

November – December 2005

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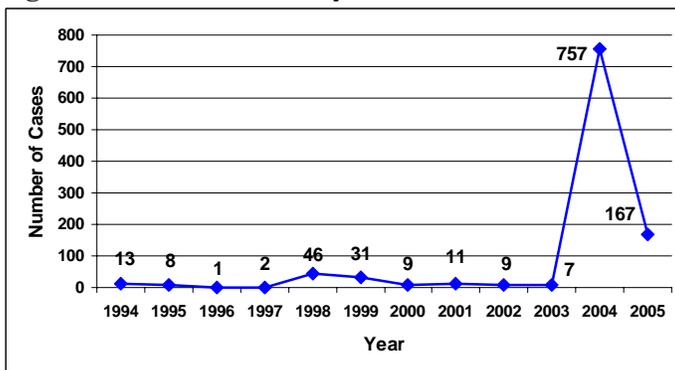
2005 Year in Review

Selected Vaccine-Preventable Disease Surveillance 2005

Pertussis

Preliminary data for 2005 indicates 167 cases of pertussis have been reported from 25 counties in North Dakota. Ten of the cases were hospitalized. The majority of the cases were in the 10 to 19 age group. In 2004, there were 757 cases of pertussis reported, decreasing 78 percent in 2005. Most of the cases in 2004 were attributed to a large outbreak that occurred between June and October. This was the largest outbreak of pertussis investigated in North Dakota in the previous 10 years (five-year median=9). (Figure 1).

Figure 1. Pertussis Cases by Year in North Dakota



In 2005, Tdap (tetanus, diphtheria and acellular pertussis vaccine) became available for adolescents and adults. Previously, there was not a vaccine available to protect adolescents and adults from pertussis. In June, the ACIP (Advisory Committee on Immunization Practices) recommended Tdap, instead of Td, for all adolescents. In October, the ACIP recommended Tdap, instead of Td, for all adults. Currently, the North Dakota Immunization Program makes Tdap available to Vaccines For Children (VFC) eligible children only. Private supplies of Tdap will need to be ordered for children with insurance and all adults. For more information about the new Tdap

Recommendations, visit:

www.cdc.gov/nip/recs/provisional_rec/default.htm.

Mumps

In 2005, four cases of mumps were reported in North Dakota, in comparison to the one case that is normally reported each year. The cases occurred in various regions of the state and were not found to be related. The cases ranged in age from 18 months to 69 years. Two vaccines that protect against mumps virus are currently available. MMR (measles, mumps and rubella vaccine) is recommended at 12 to 15 months of age and 4 to 6 years of age. A new combination vaccine, MMRV (MMR and varicella vaccine) was approved by the Food and Drug Administration in 2005. MMRV should be used when both MMR and varicella vaccine are recommended to be given. MMRV will be available from the North Dakota Immunization Program in the near future.

Chickenpox

Between January and October 2005, 114 cases of chickenpox were reported in North Dakota. The majority of chickenpox cases occurred due to two large school outbreaks. Although health-care providers, schools, daycares 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. In June, the ACIP updated the varicella vaccination recommendations to include administration of a second dose of varicella vaccine in outbreak settings. For more information about the new varicella vaccination recommendations, visit: www.cdc.gov/nip/recs/provisional_rec/default.htm.

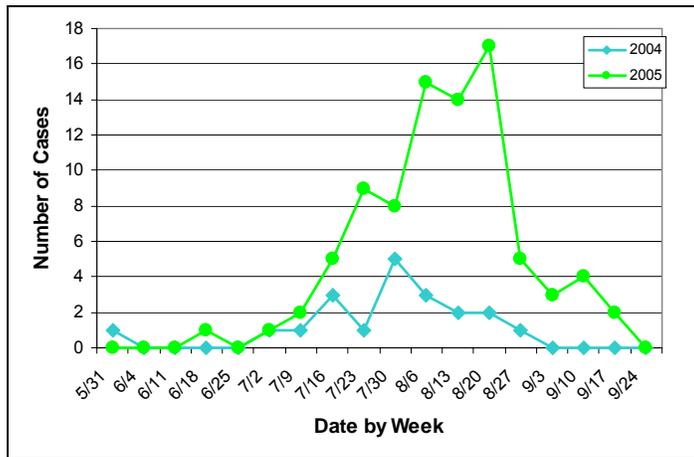
2005 West Nile Virus: Summary

On June 1, 2005, the NDDoH West Nile virus (WNV) surveillance program initiated its fourth season of human arboviral surveillance. In 2005, the Division of Microbiology conducted WNV testing on 1,468 human

samples. Eighty-six positive human cases from 30 counties were reported.

In 2005, follow-up interviews were conducted only with hospitalized patients (30). Of the 86 reported cases, 12 (14 percent) met the case definition of West Nile encephalitis, with the remaining 74 (86 percent) cases classified as West Nile fever. Five asymptomatic blood donors were identified with WNV. No deaths associated with WNV were reported to the health department in 2005. The peak of illness onset occurred during the week ending Aug. 27, 2005. This peak was about three weeks later than in 2004, when the peak illness occurred during the week ending August 6, 2004 (**Figure 2**).

Figure 2. WNV Cases by Date of Onset, North Dakota, 2004 and 2005.

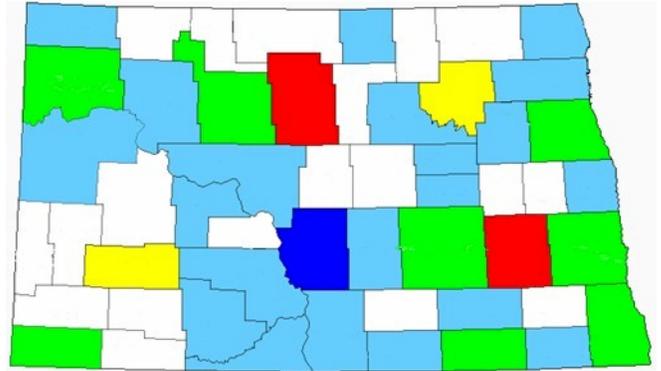


The North Dakota State University Veterinary Diagnostic Laboratory (NDVDL) tested 53 horses for WNV infection. Of the 53 samples submitted, four (7.5 percent) tested positive from three counties (**Figure 3**). In 2005, 29 dead birds were collected and sent to the NDVDL for WNV testing. Of those, 16 tested positive from eight counties. In addition to dead bird testing, 573 sentinel chicken serums were sent to the NDVDL for WNV testing. Twenty-seven chicken serums from seven counties tested positive for WNV (**Figure 3**).

Statewide mosquito monitoring was conducted weekly from June through August using 30 live traps and 100 NJ light traps from around the state. During this time, 243 mosquito pools were tested for WNV with four pools, three from Grand Forks and one from Ward County, testing positive. Positive results were reported from testing conducted by Minot Air Force Base and Grand Forks Public Health/University of North Dakota Biology Department. Female *Culex tarsalis* counts peaked around the end of August.

For additional information about WNV and surveillance, visit the NDDoH website at www.ndwnv.com.

Figure 3. WNV Positive Human, Avian (sentinel and dead bird) and Equine Cases by County, North Dakota, 2005



Legend	
Light Blue	Human only
Yellow	Avian only
Red	Equine only
Green	Human and Avian
Dark Blue	Human and Avian and Equine

Rabies Summary 2005

In 2005, 36 animals tested positive for rabies in North Dakota (**Table 1**).

Table 1. Number of Positive Animal Rabies Tests by Species, North Dakota, 2004-2005.

Animal Type	Number Positive		
	2005 [†]	2004	5-Year Median
Bat	1	2	1
Cat	6	9	5
Cow	2	7	6
Dog	5	3	3
Horse	0	4	1
Raccoon	0	1	0
Skunk	22	49	38
Total	36	75	57

[†]Provisional data

The Division of Microbiology provides free animal rabies testing if human exposure to the animal has occurred. An exposure is defined as a bite that breaks the skin or saliva that comes in contact with an open cut, sore or wound or to a mucous membrane such as the mouth, nose or eyes. If there has been no human exposure, samples for animal rabies testing should be sent to the NDVDL.

Post-exposure prophylaxis may be required for humans who experience an animal exposure. An algorithm to help

determine appropriate actions to follow when an exposure to an animal has occurred can be viewed at www.health.state.nd.us/disease/Rabies/RabiesPublications.htm. A list of sites where rabies immune globulin and vaccine may be available can be found at www.health.state.nd.us/disease/Rabies/Documents/RabiesBiologicals2.pdf.

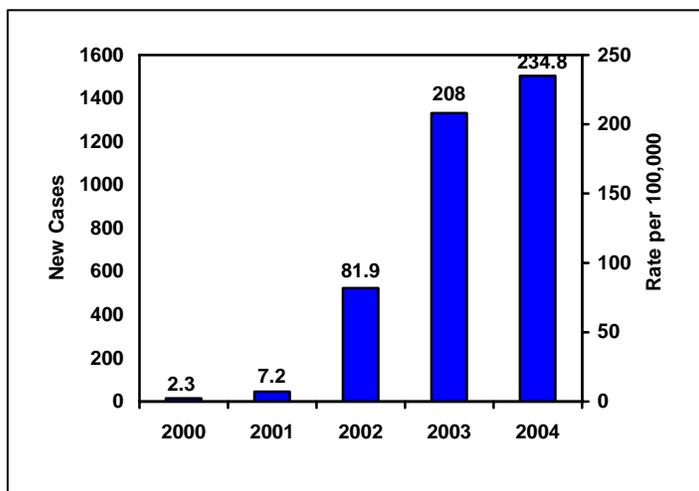
Methicillin Resistant *Staphylococcus aureus* – A Four-Year Review, 2000-2004

Methicillin-resistant *Staphylococcus aureus* (MRSA) is defined as a *Staphylococcus aureus* infection with culture confirmation of oxacillin or methicillin resistance on antibiotic susceptibility testing. Invasive site infections became reportable Feb. 1, 2000, with all infections reportable as of Aug. 1, 2002.

An MRSA report is considered a new case if either of the two conditions are met: not previously reported or any report on the same case more than 30 days apart.

Figure 4 displays the number and rate of new cases of MRSA reported each year in North Dakota from 2000 to 2004. The left Y-axis indicates the number of new MRSA cases. The Right Y-axis displays the MRSA rate per 100,000. In 2004, there were approximately 2.34 cases of MRSA per 1,000 residents in North Dakota. Risk factor analysis may be possible in the future with the collection of more complete data and incorporation of Health Level Seven (HL7) Electronic Reporting. Until that time, it is recommended to base MRSA antibiotic therapy on culture and sensitivity testing.

Figure 4. Number and Rate of New MRSA Cases Reported in North Dakota, 2000-2004.



CDC EIS Officer Applied Epidemiology Training Conducted at the NDDOH

Dr. Dwayne Jarman, one of the newest members to the North Dakota Department of Health, is a lieutenant in the

U.S. Public Health Service Commissioned Corps (www.usphs.gov/) and an Epidemic Intelligence Service (EIS) officer through the Centers for Disease Control and Prevention (www.cdc.gov/eis/). Dr. Jarman is a veterinarian who received his doctorate of veterinary medicine from Michigan State University College of Veterinary Medicine and a master’s in public health degree in epidemiology from the University of Michigan. He will be responsible for projects aimed toward increasing the public health and epidemiologic capacity in North Dakota and the nation.

Dr. Jarman grew up on a small farm in rural Michigan. He is a member of the Grand Traverse Band of Ottawa and Chippewa Indians and is the first in his family to receive a bachelor’s degree or beyond. Dr. Jarman’s interest in public health stems from his personal experiences in life and in school, guidance from his mentors, his interest in diseases that affect animal and humans, and in participation in various national and international public health projects.

Dr. Jarman brings a variety of experiences with him to the North Dakota Department of Health. He and his wife have been North Dakota residents since July 2005. If you have an opportunity, please welcome Dr. Jarman and his wife to the state of North Dakota.

Viral Hepatitis Survey for North Dakota Medical Care Providers Summary of Results

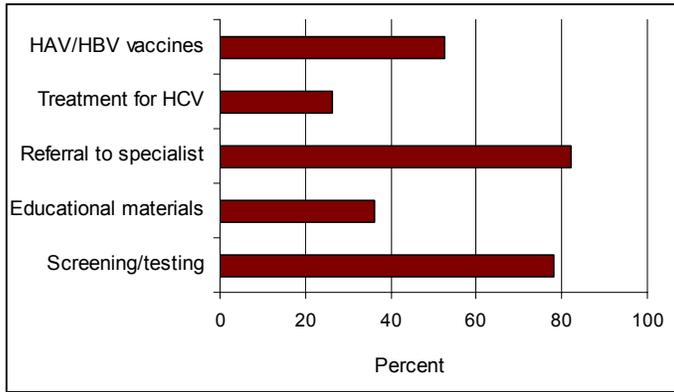
The NDDoH initiated a viral hepatitis program in 2004, with a primary focus of which is to integrating hepatitis C prevention efforts into existing public health programs.

In November 2004, the NDDoH distributed a viral hepatitis survey to medical providers. The information collected from the survey will be used to assess current hepatitis C-related practices, evaluate the current system of disease reporting, develop future hepatitis services and determine direction for future funding.

Surveys were mailed to 590 North Dakota physicians with the following specialties: family practice, internal medicine, infectious disease and gastroenterology. Two hundred seventy-two providers (46 percent) completed the surveys. The survey included questions regarding hepatitis C-related practices, hepatitis services offered and patients tested for hepatitis C, as well as questions about areas of provider training.

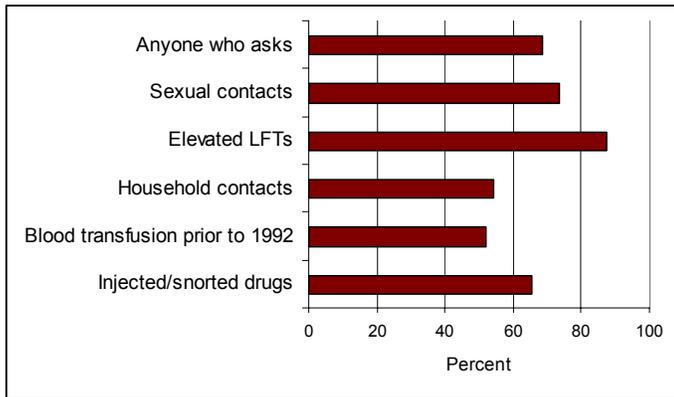
When asked what type of hepatitis C-specific services they provided, 78 percent of providers offered screening and testing, 53 percent offered hepatitis A and B vaccines, 82 percent provided referral to other medical providers, 36 percent offered educational materials and 26 percent offered treatment for hepatitis C (Figure 5).

Figure 5. Hepatitis C-Specific Services Provided.



When asked which patients are tested for hepatitis C, most (88 percent) providers reported testing patients with elevated liver enzymes (ALT/AST), followed by 74 percent test who patients who are sex partners of someone with hepatitis C and 64 percent test patients who admit to ever injecting or snorting drugs (Figure 6). In addition, 69 percent indicated that they test any patient who requests testing, 54 percent reported testing household members of people with hepatitis C and 52 percent test patients who had blood transfusions before 1992. (Figure 6).

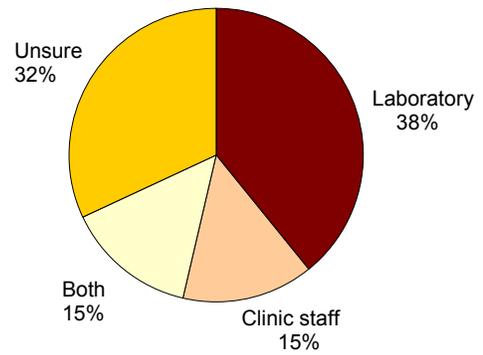
Figure 6. Patients Tested for HCV Infection.



Seventy-six percent and 84 percent of providers indicated that they offered hepatitis A vaccine and hepatitis B vaccine, respectively, to patients with hepatitis C.

When asked who in their practice reports cases of hepatitis C to the NDDoH, about one-third of respondents were unsure (Figure 7).

Figure 7. Reporting of HCV Cases to NDDoH.



When asked if they feel they have adequate and current training in issues concerning viral hepatitis, 81 percent of providers felt confident in their hepatitis A training and 75 percent in their hepatitis B training, compared to only 59 percent regarding training in hepatitis C.

For more information about the survey, contact Kim Weis at kweis@state.nd.us.

2005 Gastroenteritis Outbreaks

In 2005, the NDDoH investigated five gastroenteritis outbreaks. Causative agents of three of the outbreaks were laboratory-confirmed norovirus, *Salmonella* Typhimurium and *E.coli* O157:H7. Causative agents of two of the outbreaks remain unknown. Table 2 on page 7 describes gastroenteritis outbreaks investigated by the NDDoH from 2000 to 2005. Improper cooking and possible cross contamination by ill food handlers were the contributors most commonly identified. A summary of the three laboratory confirmed outbreaks are summarized below.

Norovirus Outbreak at a North Dakota High School, May 2005

In May 2005, the NDDoH received a report of gastrointestinal illnesses involving students and faculty from a high school in Stark County. Approximately 52 students in grades seven through 12 and eight faculty members were absent on the same day, reporting illness of vomiting and diarrhea.

The median incubation period of 32.5 hours involving symptoms of nausea, vomiting, diarrhea and abdominal cramps lasting about 24 hours matches the profile of viral gastroenteritis caused by norovirus. Laboratory testing confirmed norovirus in three stool samples submitted for testing. Reported symptoms and epidemiologic investigation indicate that the lettuce served during lunch two days prior was the most likely source of infection. No samples of lettuce were available for testing.

Additional information about hepatitis can be found on the NDDoH hepatitis website at www.health.state.nd.us/disease/Hepatitis

The environmental investigation reported bare-hand contact by the cooks at the school cafeteria. One of the food workers reported being ill with vomiting and diarrhea and reported to work the following day. The same individual claimed to have chopped the lettuce by hand served at Monday's lunch. Norovirus is often shed in stool for up to 48 hours after diarrhea stops. Improper hand-washing and bare-hand contact with lettuce may be a possible route of contamination.

Salmonella Typhimurium Cluster in Williston

Mercy Hospital in Williston reported a cluster of four *Salmonella* Typhimurium cases in June 2005 that were later found to be associated with consumption of rotisserie chicken purchased hot and ready-to-eat at a local grocery store. Three cases were admitted to the hospital and one patient died. Incubation of the four cases ranged from 23 to 30 hours.

In the following weeks, 11 additional cases were reported that were either epi-linked to the Williston area by time and place or by matching DNA patterns using pulse-field gel electrophoresis (PFGE) testing at the Division of Microbiology. Ten of the 15 *Salmonella* Typhimurium cases reported in this time frame had 100 percent matching DNA patterns. The other five cases matched within 90 percent. However, only one of the 11 additional cases reported consuming rotisserie chicken purchased at the same grocery store as the original cluster. Laboratory confirmation linking cases to the grocery store or its products was not confirmed. No other common denominators were identified between the 15 cases.

Two samples of whole, raw chickens from the same manufacturer but different lot numbers of those purchased by the ill cases were tested for *Salmonella*, as were environmental swabs of the deli and produce departments at the local grocery store. The chicken samples and environmental swabs tested negative for *Salmonella*. The grocery store has implemented safe-food training for all employees and will under-go ongoing environmental assessments. The source of this outbreak remains unknown.

E.coli O157:H7 Cluster in Bismarck

Eleven cases of shiga toxin-producing *Escherichia coli* were reported to the NDDoH with onset dates ranging from Aug. 17 to Sept. 12, 2005. The age range is 2 to 55 years. Nine of the cases live in Bismarck, one case had a travel history to Bismarck and one case from Stark County had no link to Bismarck. Surveillance was enhanced for detection of other cases. No other cases appearing to be part of this cluster were identified.

Isolates were sent to the Centers for Disease Control and Prevention (CDC) and confirmed as serotype O157:H7.

Six of the cases from Bismarck and one case from Stark County matched 100 percent PFGE patterns. Three cases, belonging to the same family (two children and one parent), matched PFGE patterns to each other but not to any of the other cases. One Bismarck case did not match any PFGE patterns in this cluster.

Four cases were associated with one day care located in Bismarck. The daycare received education on exclusion and testing requirements for children and staff who test positive for *E.coli* O157:H7. No other epi-links were found between the other cases in the cluster and this daycare. No food item or water source was implicated as the source of this disease cluster.

The CDC assisted in monitoring for other PFGE patterns nationwide that match the strain of *E.coli* identified in the Bismarck cluster. Ten cases of *E. coli* O157:H7 in Illinois matched PFGE patterns to the cluster identified in Bismarck; however, no epi-link (such as common food items, travel history, etc.) was determined between the North Dakota and Illinois cases.

Although the vehicle of these two disease clusters investigated in 2005 remain unknown, the work on these incidences likely prevented further spread of disease and heightened awareness in the community.

Clusters of gastroenteritis are commonly associated with vehicles that transmit disease, such as food, water or animal contact. Some foods that have been linked to outbreaks reported by the CDC in the past 20 years include milk (*Campylobacter*); shellfish (noroviruses); unpasteurized apple cider (*E.coli* O157:H7); raw and undercooked eggs (*Salmonella*); raspberries (*Cyclospora*); strawberries (hepatitis A virus) and ready-to-eat meats (*Listeria*).

When an outbreak is suspected, samples of stool and/or vomitus, along with possible food items, may be tested free of charge at the Division of Microbiology . Call the NDDoH at 800.472.2180 to report suspected outbreaks of foodborne illness.

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Recognition of Electronic Reporting Efforts

The North Dakota Department of Health Division of Disease Control says *thank you* to the following facilities for submitting electronic data to the department's electronic laboratory reporting system, DREAMS.

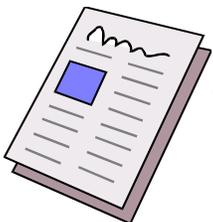
- ◆ Trinity Health
- ◆ MeritCare Health System

Also, a special thanks to the participating RedBat[®] syndromic surveillance facilities:

- ◆ Medcenter One Health System
- ◆ St. Alexius Medical Center
- ◆ MeritCare Health System
- ◆ MeritCare Ask-A-Nurse Calling Center
- ◆ Innovis Health
- ◆ Trinity Health
- ◆ Altru Health System
- ◆ St. Joseph's Hospital and Health Center
- ◆ And soon to be online are Mercy Medical Center (Williston) and Jamestown Health Care Systems.

Your efforts have improved disease reporting, case management and surveillance efforts. Expectations of public health have changed, and technology must be used to meet today's requirements of emergency response and preparedness. These goals would not be achievable without your support and participation.

Thank you!



Note from the Editors:

The *Epidemiology Report* is a bi-monthly publication distributed electronically by the Division of Disease Control of the North Dakota Department of Health. The purpose of this publication is to report North Dakota reportable condition morbidity data and program activities. **In 2006, the *Epidemiology Report* will change from a bi-monthly electronic publication to a quarterly electronic publication.**

The Pump Handle is a monthly news letter that provides brief summaries of Disease Control activities, current events and interesting case investigations or instances. *The Pump Handle* will remain a monthly electronic publication.

Please contact Julie Goplin at 701.328.2375 or jgoplin@state.nd.us to be added or removed from the *Epidemiology Report* and/or *The Pump Handle* mailing lists.

Table 2. Gastroenteritis Outbreaks in North Dakota; 2000-2005

Date	County	Facility	Number Ill	Number Exposed	Suspected Food	Suspected Agent	Contributing Factors
02/2000	Multi-state: ND, MN, MT	Tour group to the Dominican Republic	54	177	Possible eggs	<i>Salmonella</i> Enteritidis	Several meals at the resort implicated epidemiologically
09/2000	Rolette	Girls basketball team	12	36	Possible heat-and-serve burritos	Unknown	Possible psychogenic illnesses involved
3/2001	Ramsey	School	22	64	Classroom snack	Probable norovirus	Unknown
4/2001	Burleigh	Hotel restaurant	101	143	Fruit cup	Probable norovirus	Ill food handler
12/2001	Burleigh	Restaurant/holiday party	8	54	Possible beef tenderloin	Possible <i>Clostridium perfringens</i>	Improperly prepared meat
04/2002	Ward	Restaurant/banquet	119	280	Roast turkey and gravy	<i>Clostridium perfringens</i>	Improperly prepared and reheated turkey/gravy
12/2002	Mercer	Private business	About 100	400	Deep-fried turkey	<i>Clostridium perfringens</i>	Improper food handling and hand-washing
12/2002	Ward	Motel	225	465	Unknown	norovirus	Ill food handlers in addition to person-to-person transmission among guests
12/2002	Pembina	Public school	97	326	Unknown	norovirus	None identified
6/2003	Ward	Restaurant/golf course	34	~ 70	Potato salad	norovirus	Cross contamination
7/2003	Burleigh	Processing plant	3	Unknown	Frozen beef patties	<i>E.coli</i> O157:H7	None identified
10/2003	Grand Forks	Restaurant	14	Unknown	Unknown	<i>E.coli</i> O157:H7	None identified
11/2003	Stark	Wedding/banquet	31	75 – 90	Unknown	norovirus	None identified
12/2003	Ward	Hotel restaurant	24	57	Unknown	Probable food intoxication	None identified
11/2004	Ward	Hotel restaurant	15	43	Unknown	Unknown	Possible sick food handler
11/2004	Bottineau	Restaurant	11	32	Unknown	Unknown	None identified
12/2004	Stark	Local meat store	2	12	Smoked turkey	<i>Salmonella</i> Newport	Inadequate cooking instructions/under cooked
4/2005	Burleigh	Rehearsal dinner/Private Home	14	71	Unknown	Unknown	Unknown
5/2005	Stark	High School	52	249	Lettuce	norovirus	Cross contamination from ill food handler
6/2005	Williams	Unknown	15	Unknown	Unknown	<i>Salmonella</i> Typhimurium	Unknown
7/2005	Ramsey	private home	5	14	Unknown	Unknown	Unknown
8/2005	Burleigh	Unknown	11	Unknown	Unknown	<i>E.coli</i> O157:H7	Unknown

Summary of Selected Reportable Conditions

North Dakota, 2004-2005

Reportable Condition	November-December 2005*	January-December 2005*	November-December 2004	January-December 2004
Campylobacteriosis	3	100	6	105
Chlamydia	213	1,589	294	1,835
Cryptosporidiosis	0	5	0	12
<i>E. coli</i> , shiga toxin positive (non-O157)	2	11	0	7
<i>E. coli</i> O157:H7	0	16	1	15
Enterococcus, Vancomycin-resistant (VRE)	4	25	4	19
Giardiasis	6	25	3	25
Gonorrhea	34	120	14	111
Haemophilus influenzae (invasive)	2	6	1	5
Acute Hepatitis A	0	3	0	2
Acute Hepatitis B	0	0	0	4
Acute Hepatitis C	0	1	0	5
HIV/AIDS	5	19	3	19
Legionellosis	0	7	0	2
Lyme Disease	0	1	0	0
Malaria	1	1	0	3
Meningitis, bacterial ¹ (non meningococcal)	0	4	2	9
Meningococcal disease	1	3	0	2
Mumps	1	5	0	1
Pertussis	24	170	47	757
Q fever	0	0	0	0
Rabies (animal)	4	36	12	75
Salmonellosis	4	86	4	43
Shigellosis	0	3	0	3
<i>Staphylococcus aureus</i> , Methicillin-resistant (MRSA)	94	1,209	268	1,550
Streptococcal disease, Group A ² (invasive)	2	16	4	15
Streptococcal disease, Group B ² (infant < 3 months of age)	0	2	0	3
Streptococcal disease, Group B ² (invasive ³)	6	34	6	38
Streptococcal disease, other ² (invasive)	3	23	1	16
Streptococcal pneumoniae ² , (invasive, children < 5 years of age)	0	6	0	4
Streptococcal pneumoniae ² (invasive ⁴)	5	52	7	54
Streptococcus pneumoniae ² , drug-resistant	1	13	0	0
Tuberculosis	0	6	0	4
West Nile Virus Infection	0	86	0	20

*Provisional data

¹ Meningitis caused by *Staphylococcus aureus* and *Streptococcus pneumoniae*.

² Includes invasive infections caused by streptococcal disease not including those classified as meningitis.

³ Includes invasive infections of streptococcal, Group B, disease in persons \geq 3 months of age.

⁴ Includes invasive infections caused by *Streptococcus pneumoniae* in persons \geq 5 years of age.