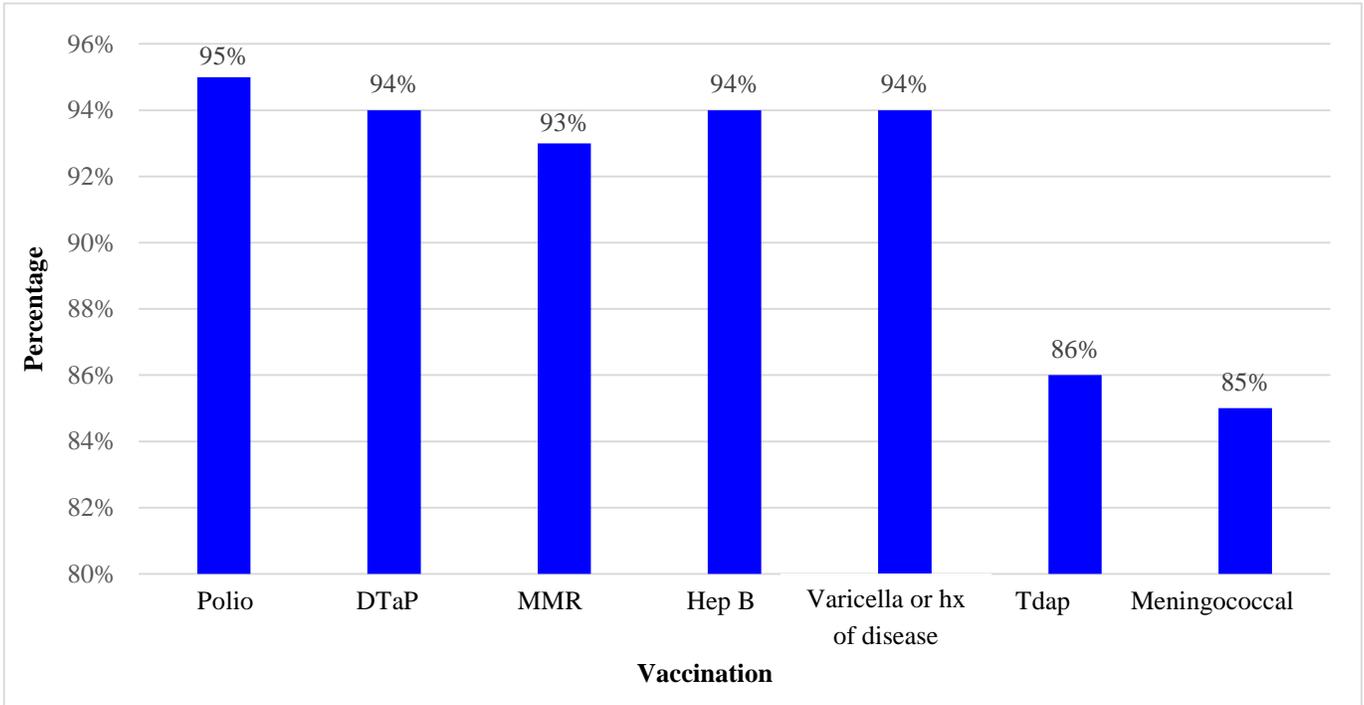
The rise in exemptions becomes more apparent when kindergarten data is separated by school type. This is shown in **Figure 7**.

Figure 7: Kindergarten entry exemption rates from 2009 to 2015 stratified by school type



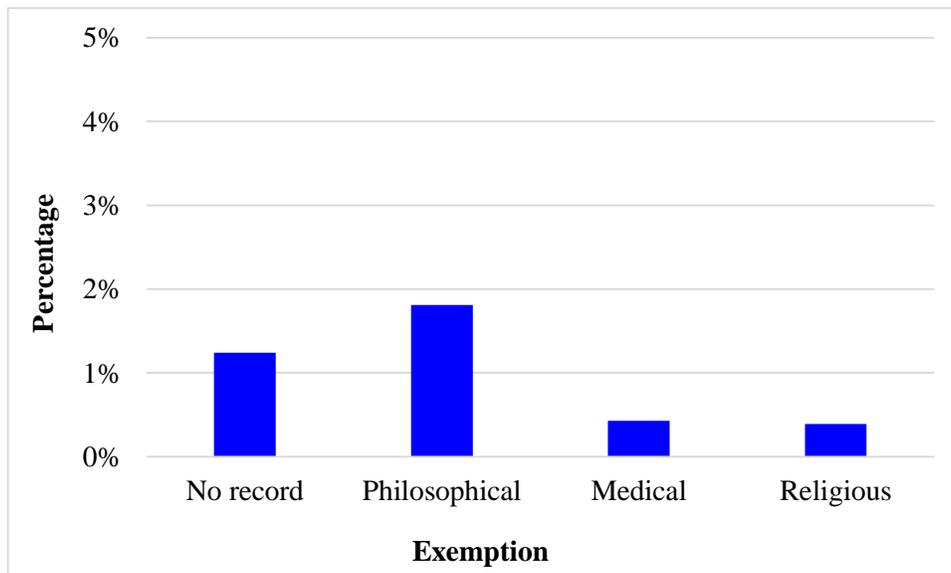
Seventh Grade School Vaccination Rates

Figure 8: Seventh grade entry immunization rates for the 2014-2015 school year



Tdap and MCV4 were first required for middle school entry in 2008. For the 2014-2015 school year, Tdap and MCV4 were required for seventh grade entry. The requirement was changed in order to standardize the recommendations. Tdap and meningococcal coverage rates were about 86 percent and 85 percent, respectively. Seventh grade entry exemption rates were comparable to kindergarten entry exemption rates.

Figure 9: Seventh grade entry exemption rates for the 2014-2015 school year



Epidemiology and Surveillance Program

The Epidemiology and Surveillance Program is responsible for the management and surveillance of infectious disease area specific 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, Ebola, and general infection control assessment and outbreak response activities.

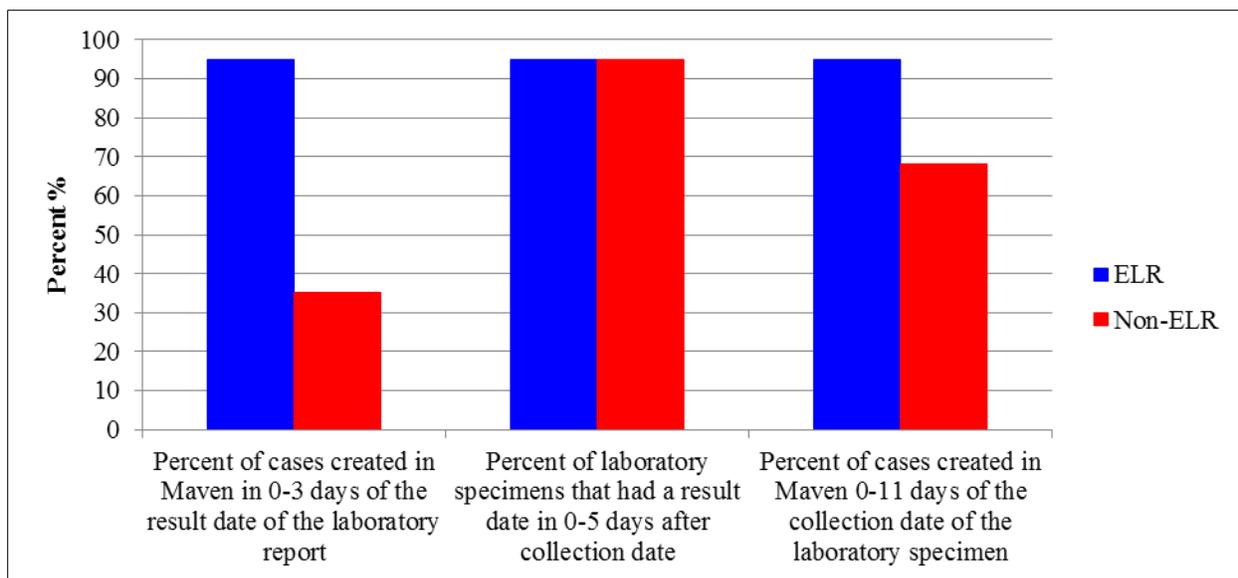
Electronic Laboratory Reporting (ELR)

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 2014, NDDoH had eight laboratories in production with ELR, three of which had been added in 2014.

The total numbers of laboratory results received in 2014 were 16,943. Of those, 10,488 (61%) were reported through ELR. For ELR, 95 percent of cases were created in Maven, NDDoH's electronic disease surveillance system. In zero to three days of the result date of the laboratory report, 95 percent of cases had zero to nine days between specimen collection date and date of result, and 95 percent of cases had zero to 11 days between specimen collection date and date the case was created in Maven. For non-ELR, 35 percent of cases were created in Maven in zero to three days of the result date of the laboratory report, 95 percent of cases had zero to five number of days between collection date of laboratory specimen and date of result, and 68 percent of cases had zero to 11 days between collection date of laboratory specimen and date of when the case was created in Maven (**Figure 10**).

Figure 10: Comparison of laboratory reports to be reported to NDDoH, 2014



Looking at the same time period, three hospitals' 2013 laboratory reports were compared with their 2014 laboratory reports after implementing ELR. Analysis showed a significant improvement in both the numbers of reports received by the NDDoH and the timeliness from specimen collection and report date to creation in Maven was achieved after implementation of ELR.

Implementation of ELR improves timeliness and accuracy of laboratory results. A greater proportion of cases are 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

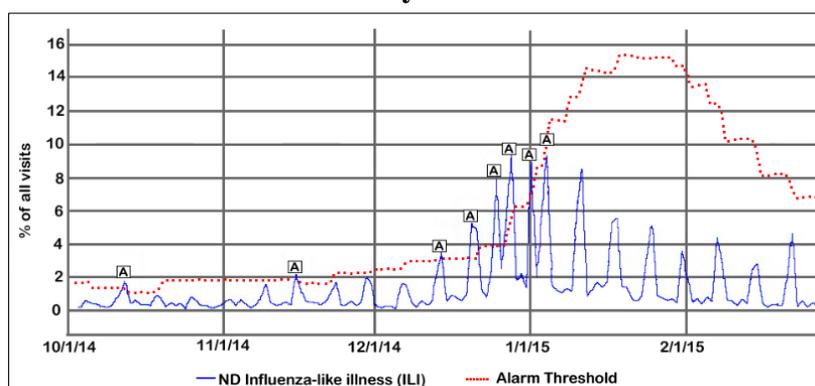
Jill Baber, Syndromic Surveillance Epidemiologist

Syndromic surveillance is a form of biosurveillance that includes de-identified patient level data. Data collected includes chief complaint, diagnosis, and other “reason for visit” data from multiple sources to monitor a variety of syndromes. Syndromes are 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. However, new syndromes can be created based on emerging public health needs. For example, syndromic surveillance has been used to monitor injuries after severe weather events, heat related illnesses, respiratory illnesses during the enterovirus D68 outbreak and animal bites.

This year, the NDDoH rolled out a new syndromic surveillance platform, BioSense 2.0. NDDoH’s previous syndromic surveillance platform, RedBat, was discontinued in 2013. BioSense 2.0 is a free, cloud-based application that is available to health departments through the Centers for Disease Control and Prevention (CDC). NDDoH sends de-identified data multiple times per day that is loaded into the system and available for view by NDDoH epidemiologists. Although syndromic data is traditionally tied with emergency department data, NDDoH also accepts syndromic messages for inpatient and outpatient clinic visits.

NDDoH epidemiologists check the system daily to monitor trends and follow up on any anomalies that are identified. An anomaly is a day in the record when the number of visits for a particular syndrome exceeds what is typically seen by two standard deviations or more. Most anomalies are actually coincidences, but this year NDDoH identified anomalies associated with a GI outbreak and with the start of the influenza season. Even non-anomaly trends are important, and 2014 syndromic data was used to monitor for Ebola-related and measles-related visits, track ILI trends, and monitor for encounters related to enterovirus D68.

Figure 11: ILI for October to February is viewable in this BioSense 2.0 screenshot.



Many facilities that send syndromic data to NDDoH are fulfilling Public Health Meaningful Use requirements. Throughout 2014, NDDoH added messages from seven hospitals and 18 walk-in clinics to the BioSense 2.0 environment. NDDoH also receives federal Department of Defense data through BioSense 2.0 from clinics associated with North Dakota’s two Air Force bases. Recruitment for additional providers or facilities continues for 2015 to expand our geographic coverage.

For more information on syndromic surveillance and other public health Meaningful Use initiatives, please visit: www.ndhealth.gov/Disease/MU/.

Respiratory Diseases

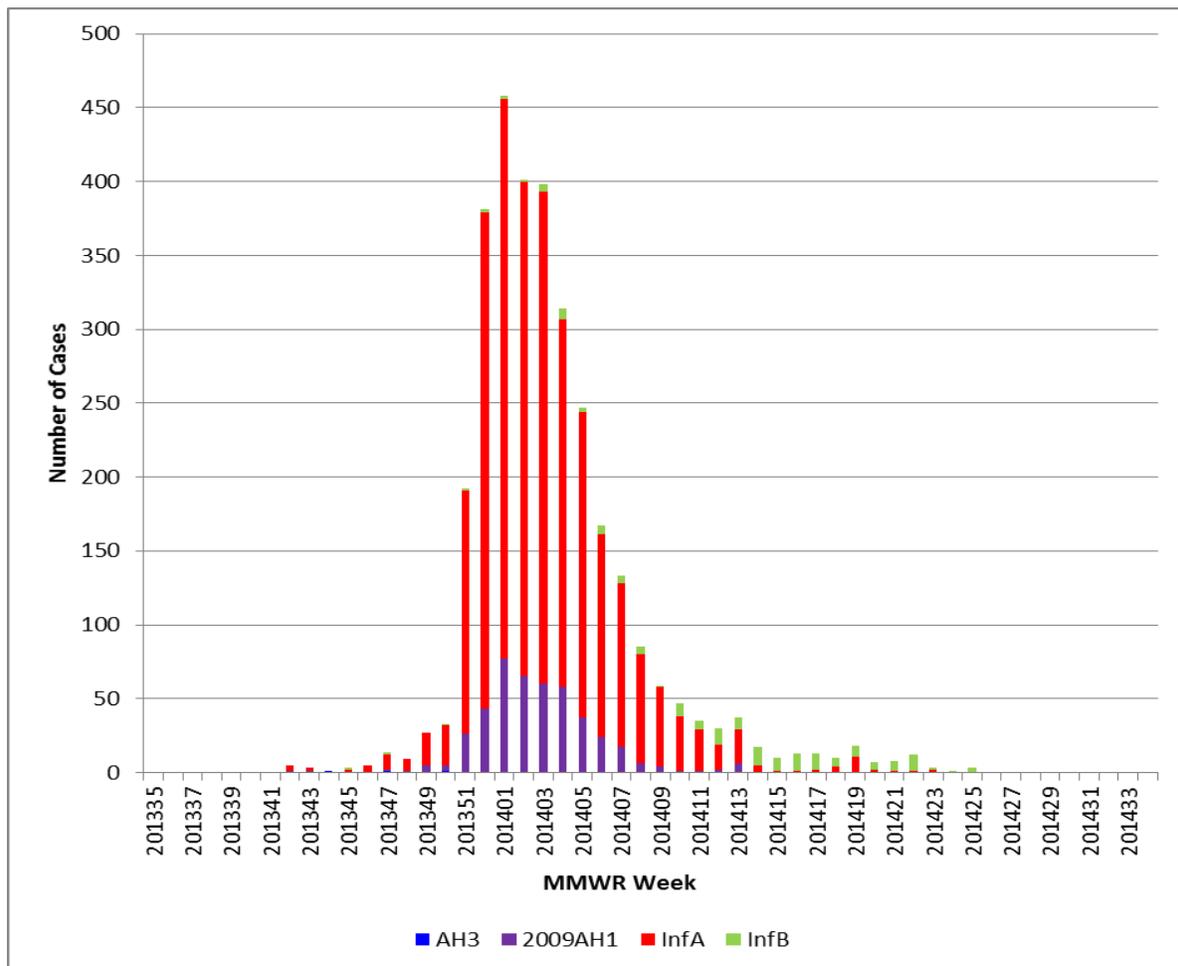
Jill Baber, Influenza Surveillance Epidemiologist

2013-2014 Influenza Season

Influenza surveillance activities for the 2013-14 season officially started September 1, 2013. The NDDOH requires that all laboratory-identified cases of influenza be individually reported to the NDDoH. During the 2013-14 influenza season, a total of 2,919 cases were identified via viral culture, DFA, IFA, PCR or rapid test. Overall, we saw fewer reported cases this year compared to last year (4,833 cases). Peak activity was reached the week ending January 4, 2014 (**Figure 12**). Similar to last season, this was a relatively early peak for the influenza season.

The 2009 A H1N1 pandemic strain (2009 A H1N1) was overwhelmingly the predominant influenza strain identified during the 2013-14 season. This is the first season since the 2009 pandemic that 2009 A H1N1 has been the predominant strain. In addition to 2009 A H1N1 cases, a handful of A H3 and some influenza B were identified throughout the season, with more influenza B in the second half. Ninety-five percent of cases were Influenza A (2,764). Of the influenza specimens that underwent PCR for subtyping, 452 were identified as type 2009 A H1N1, three identified as type A-H3 and 155 identified as type B.

Figure 12: North Dakota 2013-2014 reported case count for seasonal influenza



As part of the National Notifiable Diseases Surveillance System (NNDSS), the Department of Health conducts surveillance for influenza-associated pediatric deaths. There were no influenza-associated deaths in children identified for the 2013-14 season (**Table 1**). Vital Statistics reporting identified eight influenza-associated deaths, three of which were in adults under the age of 60. For the 2012-13 season, none of the nine reported deaths fell into the under 60 age group.

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

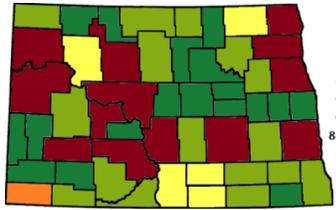
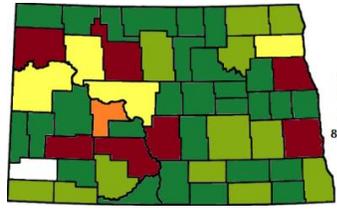
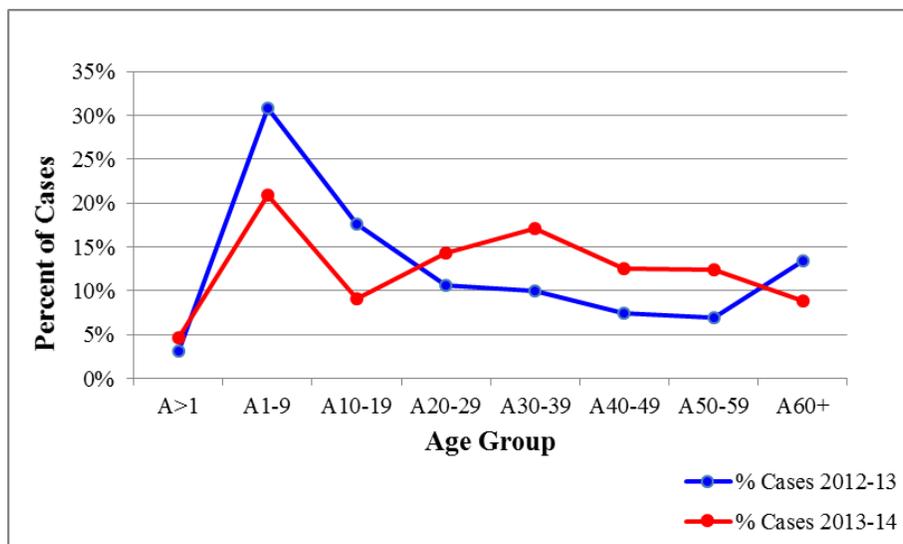
2012-13 season	2013-14 season
predominantly A H3N2	predominantly 2009 A H1N1
4,834 lab-confirmed cases: 204 A H3N2 18 2009 A H1N1 3,027 A not subtyped 1,584 B 2 unspecified	2,919 lab-confirmed cases 3 A H3N2 452 2009 A H1N1 2,309 A not subtyped 155 B 0 unspecified
Cases by county 	Cases by county 
216 hospitalizations	147 hospitalizations
9 deaths	8 deaths
32 long term care outbreaks	3 long term care outbreaks
peak: week of Dec. 23 ^a	peak: week of Dec. 29 ^b

Figure 13: North Dakota seasonal influenza cases by age, 2012-2014.



Enterovirus D68

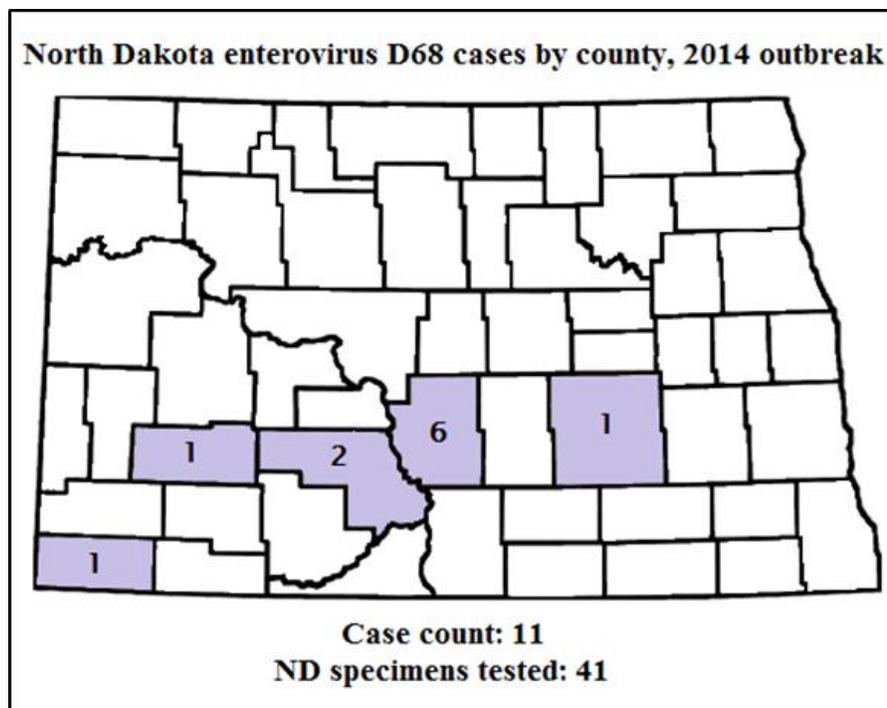
Beginning in August 2014, the United States experienced a nationwide outbreak of respiratory illness associated with enterovirus D68 (EV-D68). Increases in enteroviruses are common every year during summer and fall months, but the 2014 enterovirus season appeared more severe than usual, especially in children.

Additionally, 2014 was the first year increased numbers of EV-D68 were noted nationally. In previous years, EV-D68 had only been identified sporadically. However, our understanding of “typical” EV-D68 behavior was limited, as infection with enteroviruses is not reportable anywhere in the United States.

Our understanding of EV-D68 circulation was derived from information gathered by a handful of viral sentinel programs that tested and typed a wide variety of respiratory viruses. The CDC initiated a call for specimens from patients hospitalized with severe respiratory disease that tested positive at the hospital for entero/rhinovirus in an attempt to understand the new behavior of the virus.

Average age	5.87 years
Age range	2 months – 12 years
Gender	
• Female	4 (36%)
• Male	7 (64%)
Onset date	9/6/2014 - 9/21/2014
Number with underlying health conditions	6 (54%)
Symptoms	
• shortness of breath	9 (82%)
• cough	7 (64%)
• fever	7 (64%)
• wheezing	5 (45%)
• runny nose	4 (36%)
• sore throat	3 (27%)
• abnormal chest x-ray	5 (45%)

Map 1: North Dakota Enterovirus Outbreak



There was also concern that EV-D68 was behind small clusters of an acute, neurologic illness causing limb weakness and flaccid paralysis in children identified in several states. No definitive link between EV-D68 and the neurologic illness cases has been demonstrated, although the investigation is ongoing. No ill patients in North Dakota during the outbreak met CDC’s case definition for neurologic disorder.

Table 3: Test results for samples submitted to the North Dakota Public Health Laboratory for enterovirus D68 testing in 2014 (n=41)

Test Result	Number of Samples
Enterovirus D68	11 (27%)
Other enterovirus	2 (5%)
Rhinovirus	10 (24%)
No entero/rhino detected	18 (44%)

Initial reports of clusters of hospitalized children sick with severe illness caused by a disease largely unknown to the general public resulted in considerable public concern and media coverage. For this outbreak, testing was for epidemiologic purposes only. Unlike influenza, for which the burden of disease is significant every year and for which immunizations and specific antiviral treatment are available, enteroviruses have no specific treatment regimen. Prevention recommendations for the disease are general: hand washing, covering coughs, and staying home when ill. Testing was also time consuming—taking up to two weeks for most cases—and nearly all North Dakota cases had recovered by the time their test results were available. CDC has now developed a rapid test, and for 2015, DLS will be able to test for EV-D68 in-house.

It is difficult to say if we will see a high incidence of EVD-68 again in 2015. The CDC investigation into why the virus caused an unusual number of severe cases is still ongoing. However, results from the EV-D68 outbreak serve as an important reminder that virtually any respiratory virus can be deadly.

Acute Viral Gastroenteritis

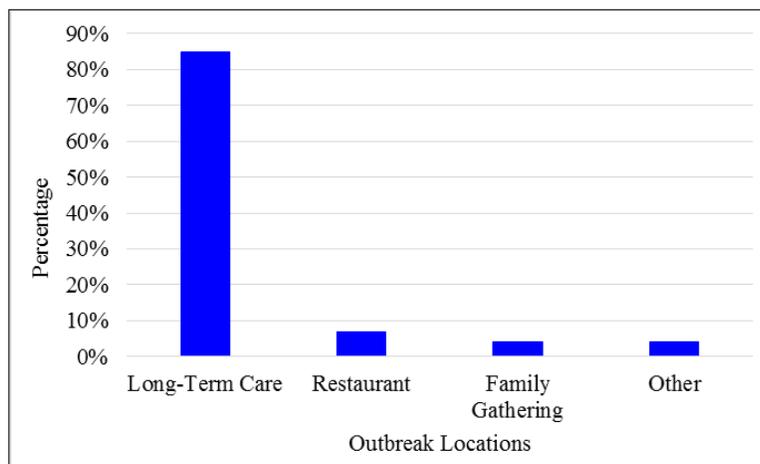
Alicia Lepp, Surveillance Epidemiologist

Twenty-eight acute viral gastroenteritis (AGE) outbreaks were reported to the NDDoH from 18 counties in 2014. An AGE outbreak is defined as two or more people associated with a common venue having acute vomiting and/or diarrhea lasting 24 to 48 hours.

Outbreaks of AGE often are reported in long-term care facilities. Twenty-three of the 28 outbreaks reported to the NDDoH in 2014 occurred in healthcare settings. More than 436 residents and 356 staff of healthcare settings were ill at the time the outbreaks were reported. Five outbreaks outside of healthcare settings were reported compared to seven reported during the same time period last year.

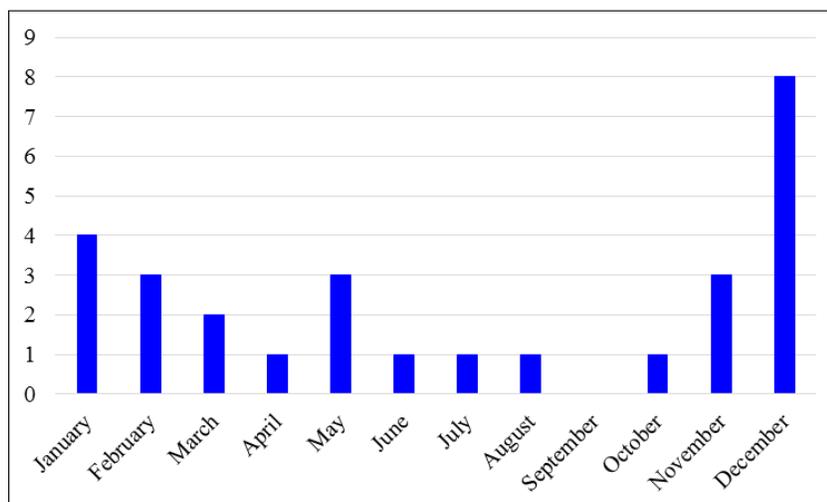
Ill food handlers are a common cause of AGE outbreaks outside of healthcare settings, where spread is by a common vehicle, such as food, and not via person-to-person contact.

Figure 14: AGE outbreaks by setting North Dakota, 2014



AGE outbreaks are known to be more common during the winter months. More than half (61%) of the AGE outbreaks reported in 2014 have occurred from December to March (**Figure 15**).

Figure 15: Number of AGE outbreaks reported in North Dakota by month, 2014



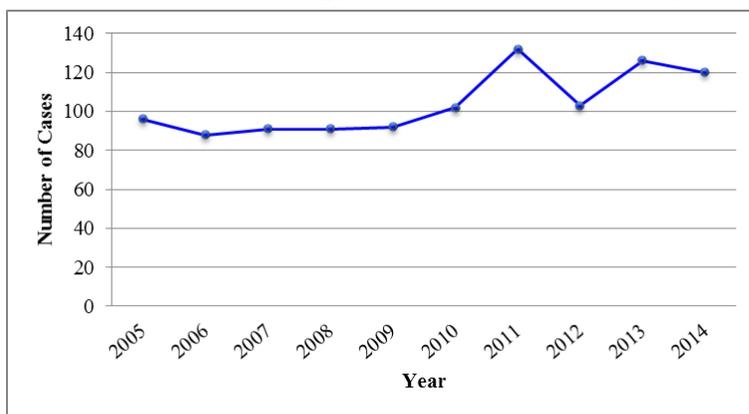
Enteric Diseases

Alicia Lepp, Surveillance Epidemiologist

Campylobacteriosis

In 2014, 120 cases of campylobacteriosis were reported to the NDDoH, a 5 percent decrease from the 126 cases reported in 2013 (**Figure 16**). Statewide, campylobacter incidence rate was 16.6 cases per 100,000 people in 2014. Thirty-four counties reported cases, with Golden Valley (219.4 cases per 100,000 people), Steele (102.0 cases per 100,000 people) and Dickey (95.3 cases per 100,000 people) having the highest incidence of campylobacter.

Figure 16: North Dakota Campylobacter Case Counts by Year, 2005-2014

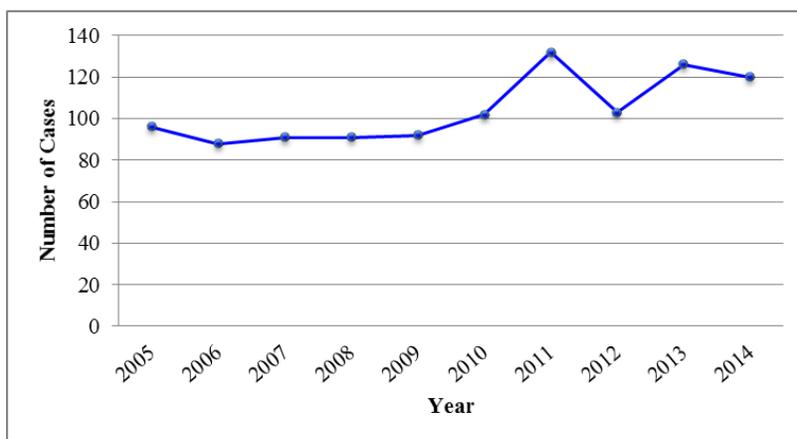


The median age of cases of campylobacteriosis was 39.5 years (range: 1-81 years). Persons age 40-49 years had the highest age-specific incidence rate (23.6 cases per 100,000 people). Seventy-one (59%) of the reported cases were male. Fourteen (12%) cases were hospitalized.

Cryptosporidiosis

In 2014, 148 cases of cryptosporidiosis were reported to the NDDoH, a 76 percent increase from 84 cases reported in 2013 (**Figure 17**). Statewide cryptosporidiosis incidence was 20.5 cases per 100,000 people in 2014. Twenty-four counties reported cases, with Rolette (123.4 cases per 100,000 people), Stark (74.4 cases per 100,000 people) and Logan (51.4 cases per 100,000 people) having the highest incidence of cryptosporidiosis.

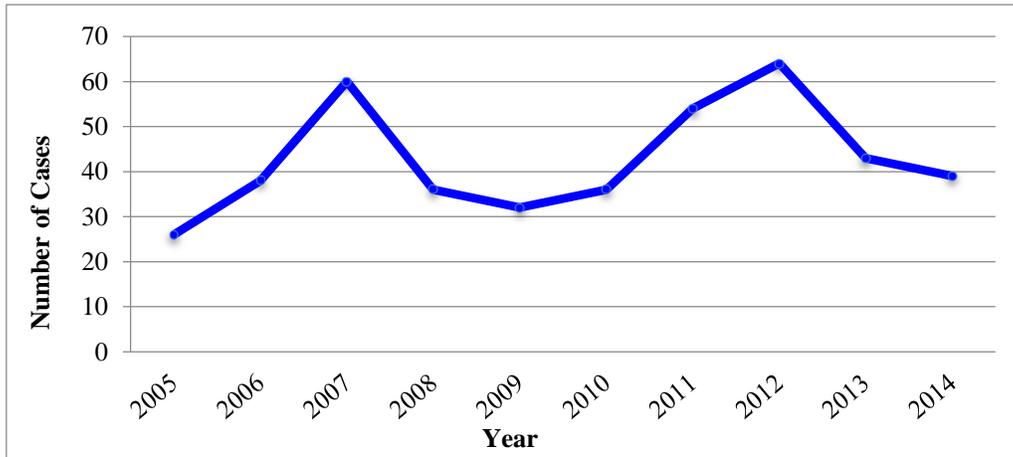
Figure 17: North Dakota Cryptosporidiosis Case Counts by Year, 2005-2014



Giardiasis

In 2014, 39 cases of giardiasis were reported to the NDDoH, an 11 percent decrease from 44 cases reported in 2013 (**Figure 18**). Statewide giardiasis incidence was 5.4 cases per 100,000 people in 2014. Seventeen counties reported cases, with Logan (154.2 cases per 100,000 people), Adams (42.4 cases per 100,000 people) and Bottineau (29.7 cases per 100,000 people) having the highest incidence of giardiasis.

Figure 18: North Dakota Giardiasis Case Counts by Year, 2005-2014

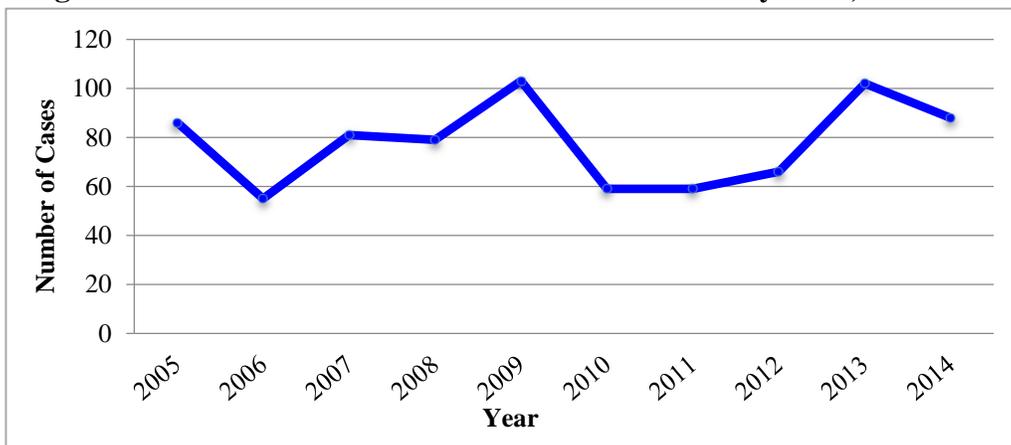


The median age of cases of giardiasis was 33 years (range: 1-71 years). Persons age 0-4 had the highest age-specific incidence rate (16.4 cases per 100,000 people). Twenty-five (64%) were male. Three (8%) cases were hospitalized.

Salmonella

In 2014, 88 cases of salmonellosis were reported to the NDDoH, a 14 percent decrease from 102 cases reported in 2013 (**Figure 19**). Statewide salmonellosis incidence was 12.2 cases per 100,000 people in 2014. Twenty-eight counties reported cases, with Adams (84.7 cases per 100,000 people), Grant (84.1 cases per 100,000 people) and McIntosh (72.6 cases per 100,000 people) having the highest incidence of salmonellosis.

Figure 19: North Dakota Salmonellosis Case Counts by Year, 2005-2014

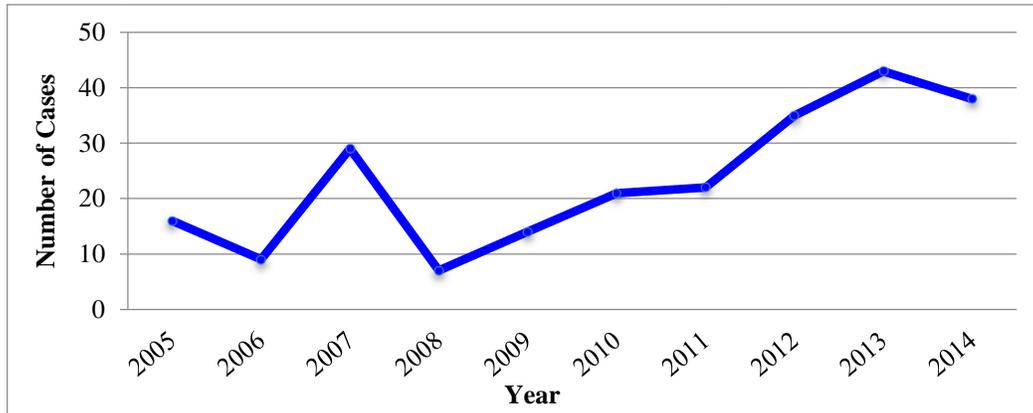


The median age of cases of salmonellosis was 33 years (range: 1-91 years). Persons age 0-4 years had the highest age-specific incidence rate (24.6 cases per 100,000 people). Fifty-two (59%) were female. Twenty-three (26%) cases were hospitalized.

Shiga-toxin Producing E. coli (STEC)

In 2014, 38 cases of STEC were reported to the NDDoH, a 12 percent decrease from 43 cases reported in 2013 (**Figure 20**). Of the 38 cases in 2014, 12 were *E.coli* O157:H7. In 2013, 14 of the 43 cases were *E.coli* O157:H7. Statewide STEC incidence was 5.3 cases per 100,000 people in 2014. Nineteen counties reported cases, with Logan (51.4 cases per 100,000 people), Divide (43.2 cases per 100,000 people) and Emmons (28.7 cases per 100,000 people) having the highest incidence of STEC.

Figure 20: North Dakota STEC Case Counts by Year, 2005-2014

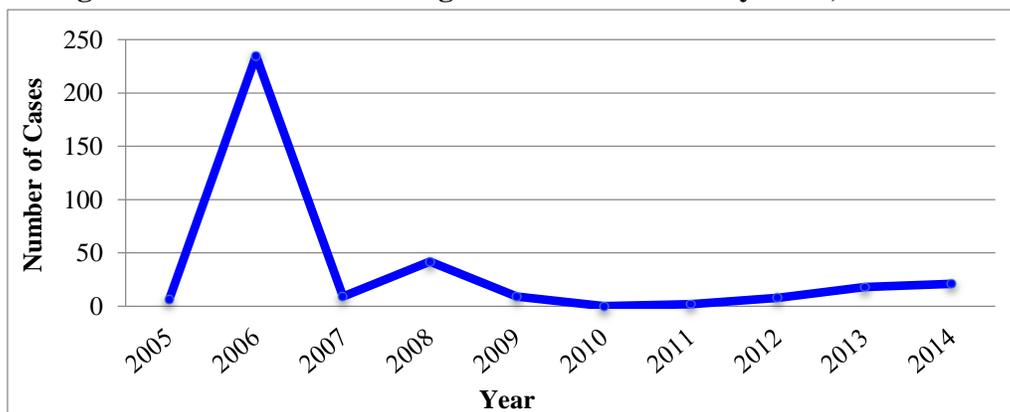


The median age of cases of STEC was 22 years (range: 1-86 years). Persons age 0-4 years had the highest age-specific incidence rate (22.6 cases per 100,000 people). Twenty-one (55%) were female and four (10%) cases were hospitalized.

Shigellosis

In 2014, 21 cases of shigellosis were reported to the NDDoH, a 17 percent increase from the 18 cases reported in 2013 (**Figure 21**). Statewide shigellosis incidence was 2.9 cases per 100,000 people in 2014. Nine counties reported cases, with Sioux (158.0 cases per 100,000 people), Benson (29.1 cases per 100,000 people) and Wells (23.8 cases per 100,000) having the highest incidence of shigellosis.

Figure 21: North Dakota Shigellosis Case Counts by Year, 2005-2014



The median age of cases of shigellosis was 13 years (range: 2-72 years). Persons age 5-9 years had the highest age-specific incidence rate (10.7 cases per 100,000 people). Eleven (52%) were male. Five (23%) cases were hospitalized.

For more information about enteric infections and foodborne gastrointestinal illness, visit www.ndhealth.gov/disease/GI.

Table 4: Potential Risk Factors Among Enteric Cases, North Dakota, 2014

Risk factor (not mutually exclusive)	Number of Campylobacteriosis Cases (%)	Number of Cryptosporidiosis Cases (%)	Number of Giardiasis Cases (%)	Number of Salmonellosis Cases (%)	Number of STEC Cases (%)	Number of Shigellosis Cases (%)
Contact with animals	79 (65%)	77 (52%)	19 (48%)	42 (47%)	20 (52%)	5 (23%)
Contact with similarly ill person	13 (11%)	39 (26%)	5 (13%)	9 (10%)	4 (11%)	7 (33%)
Travel	22 (18%)	36 (24%)	8 (21%)	18 (20%)	5 (13%)	4 (19%)
Recreational water exposure	10 (8%)	17 (11%)	7 (18%)	2 (2%)	5 (13%)	3 (14%)
Drinking untreated water	11 (9%)	9 (6%) 4 (10%)	4 (10%)	1(1%)	2 (5%)	0 (0%)

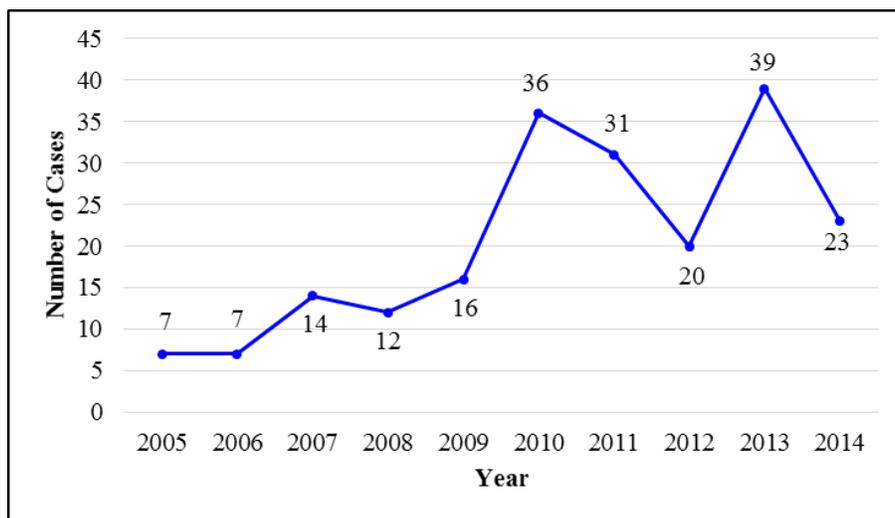
Zoonotic Diseases

Laura Cronquist, Vectorborne and Special Projects Coordinator

Tickborne Diseases

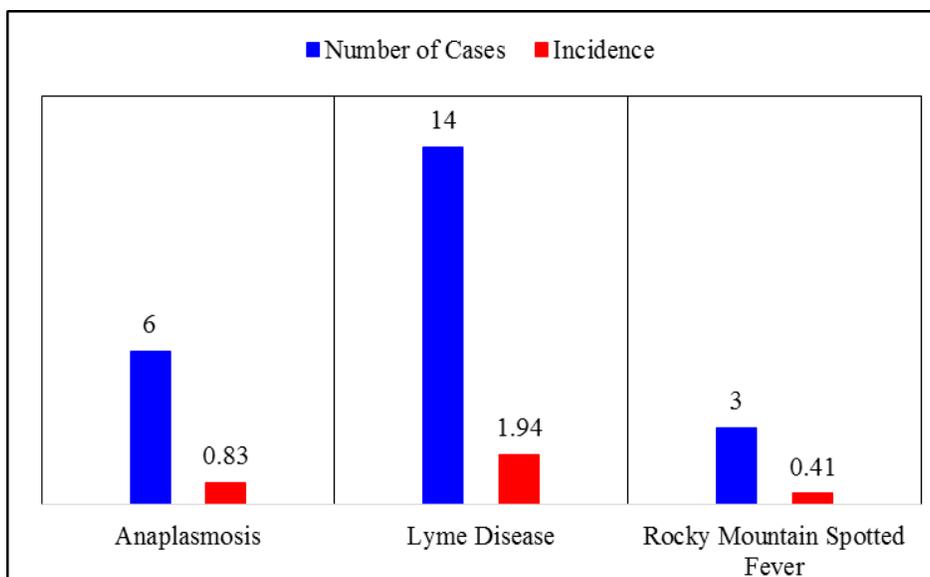
In 2014, 23 cases of tickborne diseases were reported to the NDDoH, a 41 percent decrease from the 39 cases reported in 2013 (**Figure 22**). Statewide, tickborne disease incidence was 3.2 cases per 100,000 people in 2014. Twelve counties reported cases, with Adams (42.4 cases per 100,000 people), Cavalier (25.7 cases per 100,000 people) and LaMoure (24.0 cases per 100,000 people) having the highest incidence of tickborne diseases.

Figure 22: North Dakota Tickborne Diseases Case Counts by Year, 2005-2014



Out of the 23 reported cases of tickborne diseases, the majority of the cases were Lyme Disease. There were no reported cases of Ehrlichiosis in 2014 (**Figure 23**).

Figure 23: North Dakota Tickborne Diseases Case Counts and Incidences, 2014

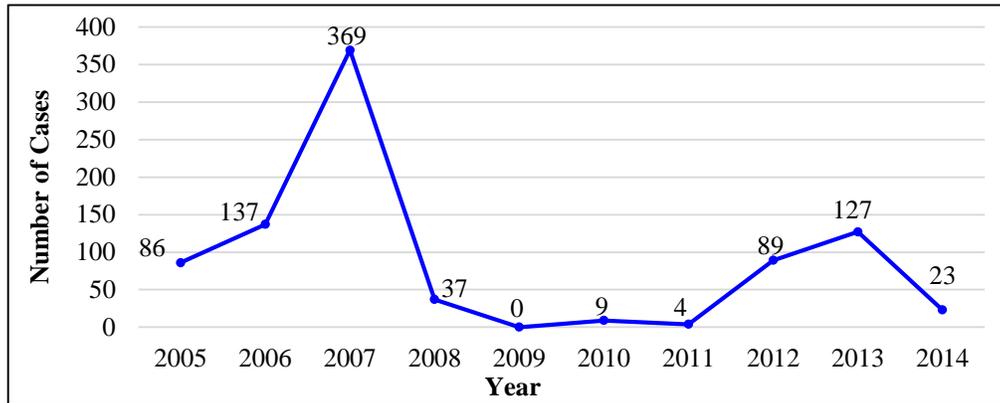


West Nile Virus (WNV)

In 2014, 23 cases WNV infection were reported to the NDDoH, an 82 percent decrease from 127 cases reported in 2013 (**Figure 24**). Statewide, WNV incidence was 3.2 cases per 100,000 people in 2014. Thirteen counties reported cases, with Emmons (57.4 cases per 100,000 people), Logan (51.4 cases per 100,000 people) and Hettinger (37.6 cases per 100,000 people) having the highest incidence of WNV.

The median age of WNV was 50 years (range: 19-85 years). Persons age 35-44 had the highest age-specific incidence rate (7.5 cases per 100,000 people). Thirteen (57%) of the reported cases were male and eight (35%) cases were hospitalized. There were twelve cases of neuroinvasive disease and eleven cases of West Nile fever. Two cases were fatal.

Figure 24: North Dakota West Nile Virus Case Counts by Year, 2005-2014

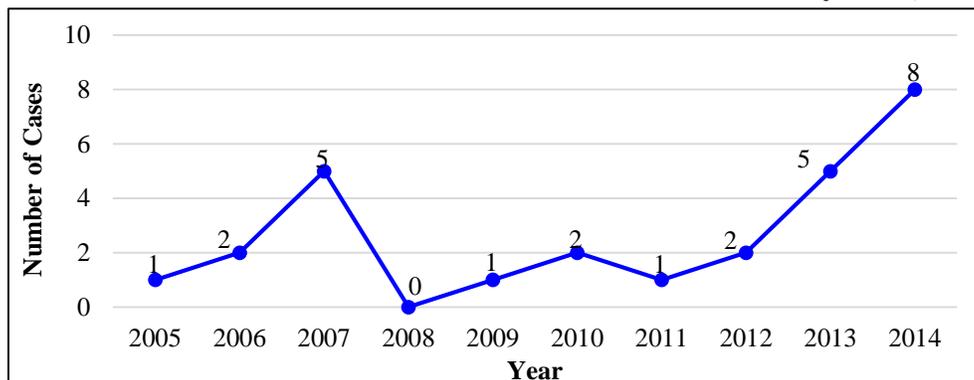


Other Arboviral Diseases (Chikungunya, Dengue, Malaria)

In 2014, eight cases of other arboviral diseases were reported to the NDDoH, an increase from five cases reported in 2013 (**Figure 25**). Statewide, arboviral incidence was 1.1 cases per 100,000 people in 2014. Four counties reported cases, with Richland (6.1 cases per 100,000 people), Grand Forks (2.9 cases per 100,000 people) and Burleigh (2.3 cases per 100,000 people) having the highest incidence of other arboviral diseases.

The median age of cases of other arboviral disease was 30.5 years (range: 17-61 years). Persons age 25-34 had the highest age-specific incidence rate (2.9 cases per 100,000 people). All cases were male and three cases were hospitalized.

Figure 25: North Dakota Other Arboviral Diseases Case Counts by Year, 2005-2014

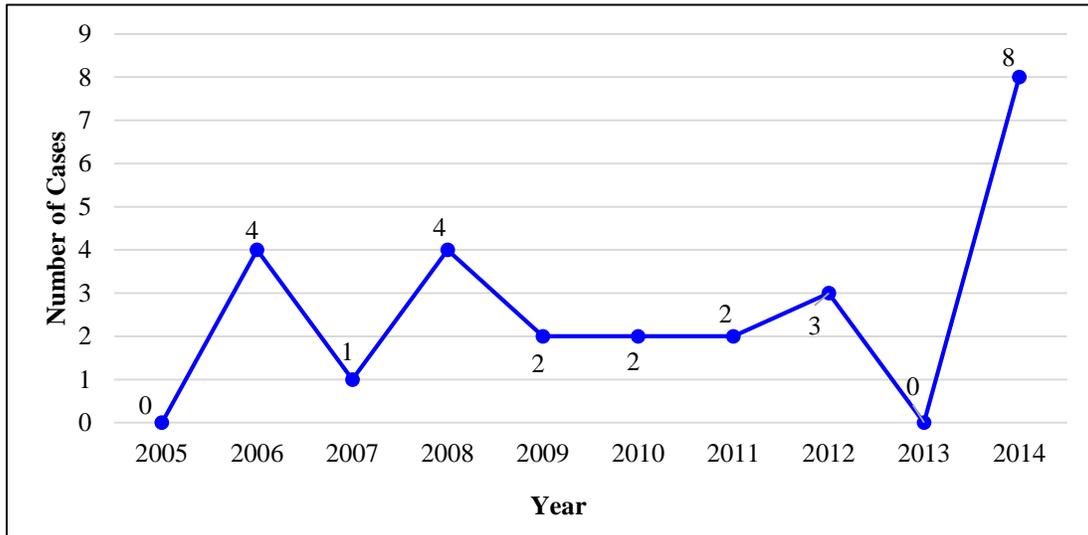


Note: There were no Dengue or Chikungunya cases reported in 2014. All previous data were from malarial infections imported from other countries.

Other Zoonotic Diseases (Brucellosis, Hantavirus, Tularemia, Q Fever)

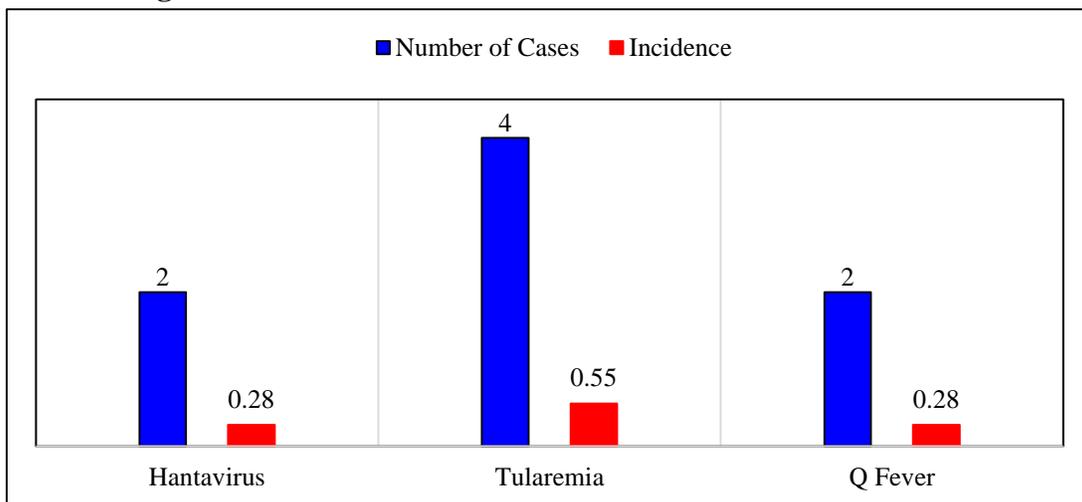
In 2014, eight cases of other zoonotic diseases were reported to the NDDoH, while no cases were reported in 2013 (**Figure 26**). Statewide, other zoonotic disease incidence was 1.1 cases per 100,000 people in 2014. Six counties reported cases, with Benson (43.6 cases per 100,000 people), Grant County (42.1 cases per 100,000 people) and Kidder (41.2 cases per 100,000 people) having the highest incidence of other zoonotic diseases.

Figure 26: North Dakota Other Zoonotic Diseases Case Counts by Year, 2005-2014



Most of the other reported zoonotic diseases were tularemia (**Figure 27**). No human brucellosis cases were reported.

Figure 27: North Dakota Other Zoonotic Diseases Case Counts

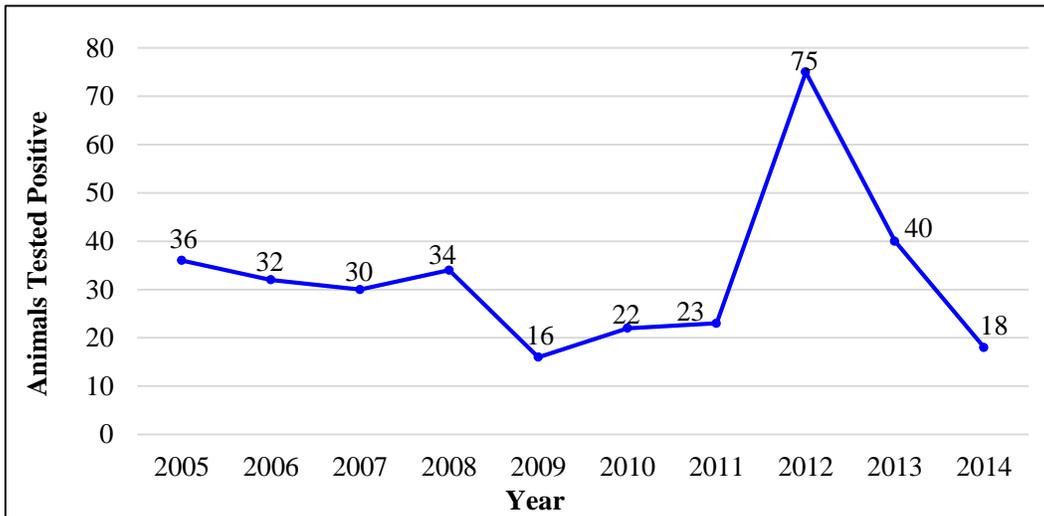


The median age of cases of other zoonotic diseases was 29.5 years (range: 9-62 years). Persons aged 25-34 years had the highest age-specific incidence rate (2.9 cases for every 100,000 people). All cases were male, and seven cases were hospitalized. One case was fatal.

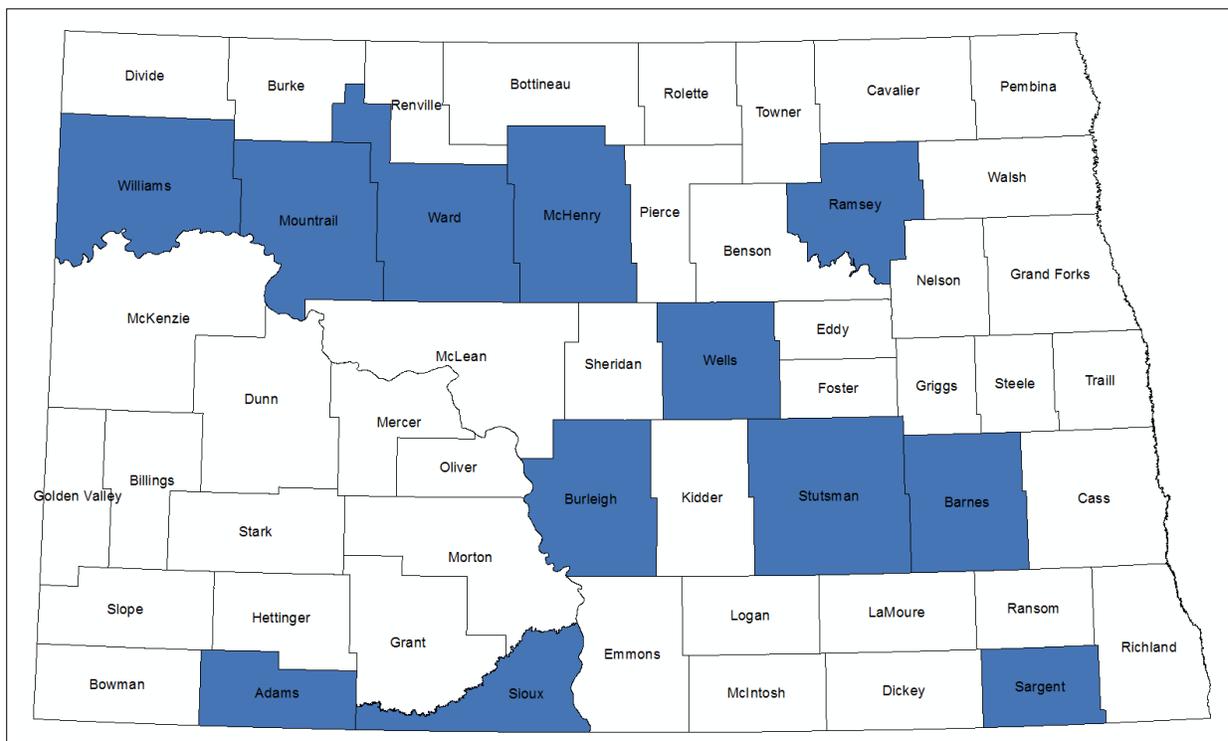
Animal Rabies

In 2014, 18 animals tested positive for rabies out of a total 694 animals tested, a decrease from the 40 animals that tested positive in 2013 (**Figure 28**). Animals from 12 counties tested positive (**Map 1**). There were no human cases of rabies in 2014. Most of the reported positive cases were skunk specimens (12), while other animals that tested positive included cows (3), cats (2), and bats (1).

Figure 28: Animal Testing Positive for Rabies by Year, 2005-2014, North Dakota



Map 2: Counties with Animals Testing Positive for Rabies



Largest Ebola Outbreak in History

On March 23, 2014, the World Health Organization's African Regional Office reported an outbreak of Ebola virus disease in Guinea, which quickly spread to two additional countries, Liberia and Sierra Leone.

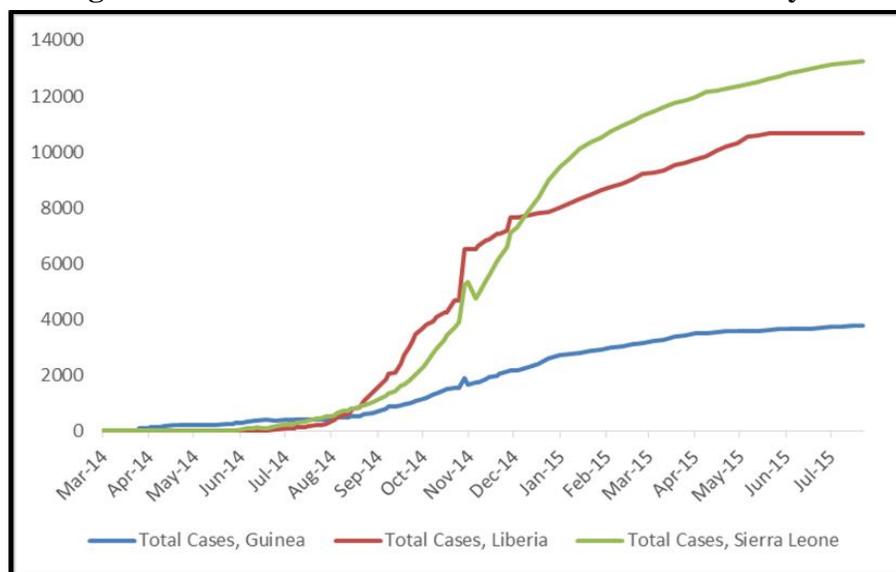
The Ebola outbreak in West Africa is ongoing. As of July 26, 2015, a total 27,786 confirmed and suspect cases have been reported from 10 countries, including the United States. Of these 27,786 cases, 15,212 (55%) have been laboratory confirmed and 11,294 (41%) have died. Cases continue to be reported from Guinea and Sierra Leone. On May 9, 2015, the outbreak was declared over in Liberia, but on June 29 a new case was identified, along with six additional contacts. Enhanced surveillance continues in Liberia to ensure no additional spread is occurring.

The first imported case of Ebola diagnosed in the United States was confirmed on September 30, 2014. The patient was not ill during the flights from West Africa, but developed symptoms several days later. The patient developed symptoms on September 24, and sought medical care at a Texas hospital on September 26 but was sent home. The patient sought medical care again on September 28 and was admitted to the hospital with symptoms consistent with Ebola infection and was put into isolation. Laboratory testing later confirmed the diagnosis of Ebola. This patient died due to complications of his Ebola infection.

Two healthcare workers who cared for this patient became infected with Ebola. Both were hospitalized and recovered. However, one of the healthcare workers traveled by air from Dallas to Cleveland on October 10 and from Cleveland to Dallas on October 13 while symptomatic, so all crew and passengers were interviewed and monitored by their respective state health departments. By November 3, all passengers on both flights completed the 21-day monitoring period, with no further cases identified.

A fourth case was identified in New York City. This person was a medical aid worker who had returned to NYC from Guinea. The aid worker became ill in October, was hospitalized and recovered. **Figure 29** is a graph of cases identified in Guinea, Liberia and Sierra Leone from March 2014 to July 2015.

Figure 29: West African Ebola Cases March 2014-July 2015.



In August 2014, the NDDoH worked with local colleges around the state to help develop protocols for monitoring students who may be coming to North Dakota from the three Ebola affected countries. The schools began monitoring students from these countries for fever and symptoms upon their arrival at the campus.

Additionally, NDDoH worked with local hospitals and EMS personnel around the state to develop protocols for identifying and caring for travelers who may arrive in North Dakota from the three Ebola affected countries. All hospitals in the state began preparing triage and infection control protocols for the initial care of these travelers; and two hospitals volunteered to be the Ebola treatment centers for the full time care and treatment of Ebola patients.

In October 2014, travel manifests were made available to health departments across the country to aid in the identification and monitoring of travelers from the three affected West African countries. On October 10, the NDDoH began monitoring travelers from Guinea, Liberia and Sierra Leone for fever and illness. As of July 27, 2015, a total of 95 people have been or are being monitored for development of signs or symptoms of Ebola. This means that daily communication between the traveler and public health is required. The traveler checks his/her temperature and symptoms twice a day and reports those results to the NDDoH either by phone or email. To date, there have been no travelers who have reported any high risk exposures, such as providing health care to an Ebola patient or having a known exposure or direct contact with infected bodily fluids. All travelers to North Dakota have been in the “Low but Not Zero” category.

Additionally, North Dakota’s Epidemiology Intelligence Service (EIS) officer, Dinorah Calles, was called to duty twice and deployed overseas to Africa to help with the outbreak. Each deployment lasted about 30 days, and during her time there, she aided in the gathering and analysis of data collected on both patients and contacts. Here she is pictured below (third from the left) with other colleagues in Guinea who were featured in a CDC video about “getting to zero” cases of Ebola. This video can be found on the CDC’s Facebook page at www.facebook.com/CDC/videos/10152918241651026/?pnref=story



The NDDoH also offered webcasts, conference calls and training opportunities to area hospitals, schools and businesses. For more information on Ebola, visit www.ndhealth.gov/disease/Ebola or www.cdc.gov/vhf/ebola/index.html.

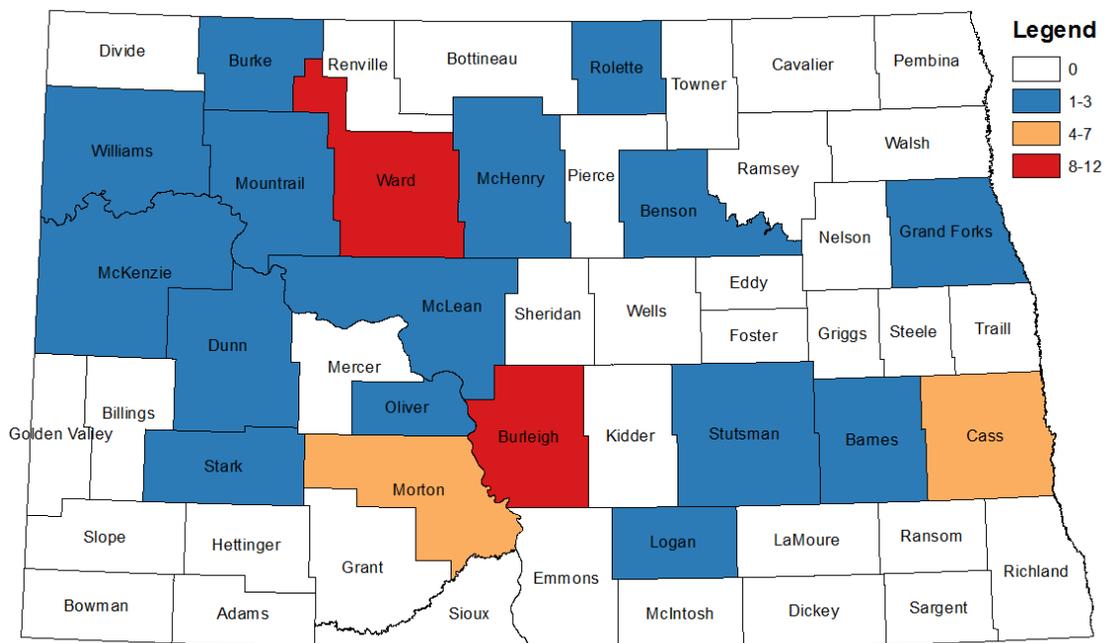
Carbapenem-resistant Enterbacteriaceae

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.

Resistance to carbapenems can occur by different mechanisms. One of the more common ways that Enterobacteriaceae become resistant to carbapenems is through the production of *Klebsiella pneumoniae* carbapenemase (KPC). KPC is an enzyme that is produced by some CRE, and was first identified in the United States around 2001. 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. In addition to KPC, other enzymes, such as NDM (New Delhi Metallo-beta-lactamase), VIM (Verona integron–encoded metallo-β-lactamase), and IMP (imipenem-hydrolyzing β-lactamases), can breakdown carbapenems and lead to the development of CRE, but they are uncommon in the United States.

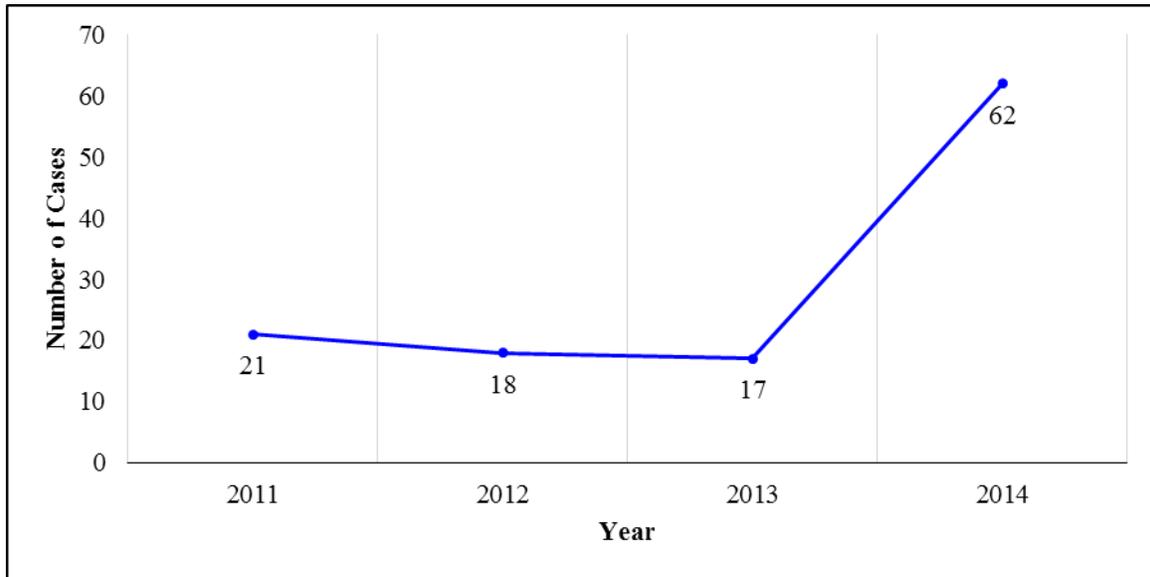
Healthy people usually do not get CRE infections. In healthcare settings, CRE infections most commonly occur among patients who are receiving treatment for other conditions. Patients whose care requires devices like ventilators (breathing machines), urinary (bladder) catheters, or intravenous (vein) catheters, and patients who are taking long courses of certain antibiotics are most at risk for CRE infections.

Map 3: CRE Case Counts in North Dakota by County, 2014



In 2014, 62 (**Map 3**) cases of CRE infections were reported to the NDDoH, a 264.7 percent increase from the 17 cases reported in 2013 (**Figure 30**). Statewide in North Dakota, CRE infection incidence was 8.6 cases per 100,000 people in 2014. Nineteen counties reported cases, with Oliver (53.4 cases per 100,000 people), Logan (51.4 cases per 100,000 people), and Dunn (48.1 cases per 100,000 people) having the highest incidence of CRE cases.

Figure 30: North Dakota CRE Case Counts by Year, 2011-2014



In 2014, the Department investigated an *Enterobacter cloacae* CRE cluster in a healthcare facility. Chart extraction was conducted and staff in-servicing was held. Staff and procedure observations were completed, and additional prevention measures were implemented and monitored, which decreased the number of new cases identified.

Clinicians play a critical role in slowing the spread of CRE. Rapidly identifying and reporting patients colonized or infected with these organisms and placing them in contact precautions when appropriate, using antibiotics wisely, minimizing device use, and implementing regional and facility-based interventions are all important for preventing CRE transmission.

HIV/STD/TB/ Viral Hepatitis Programs

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

The HIV Surveillance program data are summarized 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 North Dakota 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:

- Monitor the incidence and estimated prevalence of STDs in the state; diseases that are monitored include chlamydia, gonorrhea and syphilis
- Utilize surveillance data to better characterize STD risks and identify disproportionately affected populations
- Assess the risks for STD infection and develop effective STD prevention programs; these programs include partner notification and linkage to care.
- Justify 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 Pritchet, HIV Surveillance Coordinator

HIV/AIDS Diseases

North Dakota traditionally ranks near the bottom for incident cases each year of human immunodeficiency virus (HIV/AIDS) in the United States. In 2014, the incident case rate was of 3.6 per 100,000 people.

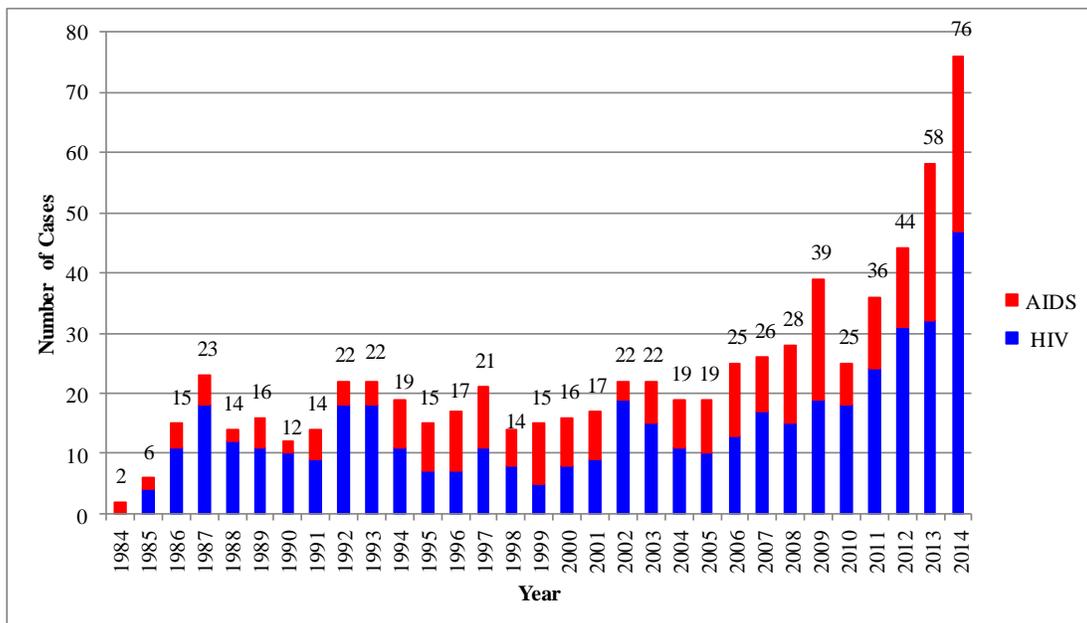
In 2014, 76 HIV/AIDS cases were reported to the NDDoH. This count includes cases being diagnosed for the first time in the state and cases previously diagnosed elsewhere who moved to North Dakota during the year.

In 2014, 26 North Dakota residents were diagnosed with HIV/AIDS and reported to the NDDoH. Five of the newly diagnosed HIV cases were advanced enough to meet the case definition for AIDS at the time of diagnosis. Eighty-one percent of HIV/AIDS cases reported in 2014 were male. Males accounted for 80 percent of estimated new HIV infection in the United States in 2014.

Cumulative (1984-2014) HIV/AIDS Cases

HIV and AIDS have been reportable conditions in North Dakota since 1984. The cumulative reported infections as of December 31, 2014, are 719 HIV/AIDS cases; 448 were reported with HIV status and 271 as AIDS.

Figure 31: HIV/AIDS diagnosed in North Dakota and HIV/AIDS previously diagnosed in other states by year. 1984-2014



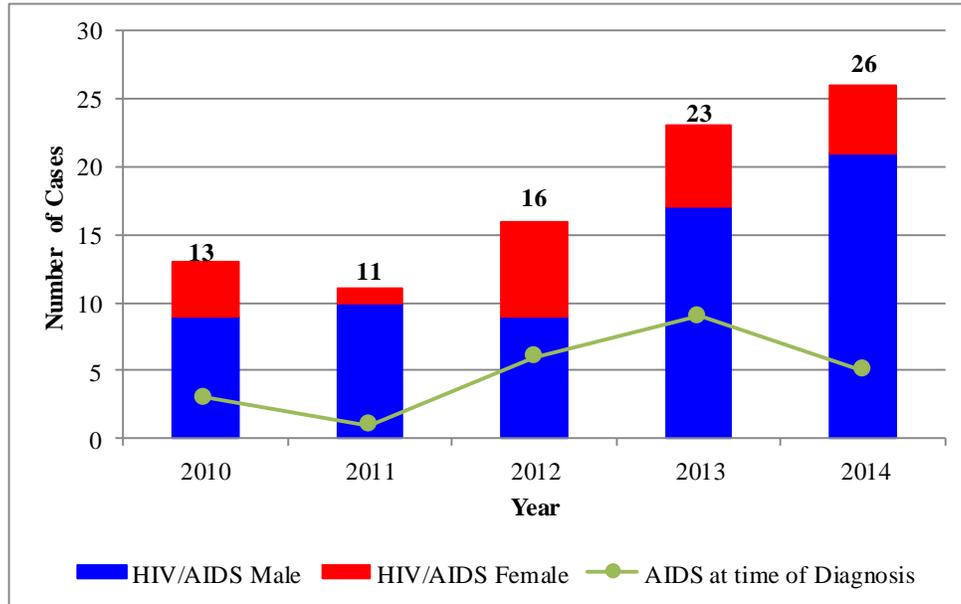
Of the 397 HIV/AIDS cases that were currently living in North Dakota at the end of 2014:

- 74 percent were male and 26 percent female
- 73 percent have HIV and 27 percent have progressed to AIDS
- 60 percent were between the ages of 25 and 44 at diagnosis
- 57 percent were white, 6 percent were American Indian, 32 percent were black, 1.5 percent was Asian and 5 percent were Hispanic (all races)

HIV/AIDS Incidence: 2010-2014

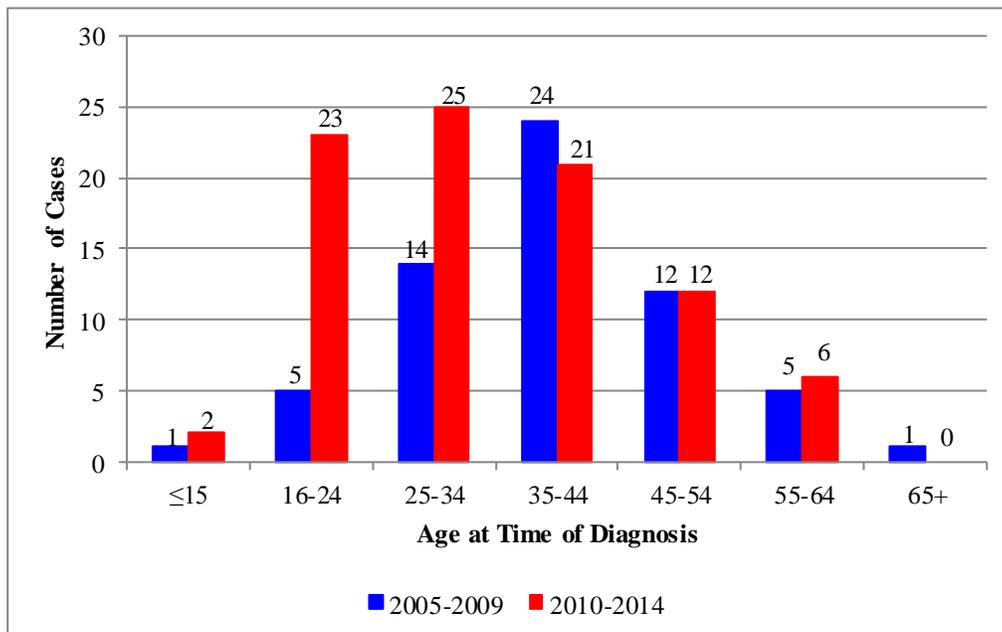
HIV/AIDS incidence refers to cases that were diagnosed for the first time in North Dakota within a given time frame. The AIDS cases reported in this section met the criteria for AIDS at first diagnosis. From 2010 to 2014, 89 HIV/AIDS cases were diagnosed in North Dakota. Twenty-seven percent met the criteria for AIDS at time of diagnosis, while 73 percent were diagnosed as only being infected with HIV; 74 percent were male and 26 percent were female.

Figure 32: Cases by Gender and AIDS Status at time of Diagnosis, 2014



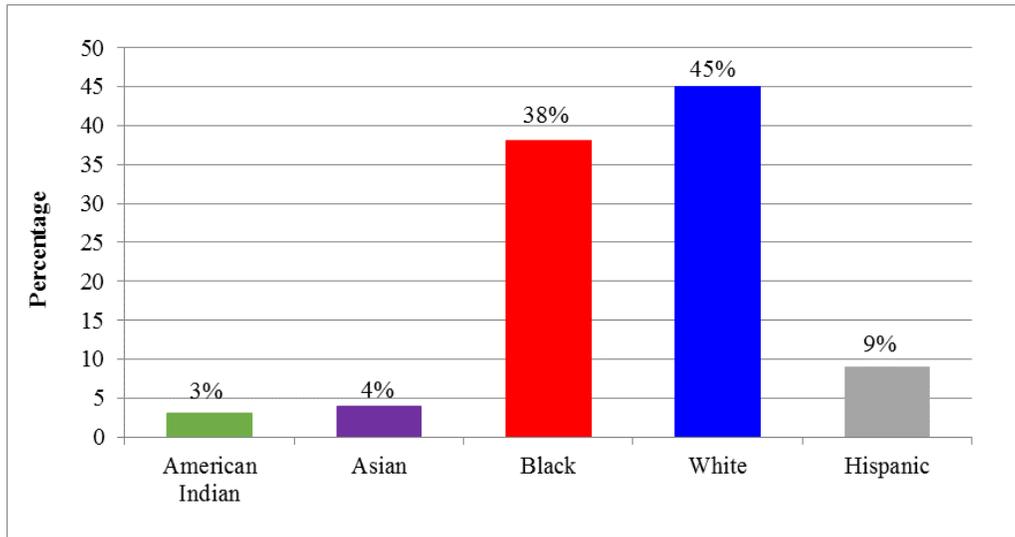
The age groups of HIV/AIDS cases diagnosed for the first time in North Dakota between 2010 and 2014 are shown below in **Figure 33**. HIV/AIDS is being diagnosed at an earlier age; the 16 to 34 age group made up the largest proportion of the HIV/AIDS cases (54%) diagnosed during that time period.

Figure 33: Incidence Age of HIV/AIDS cases diagnosed in N.D. 2010 – 2014



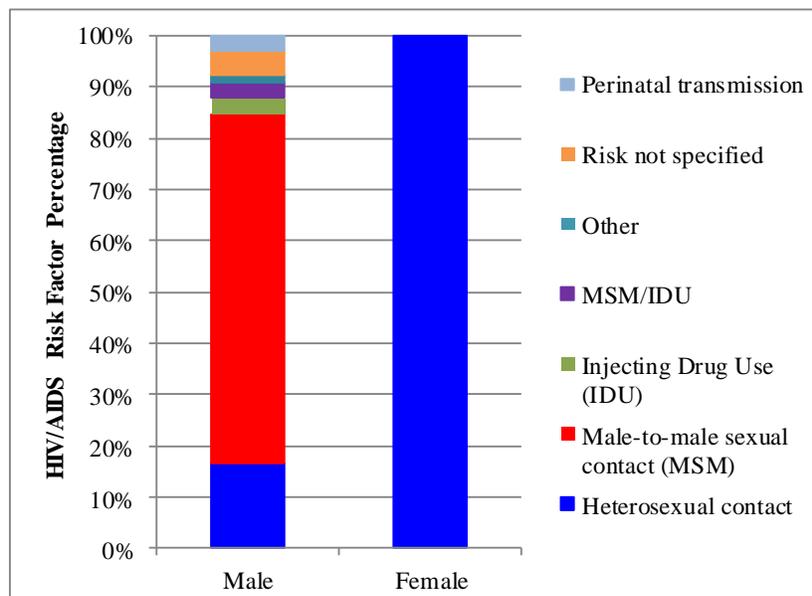
Racial and ethnic minorities disproportionately continue to be affected by HIV in the United States and North Dakota. Blacks represent approximately 12 percent of the United States population, but accounted for an estimated forty-four percent of new HIV infections in 2010. Thirty-eight percent of HIV/AIDS cases diagnosed in North Dakota between 2010 and 2014 were Black/African American, whereas the population estimates in 2013 indicate 1.8 percent of the population were of this race.

Figure 34: Race/Ethnicity for cases diagnosed in 2010-2014



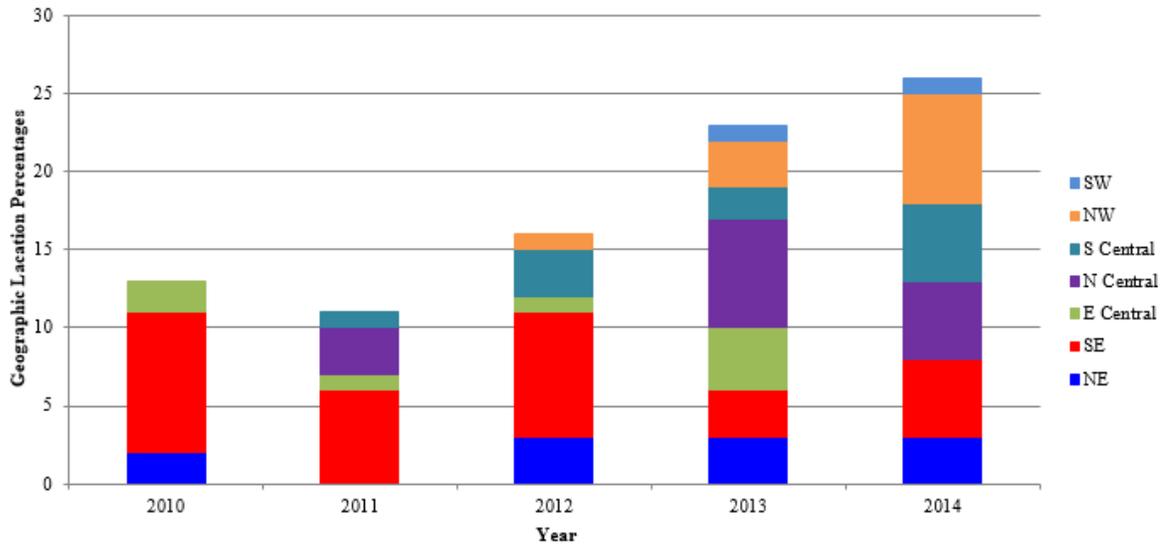
Male-to-male sex continues to be the most frequently reported risk factor. Sixty-eight percent of the cases diagnosed between 2010 and 2014 reported to have male-to-male sexual relations. Seventeen percent of the cases diagnosed during this time period reported having heterosexual relations. Three percent of the cases reported using intravenous drugs, and three percent reported using intravenous drugs and had male-to-male sexual relations. Risk factors of HIV/AIDS cases diagnosed in North Dakota for 2010-2014 stratified by gender is shown in **Figure 35**.

Figure 35: Risk factors of HIV/AIDS cases diagnosed in ND by Gender, 2010-2014

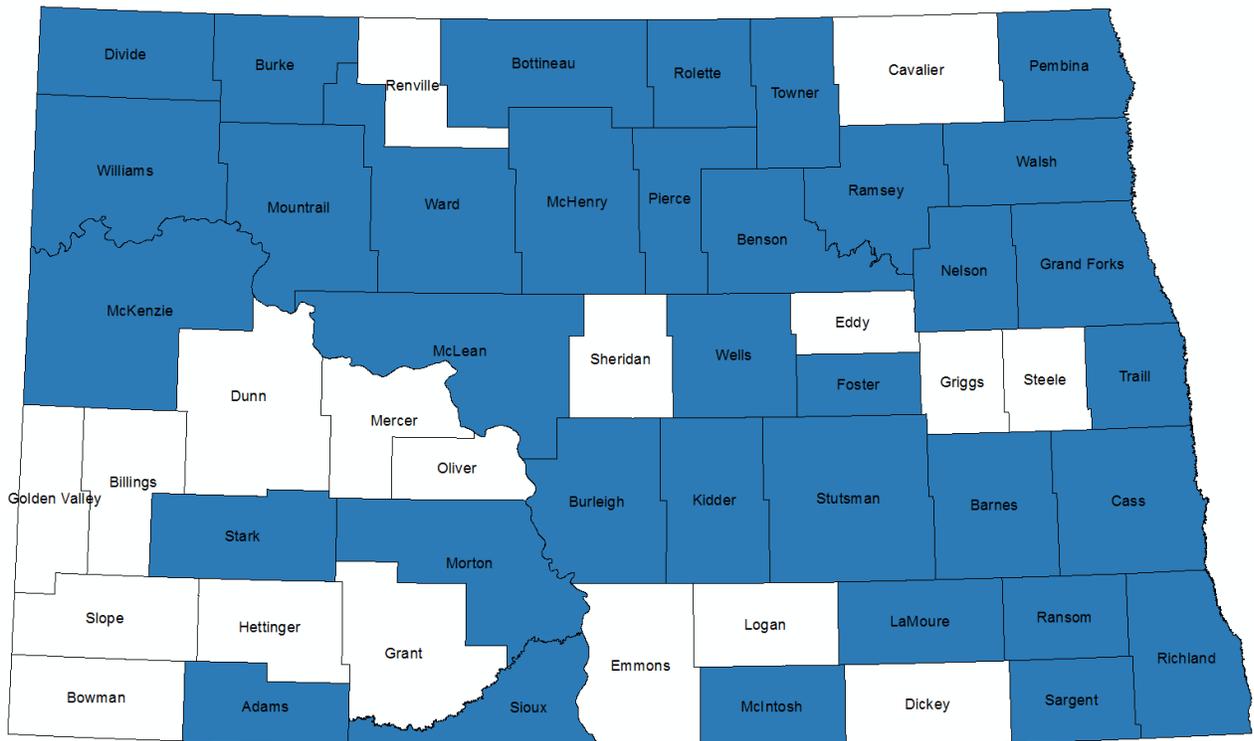


The population in North Dakota has grown from 672,591 in 2010 to 739,482 in 2014 (estimated), in part due to the oil activity in the western half of the state. In 2010, 80 percent of HIV cases were diagnosed in the eastern third of North Dakota; in 2014 the number of new HIV/AIDS diagnosed in the eastern third of the state decreased to 31 percent.

Figure 36: Geographic location of newly identified HIV/AIDS cases diagnosed in 2010-2014



Map 4: Geographic location of at least one HIV/AIDS case currently living in North Dakota, 2014



Tuberculosis

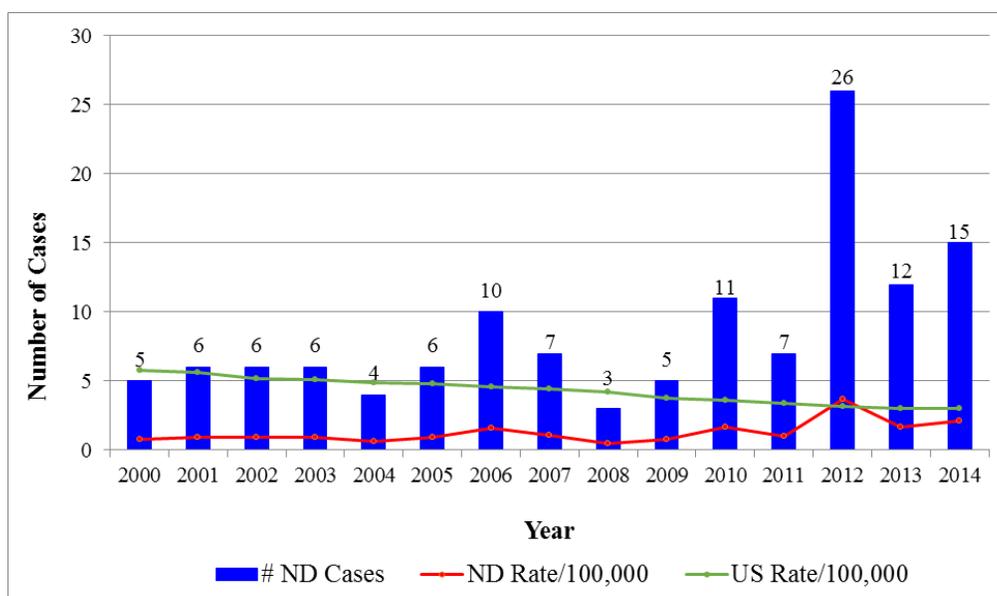
Dee Pritchet, TB Coordinator

Tuberculosis (TB)

In North Dakota in 2014, there were 15 cases (2.0 cases per 100,000 people) of infectious tuberculosis (active) identified and 544 cases of tuberculosis infection only (latent). In 2014, the United States saw a 2.2 percent decrease in cases, the slowest decrease in more than ten years, with a total of 9,412 cases of infectious tuberculosis (3.0 cases per 100,000 people).

North Dakota's incidence rate historically has been lower than the national rate, but an outbreak in Grand Forks County increased the incidence rate to 3.7 per 100,000 people in 2012. TB cases continue to be linked to the outbreak in Grand Forks County. In 2014, four cases linked to this outbreak were reported. The North Dakota incidence rate of 2.1 cases per 100,000 people in 2014 is below the United States rate of 3.0 cases per 100,000 people. (Figure 37).

Figure 37: North Dakota Cases: U.S. and ND Tuberculosis Disease Rates, 2000–2014

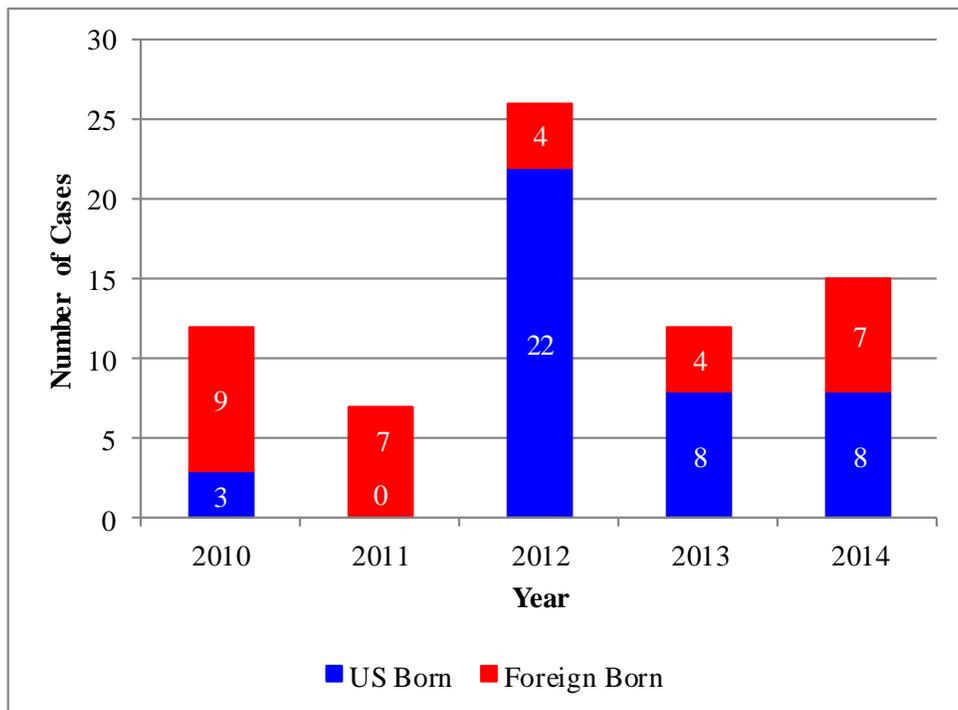


5-Year Trends

Between 2010 and 2014, 72 cases of active TB were reported in North Dakota; 41 of the cases were United States born (57%) and 31 cases were foreign born (43%). During the five-year time period, there were 39 male cases and 33 female cases. In the last five years, 45 of the 72 cases were pulmonary (73%), 19 were extra-pulmonary (31%) and five cases (8%) had both pulmonary and extra-pulmonary TB.

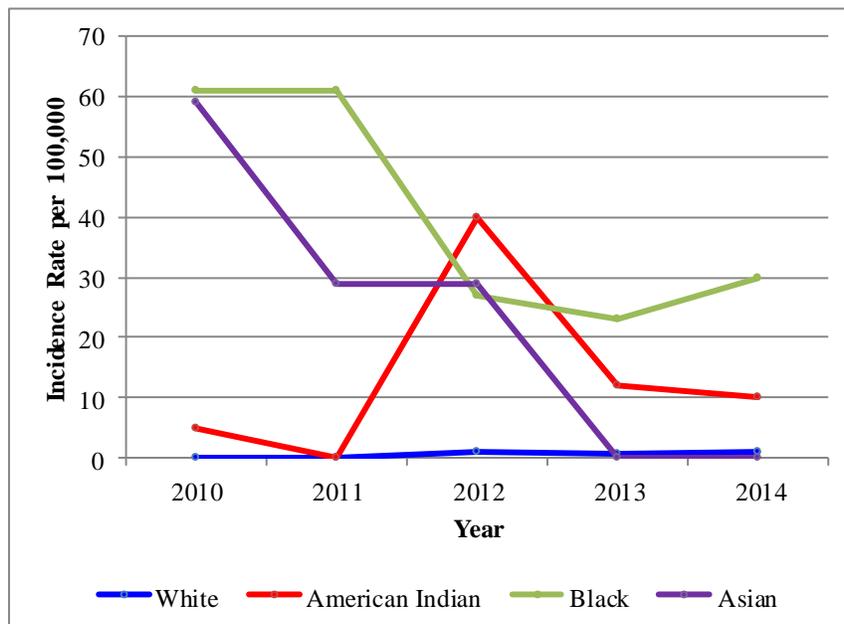
In 2014, 47 percent of reported TB cases in North Dakota occurred among foreign born persons; the case rate (35.8 cases per 100,000 people) exceeded the United States incidence rate of 15.3 per 100,000 people for all foreign born populations. Fifty-three percent of reported TB cases in North Dakota occurred in United States born persons; the case rate (1.0 cases per 100,000 people) is slightly less than the United States incidence rate of 1.1 per 100,000 people.

Figure 38: Number of active TB cases reported in North Dakota, 2010-2014



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 2014, the North Dakota incident rate for whites was 1.0 per 100,000 people, which exceeded the United States rate of 0.7 per 100,000 people, as did incident rates for Native Americans at 10.0 per 100,000 cases (United States 5.4 per 100,000 people) and Blacks at 30.7 per 100,000 (United States 5.1 per 100,000 people). (Figure 39).

Figure 39: Tuberculosis Cases by Race/Ethnicity, North Dakota, 2010-2014

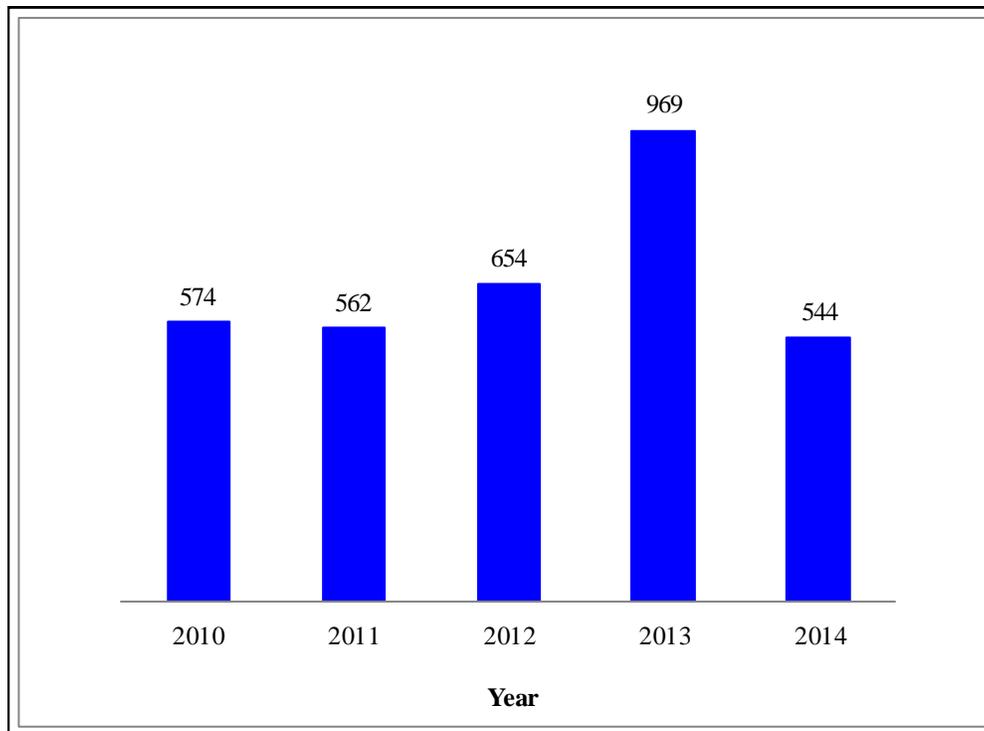


The NDDoH confirmed its first case of multidrug-resistant tuberculosis (MDR TB) in 2014. Ninety-five (1.4% of the total number of active TB) cases of MDR TB were reported in the United States in 2013. Since 1997, for United States born culture positive cases in the United States that have initial drug susceptibility testing results available, the percentage of cases that are MDR TB has remained below 1.0 percent. Of the total number of reported MDR TB cases, the proportion occurring among foreign born persons increased from 30.8 percent (149 of 484) in 1993 to 89.5 percent (85 of 95) in 2013.

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 **Table 5**.

Table 5: Reported Cases of LTBI North Dakota, 2010-2014



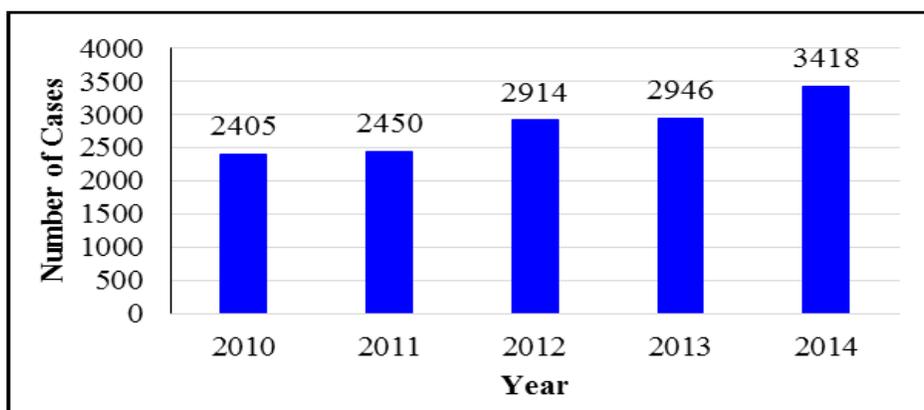
Sexually Transmitted Diseases

Sarah Weninger, STD Coordinator

Chlamydia

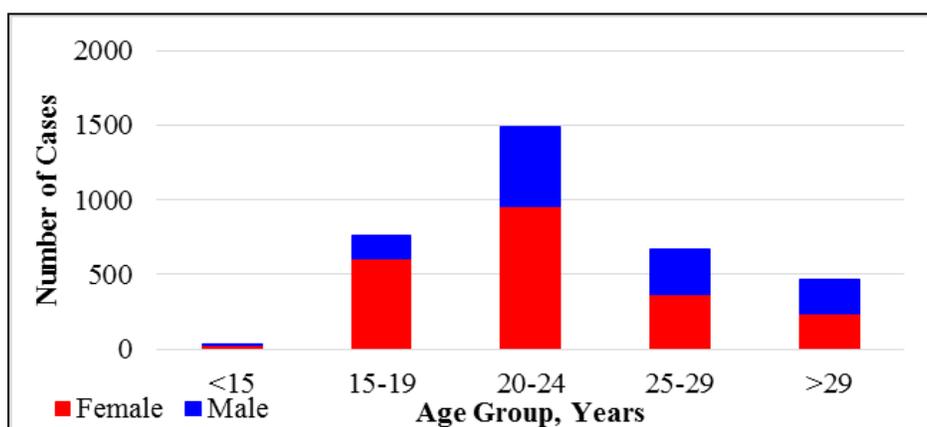
In 2014, 3,418 cases of chlamydia were reported to the NDDoH, a 16 percent increase from the 2,946 cases reported in 2013 (**Figure 40**). The case count reported in 2014 corresponds to a rate of 472 per 100,000 people. The North Dakota rate has increased 26 percent over the past five years, whereas the United States rate, 446 per 100,000 people reported in 2014, is the first time since national reporting began that the rate of reported cases of chlamydia has decreased.

Figure 40: Chlamydia Cases by Year, North Dakota, 2010-2014



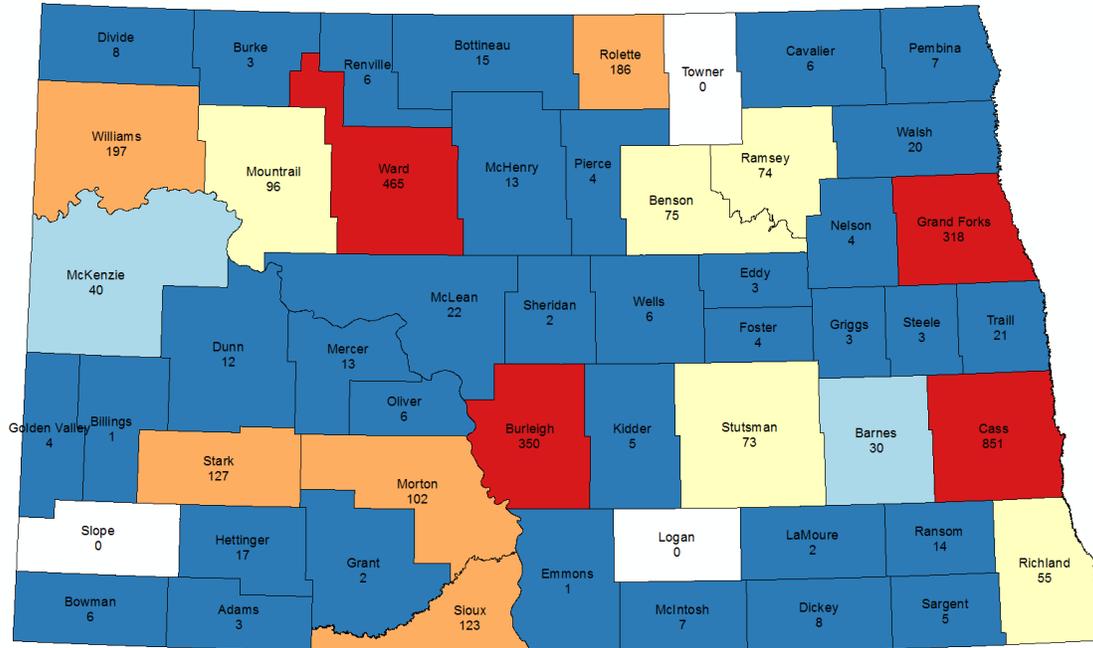
Of the cases reported in 2014, 2,184 (64%) were reported in females. The majority, 66 percent, of chlamydia cases were reported in people ages 15 to 24 (**Figure 41**).

Figure 41: Chlamydia Cases by Age Group and Gender, North Dakota, 2014



In 2014, 18 percent of chlamydia cases were reported with an unknown race. Of cases with known race, 1,818 (65%) cases were reported among whites, followed by American Indians with 674 (24%), Black/African Americans with 247 (9%), Hispanics with 146 (5%) and Asians with 34 (1%). Black/African Americans saw the largest increase (28%) in 2014.

Map 5: North Dakota Chlamydia Cases by County, 2014



Counties reporting the highest chlamydia rates in North Dakota are Rolette (1,474 per 100,000 people), Sioux (1,241 per 100,000 people), Benson (1,090 per 100,000 people) and Mountrail (1,023 per 100,000 people). These rates are higher than the rate of 407 per 100,000 for all of North Dakota. An additional four counties, Hettinger, Ward, Williams and Cass, have chlamydia rates higher than the overall North Dakota rate.

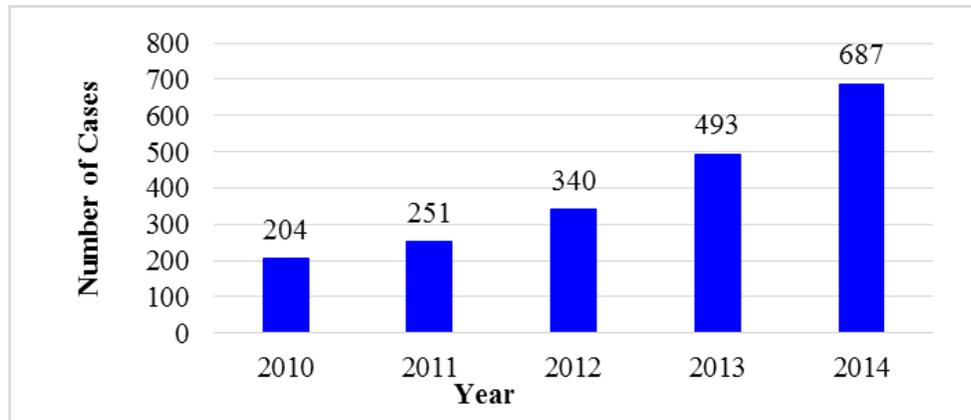
Table 6: Epi Facts of ND Chlamydia Cases, 2014

Where are cases being diagnosed?	Chlamydia cases in 2014 diagnosed 57% at private clinic/hospital; 23% at family planning/pregnancy clinics; 12% at tribal/HIS facilities, and 8% at other facilities.
How many people are being treated?	101 (3%) chlamydia cases were <u>not treated</u> and 37 cases were treated inappropriately.
How many cases were interviewed?	Only 42 percent of chlamydia cases were reported as being interviewed. <i>Reminder: 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.</i>
How many partners were tested and treated?	682 partners (0.2 partners/case) were identified for partner services. Of those partners, only 47 percent were treated and 18 percent were infected with chlamydia.
What are the risk factors for getting chlamydia?	For cases with risk factor information, 55 percent reported never or not often condom use, 44 percent reported sex while high or intoxicated, 14 percent reported having anonymous sex partners, and 64% reported having more than one partner in the previous 12 months.
How many were also tested for HIV?	Only 23% 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

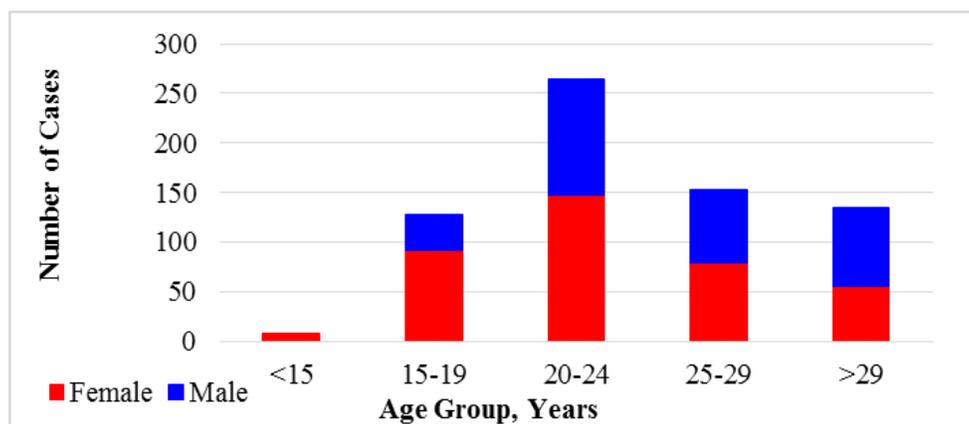
In 2014, 687 cases of gonorrhea were reported to the NDDoH, a 39 percent increase from the 493 cases reported in 2013 (**Figure 42**). The case count reported in 2014 corresponds to a rate of 95 per 100,000 people. The North Dakota rate has tripled over the past five years, whereas the United States rate has only increased 8.2 percent overall from 2009 to 2013. The 2014 North Dakota rate is only slightly below the 2013 United States rate of 106 per 100,000 people.

Figure 42: Gonorrhea Cases by Year, North Dakota, 2010-2014



Of the cases reported in 2014, 380 (55%) were reported in females. The majority, 61 percent, of gonorrhea cases were reported in people ages 20 to 29 (**Figure 43**). The median age of male gonorrhea cases in 2014 was 25, compared to 22 for female cases.

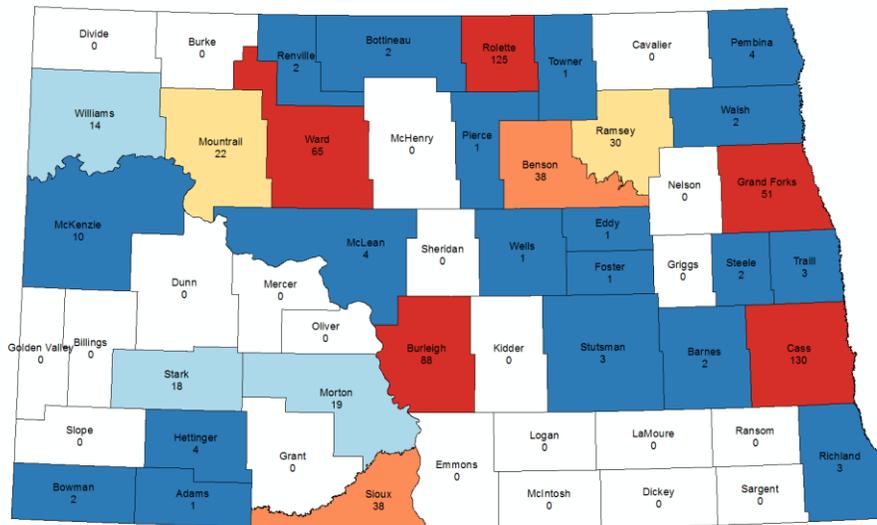
Figure 43: Gonorrhea Cases by Age Group and Gender, North Dakota, 2014



In 2014, 14 percent of gonorrhea cases were reported with an unknown race. Of cases with known race, 278 (47%) cases were reported among American Indians, followed by whites with 242 (41%) and Black/African Americans with 67 (11%). Black/African Americans saw the largest increase (72%) in 2014, followed by a 54 percent increase in cases reported in American Indians.

The rate of gonorrhea in North Dakota is an average of five times higher among minority populations compared to the average? North Dakota rate. In 2014, the highest rate was reported in American Indians, North Dakota's largest minority population, at 705 per 100,000 people. Among Black/African Americans, the rate was 511 per 100,000 people. In contrast, the 2014 rate among whites was 37 per 100,000 people.

Map 6: North Dakota Gonorrhea Cases by County, 2014



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.

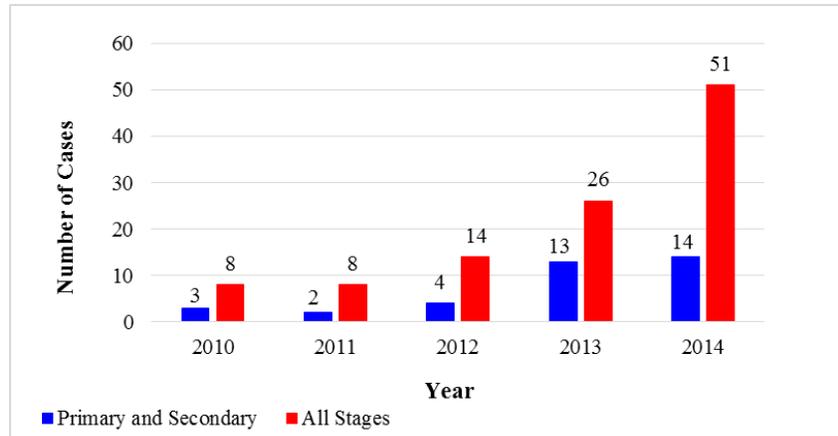
Table 7: Epi Facts of North Dakota Gonorrhea Cases, 2014

Where are cases being diagnosed?	Gonorrhea cases in 2014 diagnosed 50% at a private clinic/hospital; 29% at tribal/HIS facilities, 15% at family planning/pregnancy clinics, and 6% at other facilities.
How many people are being treated?	66 (9.6%) cases were treated <u>inappropriately</u> . <i>Reminder: the appropriate treatment for gonorrhea is dual therapy of 1 gram azithromycin and 250mg IM ceftriaxone.</i>
How many cases were interviewed?	62% of gonorrhea cases were reported as being interviewed.
How many partners were tested and treated?	220 partners (0.32 partners/cases) were identified for partner services. Of those partners, only 41 percent were treated. Almost 50 percent of the partners were unable to be located for notification and treatment.
What are the risk factors for getting gonorrhea?	For cases with risk factor information, 51 percent reported never or not often condom use, 44 percent reported sex while high or intoxicated, 26 percent reported having anonymous sex partners, and 71 percent reported having more than one partner in the previous 12 months. Eighteen percent of individuals who reported their total number of partners for the past 12 months reported having five or more partners in that time period.
How many were also tested for HIV?	Only 35% of gonorrhea cases were reported as being tested for HIV. All gonorrhea cases should be tested for HIV at time of diagnosis.

Syphilis

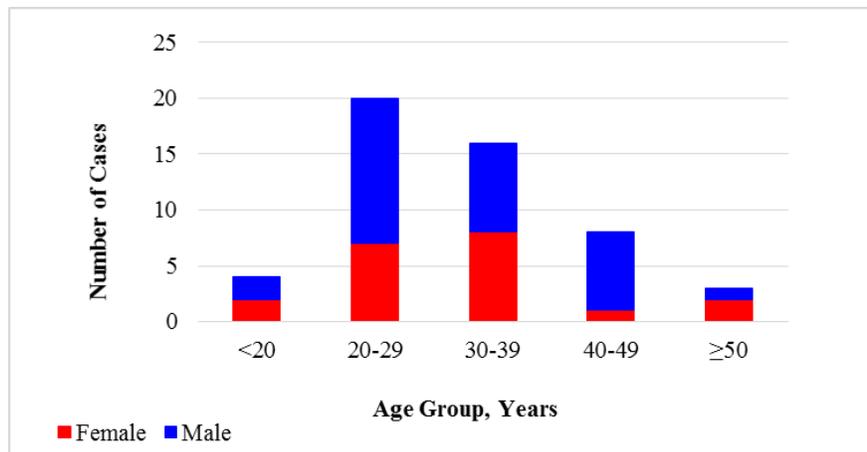
In 2014, there was a significant increase in the number of syphilis cases reported in North Dakota (**Figure 44**). Although the same number of primary and secondary cases were reported in 2013 and 2014, the total number of syphilis cases increased by 96 percent since 2013. The number of syphilis cases is five times higher in 2014 than it was five years ago. Over the past five years, the number of syphilis cases may be increasing in North Dakota, but the 2014 rate of primary and secondary syphilis, 1.8 per 100,000 people, is still lower than the United States rate of 5.5 per 100,000 people.

Figure 44: Reported Syphilis Cases in North Dakota, 2010-2014



Of the primary and secondary cases reported in North Dakota, 61 percent were male. The median age was 30 years, with an age range of 16 to 56 years. The highest syphilis rate occurred among American Indians at 78 per 100,000 people. The second highest rate occurred among Black/African Americans at 45 per 100,000 people, followed by 1 per 100,000 people among whites. The North Dakota syphilis rate in 2014 was 7 per 100,000 people.

Figure 45: Reported Syphilis Cases in North Dakota by Age and Gender, 2014

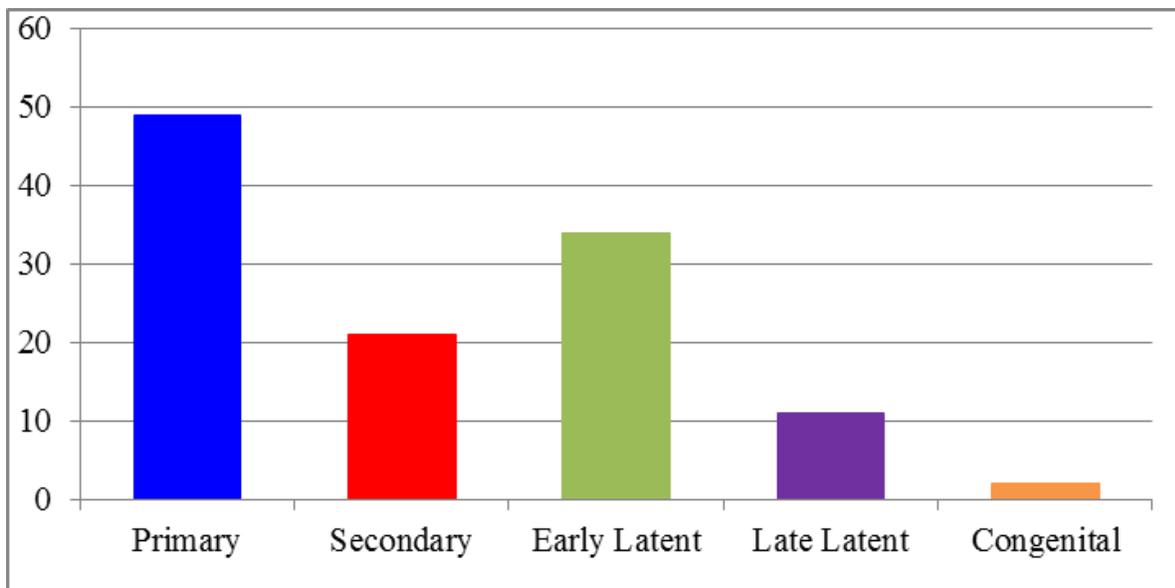


In the United States, 75 percent of primary and secondary syphilis cases occurred in men who have sex with men (MSM). In North Dakota, only 19.6 percent of all syphilis cases reported as MSM. Syphilis cases in North Dakota are being diagnosed in heterosexual individuals. Other risk factors that cases reported included having sex while high or intoxicated (53%) and have anonymous sex partners (32%). Of cases that were identified as MSM, 62.5 percent reported having sex with anonymous partners and 29 percent reported meeting partners on the internet.

Multi-State Outbreak of Syphilis

North Dakota and South Dakota continued to investigate and collaborate on a multi-state syphilis outbreak in 2014. The outbreak began in 2013 and continued through 2014. The majority of cases in this outbreak occurred in the spring and early summer of 2014. A total of 117 cases have been reported in this outbreak from January 1, 2013, through December 31, 2014. The majority of cases reported in this outbreak were diagnosed in the infectious stages of syphilis, primary and secondary syphilis (**Figure 46**).

Figure 46: Multi-State Outbreak of Syphilis, Cases by Stage, 2013 – 2014



Traditionally, syphilis is more often seen in MSM. However, in this outbreak, more than 50 percent of cases were reported in females and none of the male cases reported having sex with males. Having sex with multiple partners and while high or intoxicated were frequently reported risk factors in this outbreak investigation. Due to the increased number of syphilis cases seen among women and two congenital syphilis cases (both reported in South Dakota) occurring during this outbreak, the NDDoH reminded healthcare providers to screen high risk patients three times during pregnancy. Screening should occur at the first prenatal visit, during the third trimester (ideally at 28-32 weeks gestation) and at delivery.

Viral Hepatitis

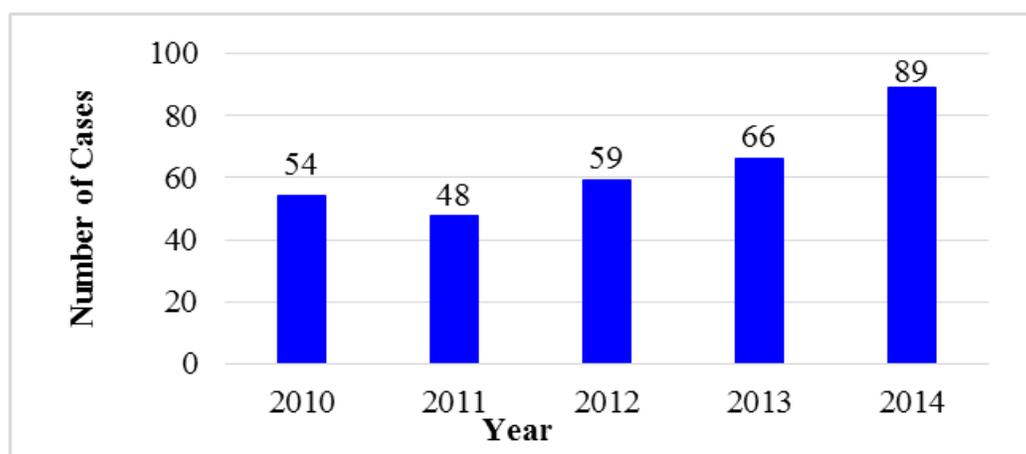
Sarah Weninger, Hepatitis Coordinator

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, developing and implementing a statewide media campaign to increase awareness about viral hepatitis, and contracting with local public health units (LPHUs) to provide the above mentioned viral hepatitis services. In 2014, NDDoH contracted with 11 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 2014, the number of individuals tested at sites almost doubled from 2013. Testing sites screened 1,293 of individuals and 88 (7%) were positive in 2014 compared 686 individuals being screened and 57 (8.3%) positive in 2013.

Hepatitis B Virus

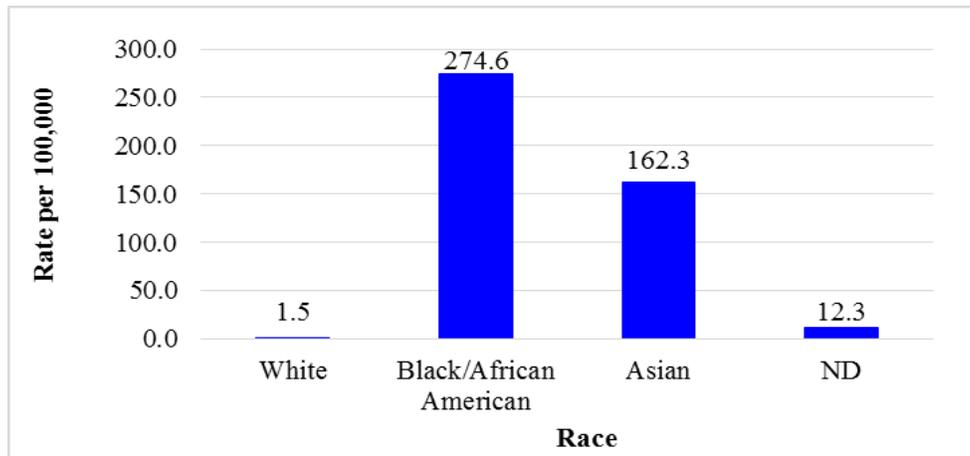
In 2014, 89 cases of chronic HBV infection were reported from 13 counties in North Dakota. This represents a 35 percent increase from the 66 cases reported in 2013 (**Figure 47**). There have been no acute hepatitis B cases reported in North Dakota in the past five years.

Figure 47: Reported Chronic HBV Cases by Year, North Dakota, 2010-2014



Of the 89 HBV-positive cases reported to the NDDoH, 52 percent were female. About 50 percent of reported cases occurred among people between the ages of 30 and 49, and the median age was 38 (range: 2 to 87 years). Hepatitis B rates are highest among minority populations in North Dakota (**Figure 48**). Race information was reported for only 69 percent of cases. Among those reporting race, 59 percent were Black/African American, 23 percent were Asian and 11 percent were white. Of the cases where information is available, 88 percent are refugees or individuals born in countries outside the United States that have intermediate or high rates of endemic hepatitis B infection.

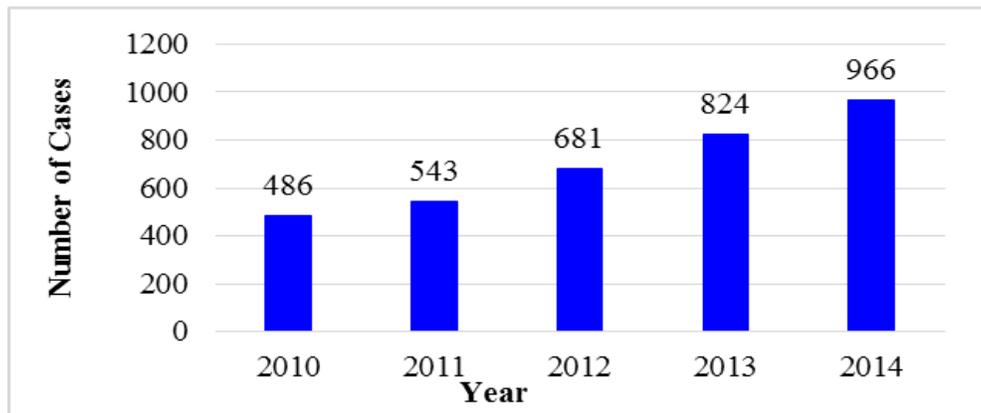
Figure 48: Hepatitis B Rates by Race, North Dakota, 2010-2014



Hepatitis C Virus

In 2014, the NDDoH received 966 reports of newly identified cases as having a positive laboratory result that indicates past or present HCV infection, a 17 percent increase from the 824 cases reported in 2013 (Figure 49). No acute infections were reported in 2014. Numbers do not distinguish between resolved versus current infections.

Figure 49: Reported HCV Cases by Year, North Dakota, 2010-2014



Hepatitis C infections in North Dakota are predominantly being diagnosed in young individuals. About 50 percent of cases reported in 2014 were among individuals less than 36 years of age. Nationally, acute hepatitis C outbreaks are being reported across the country in persons less than 30 years. These outbreaks of acute hepatitis C are primarily being seen in persons who inject drugs or share injection drug equipment.

Hepatitis C Outbreak Investigation

In 2014, the NDDoH continued the investigation of hepatitis C cases in Ward County. By Dec. 31, 2014, there were 51 cases in the outbreak. More than 700 individuals were tested for hepatitis C in 2014. There was no indication of ongoing transmission of hepatitis C in 2014 related to the outbreak strain. Also, the NDDoH provided education to healthcare facilities on proper infection control and preventing bloodborne pathogen transmission in 2014.

Summary of Selected Reportable Conditions North Dakota

Reportable Conditions	January - December 2013	January - December 2014
Campylobacteriosis	127	120
Chickenpox	36	21
Chlamydia	2946	3418
Cryptosporidiosis	85	146
E, Coli, shiga toxin positive (non O157)	30	27
E, coli O157:H7	14	12
Enterococcus, Vancomycin-resistant (VRE)	463	146
Giardiasis	44	39
Gonorrhea	493	697
Haemophilus influenza (invasive)	13	8
Acute Hepatitis A	9	8
Acute Hepatitis B	0	0
Acute Hepatitis C	3	0
HIV/AIDS	58	76
Influenza	4015	4758
Legionellosis	3	4
Listeria	0	1
Lyme Disease	29	14
Malaria	4	8
Meningococcal disease**	3	2
Mumps	1	1
Pertussis	87	51
Q fever	0	2
Rabies (animal)	40	18
Rocky Mountain spotted fever	2	3
Salmonellosis	102	87
Shigellosis	18	21
Staphylococcus aureus, Methicillin-resistant (MRSA)	114	162
Streptococcal pneumoniae*** (invasive, children <5)	0	0
Syphilis, Primary and Secondary	13	14
Trichinosis	0	0
Tuberculosis	12	15
Tularemia	0	4
Typhoid fever	0	2
West Nile Virus Infection	127	23

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