Epidemiology Report

NORTH DAKOTA DEPARTMENT of HEALTH

Oct – Nov – Dec 2010

In this Issue:

- 2010 Year In Review
- Reportable Conditions Summary

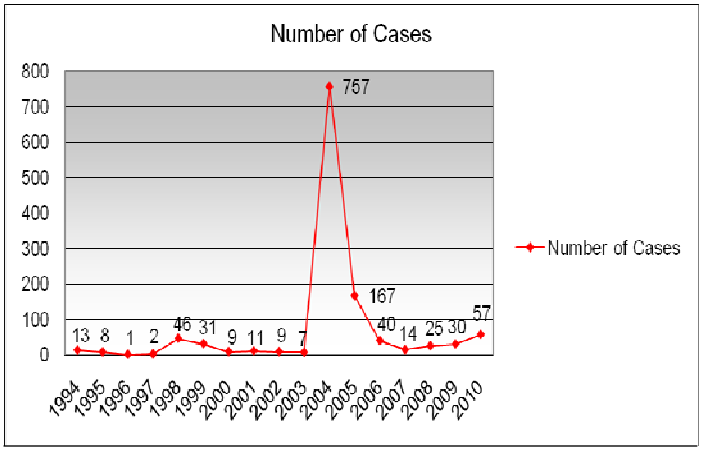
2010 Year in Review

Selected Vaccine-Preventable Disease Surveillance 2010

Pertussis

Preliminary data indicates that 57 cases of pertussis were reported from 10 North Dakota counties in 2010. Two of the cases were hospitalized. In comparison, 30 cases of pertussis were reported in 2009, 25 cases in 2008 and 14 cases in 2007 **(Figure 1)**.

Figure 1. Pertussis Cases by Year, North Dakota, 1994-2010.*



*Preliminary data. Data may change pending investigation.

Mumps

In 2010, three suspect cases of mumps were reported in three North Dakota counties; two cases of mumps were reported in both 2009 and 2008. The cases were not epidemiologically linked.

Chickenpox

Preliminary data for 2010 indicates 51 cases of chickenpox were reported in North Dakota, compared to 86 reported in 2009 and 106 in 2008. Although health-care providers, schools, day cares and local public health units are mandated to report all cases of chickenpox to the North Dakota Department of Health (NDDoH), chickenpox continues to be under-reported in North Dakota.

Neisseria meningitidis

In 2010, two cases of meningococcal disease were reported and laboratory confirmed in North Dakota, compared to two cases in 2009 and six cases reported in 2008. Of cases reported in 2010, both were serogroup Y.

Rabies

Preliminary numbers for 2010 indicate that 443 animals were tested for rabies in North Dakota, with 21 (4.7 percent) testing positive. This is a slight increase in both testing and positive animals from 2009 (**Table 1)**. The skunk rabies virus is the major variant seen in North Dakota. Although the number of animals that tested positive for rabies in North Dakota in 2010 is one of the lowest it has been in the past 10 years, this does not necessarily indicate a decrease in incidence of animal rabies (**Figure 2**). The NDDoH reports only laboratory-confirmed cases of rabies. Many cases of rabies may occur and be unobserved and therefore untested, particularly in wild animal populations.

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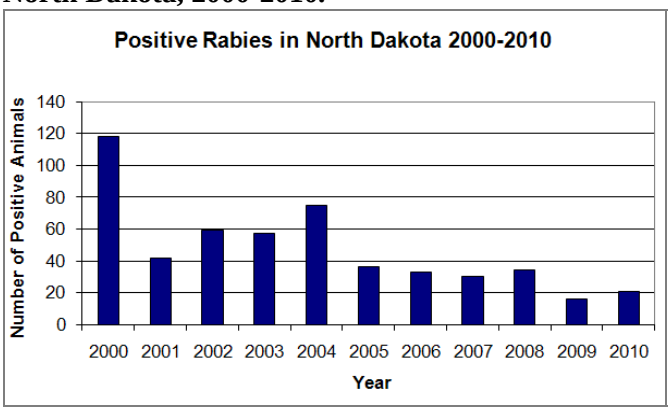
EQUAL OPPORTUNITY EMPLOYER.

Table 1. Positive Rabies Cases by Animal, North Dakota, 2009-2010.

Animal Type	Number Positive	
	2010†	2009
Badger	1	0
Bat	2	1
Cat	4	1
Cow	2	1
Dog	2	1
Skunk	10	12
Total	21	16

†Provisional data

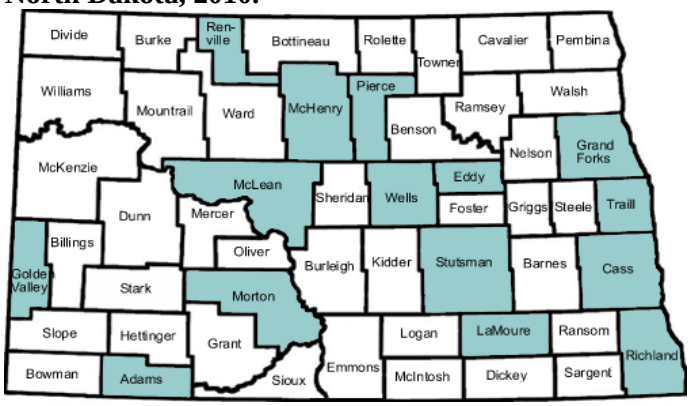
Figure 2. Positive Animals Rabies Cases by Year, North Dakota, 2000-2010.



Regardless of human exposure, rabies testing can be done at either the NDDoH Division of Laboratory Services in Bismarck or the North Dakota State University Veterinary Diagnostic Laboratory in Fargo. An exposure is defined as a bite that breaks the skin or saliva that comes into contact with an open cut, sore or wound, or to a mucous membrane such as the mouth, nose or eyes. Call the NDDoH at 701.328.2378 or 800.472.2180 for consultation about rabies exposure.

Animals tested positive for rabies from 15 counties (**Figure 3**). Animals were submitted for rabies testing from all counties except Billings, Divide, Sioux and Slope.

Figure 3. Positive Animal Rabies Cases by County, North Dakota, 2010.

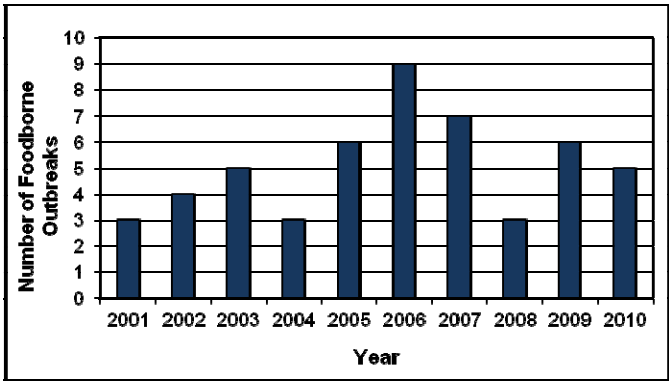


Foodborne Gastroenteritis Outbreaks

In 2010, the NDDoH investigated five foodborne gastroenteritis outbreaks. Four outbreaks were laboratory-confirmed as norovirus and one outbreak was unknown etiology (**Table 2** found on page 5**)**.

Over the past 10 years, the number of foodborne gastroenteritis outbreaks investigated by the NDDoH each year ranges from three to nine (10-year mean = five) **(Figure 4)**. More than 50 percent of laboratory-confirmed outbreaks in North Dakota are caused by norovirus, most often associated with cross contamination by sick food handlers.

Figure 4. Number of Foodborne Gastroenteritis Outbreaks, North Dakota, 2001-2010.



Collecting stool specimens and timely reporting to public health authorities are important in identifying the etiology and preventing further spread of illness. To report gastroenteritis outbreaks, call the NDDoH at 701.328.2378 or toll free at 800.472.2180.

Significant Disease Control Investigations

***Klebsiella pneumoniae* Carbapenemase (KPC) – Producing Organisms Identified in North Dakota**

Three cases of *Klebsiella pneumoniae* Carbapenemase (KPC) –producing organisms were identified in North Dakota in February 2010. Two of the three cases were Minnesota residents who were cared for in North Dakota medical facilities while the third was a North Dakota resident. Strict infection control measures and active surveillance cultures were recommended to these facilities in order to control the spread and gain a better understanding of how widespread this organism was. Since last winter, an additional five cases of KPC-producing organisms have been reported to the North Dakota Department of Health from throughout the state. Not all of these cases are N.D. residents; however, of those with completed investigations, all cases had some exposure to health-care facilities.

KPC organisms, also known as Carbapenem-Resistant or Carbapenemase-Producing *Enterobacteriaceae* (CRE) produce an enzyme that causes resistance to the carbapenem class of antibiotics as well as other beta-lactam agents including penicillins, cephalosporins and aztreonam. While first identified in *Klebsiella pneumonia*, other organisms of the *Enterobacteriaceae* family, such as *Enterobacter* spp. and *E. coli*, have been found to produce this enzyme. Patients at high risk for morbidity and mortality related to these organisms include those with prolonged hospitalization, those who are critically ill, and those exposed to invasive devices (e.g. ventilators or central venous catheters). Healthy people usually do not get infections caused by KPC/CRE infections.

KPC/CRE may cause infections including pneumonia, bloodstream infections, wound or surgical site infections, and meningitis in health-care settings. These infections are a threat to patients because the patient will have fewer treatment options. Additional information can be found on the Centers for Disease Control and Prevention (CDC) website at www.cdc.gov/HAI/organisms/klebsiella/klebsiella.html.

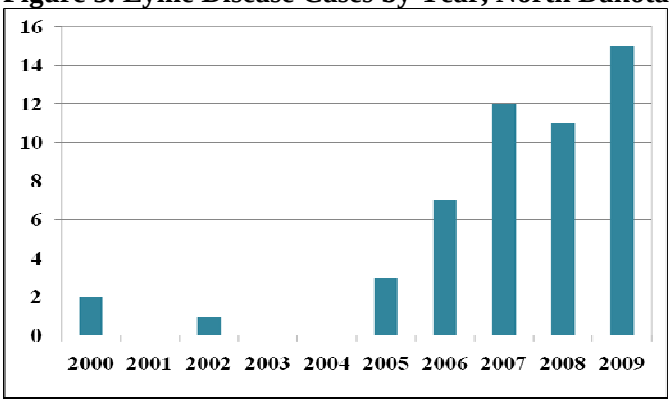
As of Jan. 1, 2011, organisms with reduced susceptibility to carbapenem, i.e. *Klebsiella pneumonia* carbapenemase (KPC) and carbapenem-resistant *Enterobacteriaceae* (CRE), have become reportable to the NDDoH. Investigations will be completed on reported cases in order to identify any additional cases and risk factors as well as work with facilities to implement prevention strategies to prevent spread to other patients.

Disease Control: Ticked off this summer

The NDDoH collects data on several tick-borne infectious diseases such as tularemia, Rocky Mountain spotted fever (RMSF) and Lyme disease. None of these diseases are abundant in N.D.; typically one to five cases are reported each year. However, in recent years, non-travel related Lyme disease cases have been reported to the NDDoH as well as an overall increase in the number of reported cases (**Figure 5)**.

In the past, N.D. residents were not considered to be at risk for Lyme disease unless they traveled outside of the state, since the vector, *Ixodes scapularis* (also known as the deer tick), was not previously found in N.D. In addition, N.D. borders Minnesota, a highly endemic state for Lyme disease, which has documented a northwesterly expansion of the *Ixodes* population as well as Manitoba, which has reported the presence of *Ixodes* sp. Tick surveillance in N.D. has not been conducted for more than two decades.

Figure 5. Lyme Disease Cases by Year, North Dakota



In the summer of 2010, the NDDoH collaborated with North Dakota State University, the North Dakota Game and Fish Department and the University of North Dakota to conduct tick surveillance throughout the state to determine whether the deer tick is in N.D. Ticks were collected at sites throughout the state, with an emphasis on the eastern side of the state where the habitat is more likely to support a deer tick population. The ticks were collected through a process called dragging that involves pulling a white piece of cloth across the ground in areas where ticks are thought to live. Any ticks that clung to the white cloth were then collected and taken back to the NDSU and UND laboratories, where they were counted and examined to determine species. In addition to dragging, some ticks were collected from trapped small mammals.

Figure 6. EIS Officer Dr. Jennifer Cope dragging for ticks in Morton County.

Ticks were then identified by species and life stage. All adult and nymph *Ixodes scapularis* ticks were tested for *Borrelia burgdorferi*, the bacteria that causes Lyme disease, using PCR. *Ixodes scapularis* ticks (n=85) were identified in six counties (Eddy, Grand Forks, Pembina, Ramsey, Rolette and Steele Counties). All *Ixodes scapularis* tick life stages were present in each of these counties. One adult female tick from Grand Forks County tested positive for *B. burgdorferi*.

The data collected through this summer's efforts will help the NDDoH determine the risk of Lyme disease and other tick-borne diseases in the state. In the meantime, simple prevention measures such as wearing long pants and sleeves and applying insect repellant containing DEET when entering tick-infested areas will reduce the risk of having a tick attach to the skin.

For more information, visit the new tick-borne disease website at www.ndhealth.gov/disease/tickborne or call the NDDoH at 800.472.2180 or 701.328.2378.

Rabid Dog at a North Dakota Animal Shelter

On March 9, 2010, two dogs were brought to an animal shelter in Grand Forks, North Dakota. The dogs had been picked up as strays in Marshall County Minnesota. Upon arrival, the dogs were quarantined and observed for signs of disease or abnormal behavior through March 14. Both dogs were available for public viewing at the shelter on March 15.

The larger of the two dogs, Dog B, was unsuitable for adoption and euthanized on March 19. Dog B did not exhibit signs of illness or behavioral changes that would indicate rabies infection at the time he was euthanized and therefore he was not tested for rabies. On March 20, the smaller dog, Dog A, was placed with a foster family. The foster family reported that on March 25, Dog A started acting sick. The dog was brought back to the shelter and seen by a local veterinarian on March 27 who noted neurological signs. Therefore, it was euthanized and sent for rabies testing.

On March 31, the NDDoH was notified that Dog A tested positive for rabies. Due to the close relationship of the two dogs, the possibility existed that Dogs A and B were exposed to rabies at the same time. Therefore, rabies viral shedding in Dog B could not be ruled out, so Dog B was considered rabid as well. Shelter employees and volunteers were contacted and assessed for exposure to either of the two dogs at the animal shelter. A news release was issued to notify the public who may have been exposed to the two dogs at the shelter to contact the NDDoH or the Grand Forks Public Health Department for consultation. Those with possible exposures were referred to a health-care provider for evaluation and to determine if they needed to initiate rabies post-exposure prophylaxis.

The full report describing this investigation and public health response was published in the Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report and is available at www.cdc.gov/mmwr/PDF/wk/mm5951.pdf .

Tuberculosis in North Dakota 2010

North Dakota had 12 cases of active Tuberculosis (TB) in 2010, corresponding with an incidence rate of 1.8 new cases for every 100,000 people. North Dakota's incidence rate has historically been lower than the national rate. Of the 12 cases, six were pulmonary, four were extra-pulmonary, and two cases were both pulmonary and extra-pulmonary. The bacteria from three of the non-pulmonary TB cases were found in the lymph nodes, while the other was found in the fluid surrounding the peritoneum. Two cases were part of the same cluster. These two individuals were both homeless and known to spend time together. Their similar type of TB was confirmed through genotyping.

Drug resistance is an important issue with TB that can be costly and complicated to overcome. Drug-resistant TB can develop from previous misdiagnosis and failure to complete appropriate treatment. One case of TB in North Dakota did show this problem in 2010. Determined by drug susceptibility testing at the CDC, this specimen had mild resistance to low levels of the first-line drug isoniazid.

One notable case of TB in 2010 was of a practicing physician. A contact investigation was done to find those at highest risk. Patients of the doctor, family members and other close contacts were notified and tested for TB.

Disease Control Updates

Tracy Miller is our new State Epidemiologist. Congrats Tracy! Contact Tracy with questions relating to epidemiological studies, investigations, and disease surveillance, control, prevention and health intervention activities.

We have new field epidemiologists: Jennifer Schmidt in Jamestown and Shawn McBride in Grand Forks. The HIV/AIDS/TB Program also has two new employees: Shannon Jahner and Craig Steffens. Welcome to our new employees!

There have been several updates and changes to the reportable conditions. As of Jan. 1, 2011, changes have been made to Administrative Rule 33-06-01. Updated reportable condition sheets and report cards will be distributed to local public health units and healthcare providers in North Dakota.

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Table 2. Foodborne Gastroenteritis Outbreaks in North Dakota 2006-2010.

Date	County	Facility	Number Ill	Number Exposed	Suspected Food	Suspected Agent	Contributing Factors
1/2006	Ward	Hotel restaurant	48	73	Unknown	Norovirus	Ill food handlers
4/2006	Cass	Golf course restaurant	27	62	Chicken	Norovirus	Possible environmental contamination
4/2006	Morton	Restaurant	10	25	Unknown	Unknown	Unknown
6/2006	Burleigh	Restaurant and catering	36	Unknown	Fresh fruit	Norovirus	Ill food handlers
6/2006	Out-of-state	Hotel restaurant	(4 ND) 25	Unknown	Unknown	Norovirus	Possible ill food handlers
8/2006	Bowman	Construction worksite	11	60	Possible water	Unknown	Suspect contamination of water coolers
9/2006	Burleigh	Private picnic	21	65	Unknown	Unknown	Unknown
10/2006	Ward	Private home	16	20	Unknown	Norovirus	Unknown
10/2006	Nelson	Restaurant	26	100	Unknown	Norovirus	Ill food handlers
1/2007	Multi-state	Private home	3	Unknown	Peanut butter	*Salmonella* Tennessee	Environmental contamination at production plant
3/2007	Grand Forks	Church	Unknown	Unknown	Suspected ground beef	Possible toxin	Temp abuse and improper reheating of ground beef
3/2007	Dickey	Restaurant	16	Unknown	Unknown	Norovirus	Unknown
6/2007	Stutsman	Picnic/Park	7	70	Unknown	*Salmonella* Newport	Unknown
6/2007	Ward	Private home	23	50	Suspected ground beef	STEC O111:nonmotile	Temp abuse and improper reheating of ground beef
9/2007	Cass	School	7	11	Homemade cookies	Norovirus	Cross-contamination at home from ill food handlers
9/2007	Burleigh	Restaurant/ Wedding	29	63	Unknown	Norovirus	Unknown
2/2008	Burleigh	Restaurant/ Wedding	7	9	Unknown	Norovirus	Unknown
4/2008	McLean	Potluck at Hospital	12	55	Unknown	*Campylobacter jejuni*	Unknown
6/2008	McHenry	Fair/Food Vendors/ Restaurant	33	475	Unknown	Unknown	Unknown
6/2009	McLean	Family reunion	55	69	Multiple	*Salmonella* Montevideo	Baby chick pattern
6/2009	McLean	Catered wedding reception	36	250	Multiple	*Salmonella* Montevideo	Baby chick pattern
6/2009	McLean	Catered wedding reception	89	250	Multiple	*Salmonella* Montevideo	Baby chick pattern
8/2009	Morton	Restaurant	8	Unknown	Unknown	Norovirus	Ill food handler
10/2009	Walsh	Catered meal at business	36	Unknown	Unknown	*Clostridium perfringens*	Power failure and temperature abuse
12/2009	Grand Forks	Hotel/ Wedding	24	39	Unknown	Norovirus	Unknown
2/2010	Walsh	School	25	120	Unknown	Norovirus	Unknown
4/2010	Dickey	Restaurant	12	115	Unknown	Norovirus	Unknown
5/2010	Burleigh	Restaurant	7	Unknown	Unknown	Unknown	Unknown
7/2010	Burleigh	Private Home	8	13	Unknown	Norovirus	Unknown
9/2010	Ward	Private Home	8	12	Unknown	Norovirus	Ill food handler

Summary of Selected Reportable Conditions					
North Dakota, 2009-2010					
Reportable Condition	**October-Dec 2010***	**January-Dec 2010***		**October-Dec 2009**	**January-Dec 2009**
Campylobacteriosis	6	95		4	92
Chickenpox	18	52		19	92
Chlamydia	402	2060		681	1958
Cryptosporidiosis	4	32		4	31
E. coli, shiga toxin positive (non-O157)	0	11		0	9
E. coli O157:H7	0	6		2	6
Enterococcus, Vancomycin-resistant (VRE)	92	362		67	328
Giardiasis	6	35		3	32
Gonorrhea	20	136		59	151
Haemophilus influenzae (invasive)	3	14		4	10
Acute Hepatitis A	0	3		0	2
Acute Hepatitis B	0	0		0	0
Acute Hepatitis C	0	0		0	0
HIV/AIDS[1]	6	25		13	39
Influenza	47	51		2843	4924
Legionellosis	1	7		1	2
Listeria	0	1		0	2
Lyme Disease	1	29		3	15
Malaria	1	1		1	1
Meningococcal disease[2]	0	2		1	2
Mumps	2	3		0	2
Pertussis	7	56		3	30
Q fever	0	0		0	0
Rabies (animal)	5	19		5	16
Rocky Mountain spotted fever	0	1		0	0
Salmonellosis	6	54		13	103
Shigellosis	0	0		0	9
Staphylococcus aureus, Methicillin-resisitant (MRSA)	24	77		23	102
Streptococcal pneumoniae[3], (invasive, children < 5 years of age)	1	3		0	5
Syphilis, Primary and Secondary	3	3		1	4
Trichinosis	0	0		0	0
Tuberculosis	3	12		2	5
Tularemia	0	1		0	0
Typhoid fever	0	1		0	0
West Nile Virus Infection	0	9		0	1

*Provisional data

[1] Includes newly diagnosed cases and cases diagnosed previously in other states who moved to North Dakota.

[2] Includes confirmed, probable and suspect meningococcal meningitis cases.

[3] Includes invasive infections caused by streptococcal disease not including those classified as meningitis.