



In This Issue:  
2013 Year In Review

- ◆ Selected Vaccine-Preventable Disease Surveillance.....1
- ◆ Rabies..... 1-2
- ◆ Foodborne Gastroenteritis Outbreaks.....2
- ◆ Significant Disease Control Investigations.....3-5
- ◆ Summary of Selected Reportable Conditions.....6

# Epidemiology report

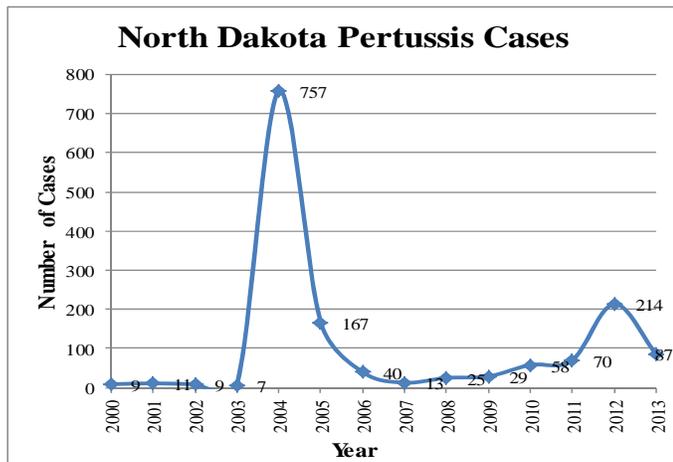
## Vaccine-Preventable Disease Surveillance

by Amy Schwartz, Surveillance Epidemiologist

### Pertussis

Preliminary data indicates that 87 cases of pertussis were reported from 18 North Dakota counties in 2013. Five of the cases were hospitalized. In comparison, 214 cases of pertussis were reported in 2012, 70 cases in 2011, 58 cases in 2010 and 29 cases in 2009.

**Chart 1. North Dakota Pertussis Cases 2000-2013.**



### Mumps

In 2013, one probable and two suspected cases of mumps were reported. The cases were from different counties and were not linked. Two cases of suspect mumps were reported in 2012. Seven cases of mumps were reported in 2011, four confirmed and three suspect. There were no deaths reported.

### Meningococcal Disease

In 2013, three confirmed cases (2 serogroup B, 1 serogroup Z) of meningococcal disease were reported in North Dakota, compared to one confirmed case (serogroup B) in 2012 and two confirmed cases (serogroup Y) in 2011. No deaths were reported.

### Chickenpox

Preliminary data indicates that 20 confirmed and 16 probable cases of chickenpox were reported in 2013 compared with the 18 confirmed and 21 probable cases reported in 2012.

No cases of measles, diphtheria or tetanus were reported in 2013.

### Rabies

by Alicia Lepp, Surveillance Epidemiologist

Preliminary numbers for 2013 indicate that a total of 607 animals were tested for rabies in North Dakota, with 40 (6 %) testing positive. Forty-nine of the 53 North Dakota counties submitted at least one animal for rabies testing. Twenty-one counties had an animal that tested positive. Burleigh, Cass and Ward submitted the highest number of animals (n=102, n=86 and n=51, respectively). Burleigh (n=8) and Morton (n=4) counties had the highest number of animals that tested positive, and Sargent had the highest proportion of submitted animals that tested positive (33 %), followed by Wells (23 %).

Cats were the most commonly submitted species (n=191, 31% of all submissions). The highest rates of positive tests were in porcine (100%), followed by skunks (47%) (Table 1).

**Table 1. Positive Rabies Cases by Animal, North Dakota, 2013. \***

Species	Number Positive	Percent Positivity
Bat	3	7%
Bovine	8	12%
Cat	5	3%
Equine	1	7%
Porcine	2	100%
Skunk	21	40%
<b>Grand Total</b>	<b>40</b>	<b>6%</b>

In addition to passive rabies surveillance, (testing of animals that have exposed a person or domestic animal), the North Dakota Department of Health (NDDoH), North Dakota Game and Fish and USDA Wildlife Services conducted active surveillance in which coyotes, skunks, raccoons, badgers, foxes or other carnivores were collected through surveillance activities, hunter-harvested animals or road kill. The surveillance area included the entire state of North Dakota. In 2013, 66 of the 607 (10%) of the animals that were submitted for rabies testing were part of this active surveillance. Five (7%) of the animals tested positive for rabies.

The NDDoH reports only laboratory-confirmed cases of rabies. Cases of rabies may occur and be unobserved and therefore untested, particularly in wild populations. Rabies testing can be done at either the North Dakota Department of Health’s Division of Laboratory Services in Bismarck or the North Dakota State University Veterinary Diagnostic Laboratory in Fargo. Consultation on possible exposures to rabies is available from the NDDoH by calling 701.328.2378 or 800.472.2180.

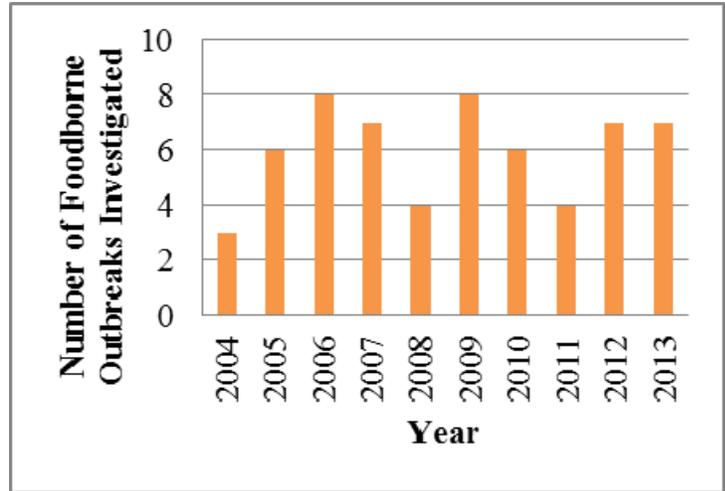
### 2012–2013 Acute Viral Gastroenteritis Outbreak Summary

by Alicia Lepp, Surveillance Epidemiologist

In 2013, the North Dakota Department of Health (NDDoH) investigated a total of seven outbreaks of gastroenteritis involving at least 96 cases of illness. The seven outbreaks were classified as follows: two confirmed foodborne and five probable foodborne.

During the past ten years, the median number of outbreaks investigated by the NDDoH per year was 6.5 (range, 3 to 8) (Chart 2).

**Chart 2. Foodborne Outbreaks Investigated, North Dakota, 2004-2013.**



A specific pathogen was laboratory confirmed in 28 percent of the outbreaks investigated (norovirus was implicated in one foodborne outbreak associated with cross contamination by an ill food worker and also in a foodborne outbreak associated with attending a wedding). The etiologic agent was undetermined in five (71%) of the outbreaks. Laboratory testing was conducted in three of the seven outbreaks (42%). Reasons for no laboratory testing include lack of appropriate specimens (n=4). A food vehicle was not determined for any of the outbreaks.

Foodborne outbreaks are caused by a variety of enteric bacterial, viral, parasitic and chemical agents. A foodborne outbreak is an incident in which two or more people experience a similar illness after ingesting a common food and epidemiologic analysis implicates the food as the source of illness or an unexplained, unexpected increase of similar illness and food is a likely source. Collecting stool specimens and timely reporting to public health authorities is important in identifying the etiology and preventing further spread of illness. To report gastroenteritis outbreaks, call the NDDoH at 701.328.2378 or 800.742.2180.

North Dakota Department of Health

Foodborne & Gastrointestinal Illness website

[www.ndhealth.gov/disease/GI](http://www.ndhealth.gov/disease/GI)

## Significant Disease Control Investigations

by Alicia Lepp, Dee Pritschet, Sarah Weninger, Lindsey VanderBusch and Tracy Miller

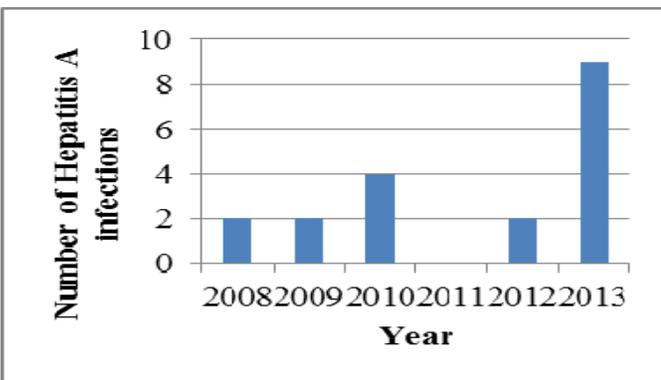
### **Rabid Pigs Identified in North Dakota**

In June 2013, the North Dakota Department of Health was notified of a pig that tested positive for rabies. North Dakota has not had a positive report of rabies in swine since 1992. The pig was one of 21 feeder pigs that were placed on a rural premise and housed in an outdoor pen. The day before the positive pig died, two other pigs had been showing signs of illness and died. Three days later, a fourth pig became ill, was euthanized and tested positive for rabies. The remaining 17 pigs were placed on an eight month quarantine. No other pigs became ill during this time. Human exposure investigations led to the recommendation of four of the six people who had contact with the pigs to receive rabies post-exposure vaccination. One pet dog that was current on its rabies vaccinations received a booster. Samples from the two pigs that tested positive for rabies were sent to the centers for Disease Control and Prevention (CDC) for rabies antigenic typing. Both specimens were identified as variants found in skunks in the North Central United States. Although this information indicates a skunk exposure, the mechanism of how these pigs were exposed to rabies remains unknown.

### **Hepatitis A**

The North Dakota Department of Health (NDDoH) investigated nine confirmed cases of Hepatitis A in 2013. This is a significant increase in cases compared to the past five years, where the average of confirmed cases was two.

**Chart 3. North Dakota Hepatitis A infections 2008-2013.**



In October of 2013, NDDoH was notified of an individual that may have exposed people who attended five different churches in the state. NDDoH issued a news release to inform people who had attended the churches and received communion on certain dates to consult their healthcare provider if they develop symptoms. The risk of hepatitis A from receiving communion is low and no additional confirmed hepatitis A cases were reported relating to this exposure. The hepatitis A case most likely contacted the virus at an event that was attended outside of the country. The suspect vehicle for the infection was mixed berries.

Mixed berries were also the implicated food item in a multi-state outbreak of hepatitis A in 2013. One hundred sixty-two cases in ten states had a confirmed hepatitis A infection and reported eating Townsend Farms Organic Antioxidant Blend. Seventy-one persons were hospitalized and no deaths were reported. No North Dakota residents reported this exposure. The most likely vehicle of the infections appeared to be a common shipment of pomegranate seeds from Goknur Foodstuffs Import Export Trading in Turkey that were used in the product. The hepatitis A infections had the same genotype identified in a 2013 outbreak in Europe linked to frozen berries and a 2012 outbreak in British Columbia, Canada linked to frozen berry blend with pomegranate seeds. These hepatitis A infections resulted in an atypical foodborne outbreak. This is due to the long incubation time between infection and illness for hepatitis A (two to seven weeks), the potential for continued common source because the product was a frozen product and unlike bacterial foodborne outbreaks, there is no method for isolating hepatitis A from food.

### **Positive Case of Bovine Tuberculosis**

A case of *Mycobacterium bovis* infection has been identified in North Dakota (*M. bovis*). *M. bovis* is a bacteria similar to *Mycobacterium tuberculosis* and can cause disease in people. *M. bovis* is most commonly found in cattle and other animals such as bison, elk and deer. In people, *M. bovis* causes tuberculosis (TB) disease that can affect the lungs, lymph nodes, and other parts of the body.

The confirmed case experienced symptoms of cough, fever and weight loss; had an abnormal chest x-ray; and a CT scan showed cavitation with infiltrates. These are all symptoms commonly found with tuberculosis. Sputum samples were collected for culture and testing confirmed the presence of *M. bovis*.

Sensitivity patterns not only identified a resistance to pyrazinamide which is common for *M. bovis*, but also a low-level resistance to isoniazid. This drug resistance required the addition of a second-line TB medication and treatment was extended to nine months rather than a typical six month course of medication.

In humans, *M. bovis* causes a relatively small proportion (less than 2%) of the total number of cases of TB disease in the United States. This accounts for less than 230 TB cases per year in the United States. *M. bovis* transmission from cattle to people was once common in the United States. This has been greatly reduced by decades of disease control in cattle and by routine pasteurization of cow’s milk.

People are most commonly infected with *M. bovis* by eating or drinking contaminated, unpasteurized dairy products. Infection can also occur from direct contact with a wound, such as what might occur during slaughter or hunting. Additionally, humans can become infected by breathing in the exhaled air of *M. bovis*-infected animals. Direct transmission from animals to humans through the air is thought to be rare, but *M. bovis* can be spread directly from person to person when people with the disease in their lungs cough or sneeze.

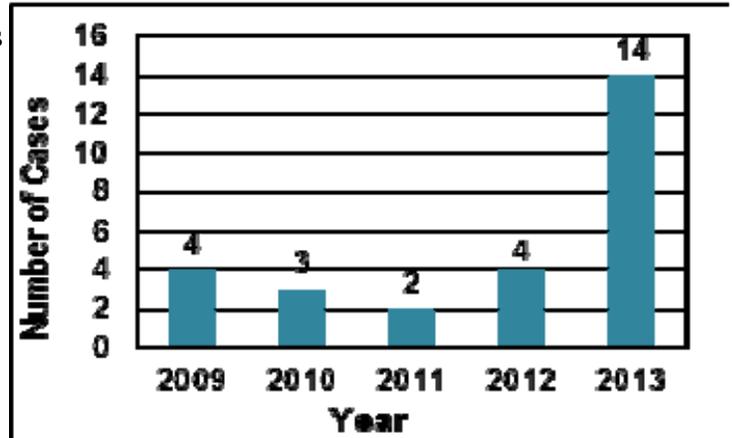
**North Dakota Early Syphilis Cases Increase in 2013**

The number of cases of syphilis being reported in North Dakota has increased since 2011. In 2011 and 2012, two and four cases of early syphilis (primary, secondary & early latent) were reported to the NDDoH, respectively. In 2013, 14 cases of early syphilis were reported.

In 2013, 50 percent of early syphilis cases were located in Sioux County. Of all the cases reported in 2013, 57 percent were American Indian, 22 percent were white, 14 percent were black and 7 percent were Asian. Eleven (79 percent) of the cases were male.

In the U.S., 75 percent of all primary and secondary cases occur in men who have sex with men. In N.D., the majority (57 percent) of cases were reported in heterosexual individuals. Five of the 11 males reported in 2013 were men who have sex with men.

**Chart 4. North Dakota Early Syphilis Cases by Year, 2009-2013.**



**HIV Elite Controller**

North Dakota has identified its first known HIV Elite Controller. Elite Controllers are HIV-positive people whose immune systems for long periods of time have been able to keep the virus at undetectable levels without using antiretroviral drugs. Scientists generally define them as people who maintain no more than 50 copies of HIV per milliliter (mL) of blood over a period of at least 1 to 2 years despite never having taken antiviral medications. Researchers believe it is unlikely that elite controllers can transmit the virus.

Elite Controllers have a rare set of genes that allow their immune systems to unleash killer T cells. HIV has the ability to mutate and is one reason the normal immune system can't control the virus. The killer T cells in elite controllers don't need help. They knock off virus-infected cells all by themselves and are able to kill off mutant HIV variants as they arise.

Of the more than 34,000,000 people diagnosed worldwide who are HIV-positive, there are just a few thousand known elite controllers. The existence of Elite Controllers has been known for more than a decade; studies continue to try to identify what occurs in their immune systems to suppress the HIV virus from replicating and developing HIV disease with hopes of leading to the creation of new technologies to produce the same results in others.

**Hepatitis C outbreak Among Skilled Nursing Facility Residents**

In March 2013, the North Dakota Department of Health was notified of three HCV cases among residents in a skilled care facility (Facility A). We initiated an investigation to identify additional cases and the exposure source to prevent further transmission. A confirmed case was HCV infection in any resident of Facility A during January 2011–September 2013, matching the outbreak strain by quasispecies analysis. Additional case-finding occurred through serologic screening. We abstracted patient charts and performed a case-control study to identify risk factors associated with infection.

By December 10, 2013, a total of 44 confirmed cases (acute and chronic) had been identified. Preliminary results from a case control study show HCV transmission was associated with receipt of podiatry, foot care and phlebotomy at Facility A. Infection control breaches sufficient to account for the outbreak were not identified. Recommendations for strict adherence to standard precautions and consultation with a certified infection preventionist have been provided to the facility administration. Surveillance in Facility A continues in an effort to ensure acute cases do not continue to occur.

**Haemophilus influenzae Type B Case in North Dakota**

The North Dakota Department of Health (NDDoH) confirmed a case of invasive *Haemophilus influenzae*, type b (Hib) disease in an unvaccinated child in 2013. This is only the second case of HIB disease in a pediatric patient reported in North Dakota since 1991. The last case was reported in 2011. Prior to the availability of Hib vaccine, Hib was one of the most common causes of meningitis and invasive infections in young children. Nationally, the United States only saw 18 cases of invasive HIB disease in children under five in 2013 and 30 cases in 2012.

The case fatality rate of invasive HIB disease in children is between 3 and 6 percent. Up to 20 percent of surviving patients experience long term sequelae, such as hearing loss or neurological damage. Symptoms of Hib depend upon the part of the body affected. Fever is present in all forms of Hib disease. Meningitis can cause stiff neck, headache and vomiting. Pneumonia may cause a cough that produces mucus and rapid breathing, and patients with

epiglottitis usually have noisy breathing and a very sore throat. Swelling and purple-red discoloration of the skin is a symptom of cellulitis.

North Dakota providers should take steps to prevent Hib disease by vaccinating children according to the recommended immunization schedule. According to the 2012 National Immunization Survey (NIS) only 82.1 percent of North Dakota children ages 19 to 35 months were fully vaccinated against HIB. Hib conjugate vaccine should be given to all children between 2 months and 5 years of age. Depending on the type of vaccine, children should receive three doses at 2, 4 and 6 months of age or two doses at 2 and 4 months of age. A booster dose should be given at 12 to 15 months of age, regardless of what type of Hib vaccine they previously received. Some older children and adults who are at high risk for complications also are recommended to receive this vaccine. Hib disease is still a threat and this case underlines the importance of vaccination. Vaccination not only protects the individual being vaccinated, but also those who cannot be vaccinated or are too young to receive the vaccine.

**Division of Disease Control**  
**Upcoming 2014 Conferences**

**\*2014 ND State  
Immunization Conference\***

**July 15-16, 2014**

**Bismarck Ramkota Hotel**

**Registration is available at:**

<http://und.edu/academics/extended-learning/conference-services/immunization/index.cfm>

**\*2014 HIV/STD/TB/Viral  
Hepatitis Symposium\***

**September 17-18, 2014**

**Bismarck Radisson Hotel**

**Registration information will be available soon at**

[www.ndhealth.gov/HIV/events.htm](http://www.ndhealth.gov/HIV/events.htm)

<b>Summary of Selected Reportable Conditions</b>					
<b>North Dakota, 2012-2013</b>					
<b>Reportable Condition</b>	<b>Oct.- Dec.</b>	<b>Jan.- Dec.</b>		<b>Oct.- Dec.</b>	<b>Jan.- Dec.</b>
Campylobacteriosis	18	126		14	90
Chickenpox	12	36		14	39
Chlamydia	749	2940		721	2908
Cryptosporidiosis	24	84		4	35
E. coli, shiga toxin positive (non-O157)	3	31		2	19
E. coli O157:H7	2	9		4	13
Enterococcus, Vancomycin-resistant (VRE)	65	273		89	455
Giardiasis	9	43		15	64
Gonorrhea	129	491		114	340
Haemophilus influenzae (invasive)	6	13		3	15
Acute Hepatitis A	3	9		0	2
Acute Hepatitis B	0	0		0	0
Acute Hepatitis C	1	5		0	0
HIV/AIDS <sup>1</sup>	17	58		11	44
Influenza	812	4124		1635	3119
Legionellosis	1	3		1	3
Listeria	0	0		0	0
Lyme Disease	2	28		2	16
Malaria	1	4		1	2
Meningococcal disease <sup>2</sup>	0	3		0	1
Mumps	0	1		0	0
Pertussis	20	87		41	214
Q fever	0	0		0	0
Rabies (animal)	6	40		10	75
Rocky Mountain spotted fever	0	2		0	1
Salmonellosis	14	102		16	67
Shigellosis	5	18		2	8
Staphylococcus aureus, Methicillin-resistant (MRSA)	24	96		28	112
Streptococcal pneumoniae <sup>3</sup> , (invasive, children < 5 years of age)	1	4		0	1
Syphilis, Primary and Secondary	5	14		1	4
Trichinosis	0	0		0	0
Tuberculosis	1	12		14	26
Tularemia	0	0		0	3
Typhoid fever	0	0		1	1
West Nile Virus Infection	1	89		2	127

\*Provisional data

<sup>1</sup> Includes newly diagnosed cases and cases diagnosed previously in other states that moved to North Dakota.

<sup>2</sup> Includes confirmed, probable and suspect meningococcal meningitis cases.

<sup>3</sup> Includes invasive infections caused by streptococcal disease not including those classified as meningitis.