

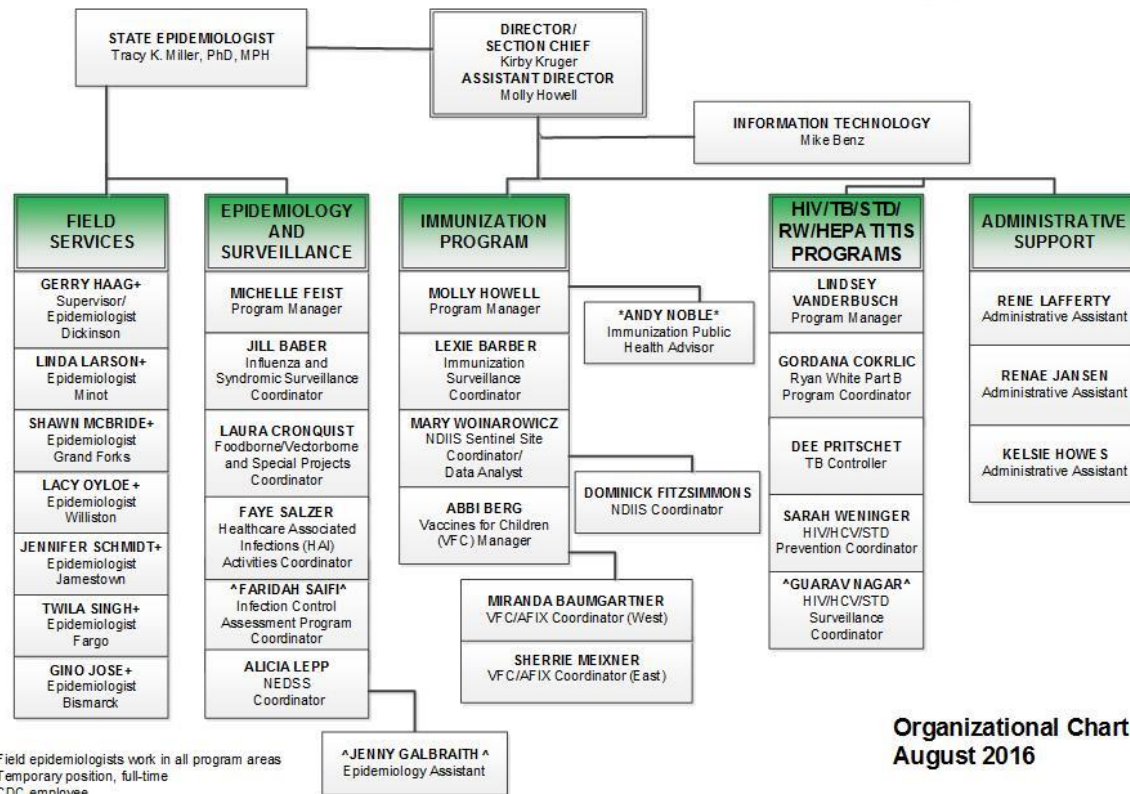
# DISEASE CONTROL: A to Z

Molly Howell, Immunization Program Manager and  
Assistant Director of Disease Control

# NDDoH Disease Control

- The Division of Disease Control is responsible for identifying and analyzing disease trends and implementing appropriate intervention activities to reduce illness and death.
- The division also acts as a resource for health care providers and the public regarding public health issues and often works with the media to provide timely public education.
- Programs include:
  - ▣ Epidemiology and Surveillance
  - ▣ HIV, STD, Tuberculosis and Viral Hepatitis
  - ▣ Immunization
- Health-care providers, laboratories, schools, and child cares statewide notify the division of mandated reportable diseases.
- Division personnel worked closely with private health-care providers and facilities, local public health units, and the public to reduce the incidence of communicable diseases and help ensure the health of North Dakotans.

# Disease Control Organizational Chart

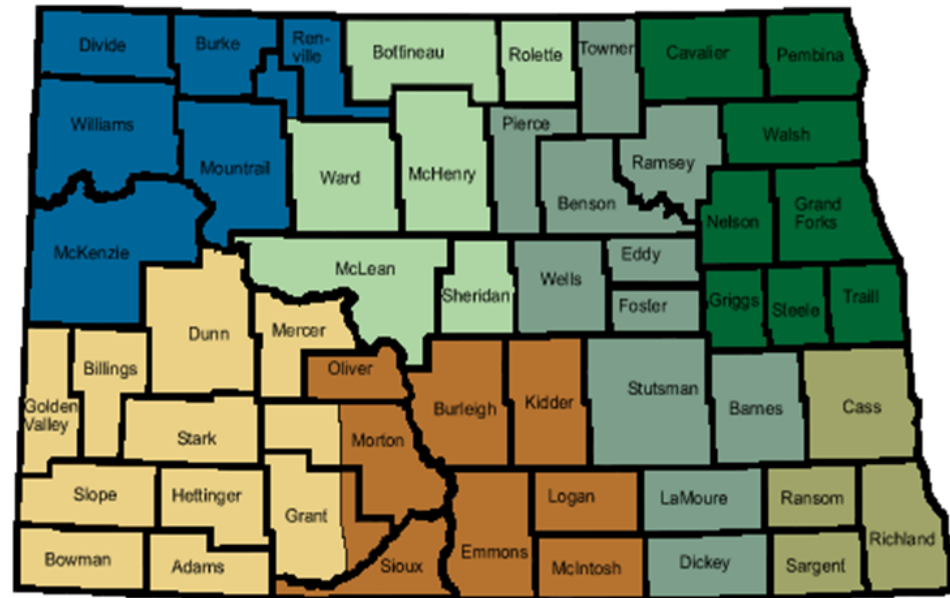


Organizational Chart  
August 2016

# Disease Control Field Epi Map

- Seven field epidemiologists located across the state.
- They conduct case investigations and contact tracing.

2:34:34 PM 8/1/2016

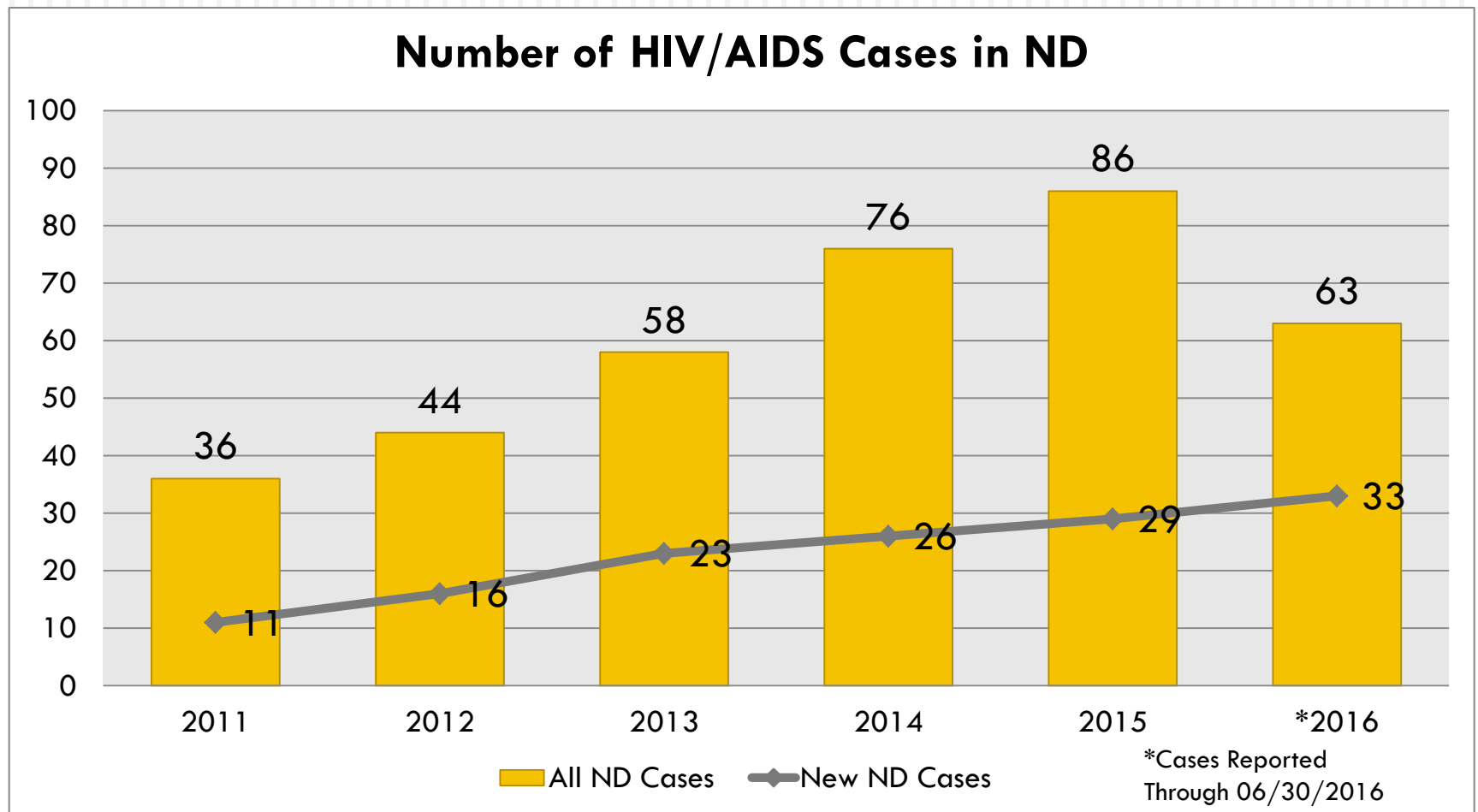


Area	Epidemiologist	Phone
Blue	Lacy Oyløe	774.6405
Light Green	Linda Larson	838.3340
Medium Green	Jennifer Schmidt	252.1325
Dark Green	Shawn McBride	787.8130
Olive Green	Twila Singh	241.1386
Orange	Gino Jose	328.9760
Yellow	Gerry Haag	483.0171

# A – AIDS/HIV

- The NDDoH is seeing an increase in newly diagnosed HIV/AIDS cases.
  - ▣ As of June 30, 2016, 33 cases of newly diagnosed HIV/AIDS have been reported compared to a total of 29 cases in all of 2015.
  - ▣ Since 2011, a 200% increase in HIV/AIDS cases has been reported.
  - ▣ These cases are not isolated to one part of the state.
  - ▣ Risk factors for transmission reported in 2016 include Men who have Sex with Men (MSM), Intravenous Drug Use (IDU), Heterosexual Contact, and Sexual Contact with Person with AIDS.
    - An increase for Intravenous Drug Use (IDU) is being reported for both male and female cases.
    - 41% (9/22) of MSM are less than 30 years of age.

# A – AIDS/HIV



# B – Blue-Green Algae

9:49:43 AM 8/1/2016

[Home](#) > [News](#) > State Health Department Identifies Blue-Green Algae in LaMoure Lakes

## State Health Department Identifies Blue-Green Algae in LaMoure Lakes

July 16, 2016

By: Warren Abrahamson (NewsDakota.com)



BISMARCK, N.D. (NewsDakota.com) – The North Dakota Departments of Health and Agriculture has identified blue-green algae in Lake LaMoure and Twin Lakes, both located in LaMoure County.

The microcystin was analyzed to be in the water. Microcystin is a cyanotoxin caused by blue-green algae. When present in the water, it is dangerous to both people and animals. The level of cyanotoxin is below the state threshold for issuing warnings, but the algae can reproduce rapidly according to the NDDoH.

"The production of blue-green algae often happens in hot weather in bodies of water that are used by people, pets and livestock. Exposure from ingesting affected water can cause illness in people and animals, and can result in death. There are no known antidotes for the toxins," the department reports.

The Department is encouraging individuals to avoid swimming, skiing or fishing in areas where the water is discolored or where you see foam, scum or mats of green or blue-green algae on the water.

For more information, contact the NDDoH at 701-328-5210 or Tony Hanson with LaMoure County Public Health at 701-883-5356.

Attached photo is just an example of Blue-Green Algae and not an actual photo from the lakes.

9:48:41 AM 8/1/2016

## With Soaring Temps Come Blue-Green Algae Warnings



Posted: Fri 5:03 PM, Aug 14, 2015



With this week's soaring temperatures, it's the perfect breeding ground for blue-green algae or cyanobacteria. The North Dakota Department of Health says steer clear of standing water since ingesting it can cause [illness](#) or even death. There is no known antidote for the toxins from the bacteria.

9:48:06 AM 8/1/2016

## Blue-green algae found in western North Dakota lake

By Andrew Haffner on Jul 9, 2016 at 12:45 p.m.



The North Dakota Department of Health issued a warning for Patterson Lake near Dickinson after water samples found dangerous levels of a toxin produced by blue-green algae. Forum News Service photo

DICKINSON, N.D. - A toxic blue-green algae bloom in Patterson Lake has prompted the North Dakota Department of Health to issue a warning urging people to stay out of the water.

# B – Blue-Green Algae

- ❑ Cyanotoxins are a group of toxins produced by several species of cyanobacteria, commonly known as blue-green algae.
- ❑ Cyanobacteria are common in North Dakota lakes, pot holes, agricultural dugouts and slow moving rivers.
- ❑ They thrive and can produce harmful algal blooms (HABs) during periods of warmer weather in nutrient rich waters.
- ❑ Blue-green algal blooms are often described as looking like pea soup or spilled green paint or may appear as “mats” on or just below the surface of the water.



# B – Blue-Green Algae

- These toxins can cause health problems in both humans and animals, including livestock and pets. The syndromes associated with toxin exposure depend both on the type of toxin and the route of exposure.
  - ▣ Incubation periods can be as short as minutes to hours or perhaps up to two days – depending on the toxin, route of exposure and dose.
  - ▣ Exposure to the skin can cause rash, hives, blistering and allergic reactions.
  - ▣ Exposure through ingestion can lead to multiple syndromes, including neurological, hepatic, nephrotic and gastrointestinal signs and symptoms.
  - ▣ Inhalation of the toxin may result in upper respiratory tract irritation, allergic reactions and rhinitis. Inhalation may exacerbate pre-existing conditions such as asthma.
- Disease Control conducts passive and syndromic surveillance for reactions to blue-green algae.

[www.ndhealth.gov/WQ/sw/HABs/defaultHABs.htm](http://www.ndhealth.gov/WQ/sw/HABs/defaultHABs.htm)

# C – Coronavirus (Mers Co-V)

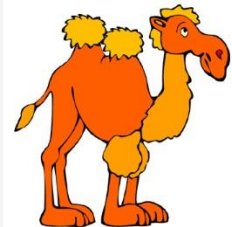
- Middle East Respiratory Syndrome (MERS) is an illness caused by a virus (more specifically, a coronavirus (<https://www.cdc.gov/coronavirus/index.html>) called Middle East Respiratory Syndrome Coronavirus (MERS-CoV).
- Most MERS patients developed severe acute respiratory illness with symptoms of fever, cough and shortness of breath.
- About 3 to 4 out of every 10 patients reported with MERS have died.
- Health officials first reported the disease in Saudi Arabia in September 2012.

# C – Coronavirus (Mers Co-V)

Countries in or near the Arabian Peninsula



- Health care providers should be alert to patients who develop fever and symptoms of respiratory illness within 14 days after traveling from countries in the Arabian Peninsula\* (<https://wwwnc.cdc.gov/travel/notices/watch/coronavirus-arabian-peninsula-uk#footnote>) or neighboring countries, excluding those who transited at airports without entering the countries.
- Most cases associated with health care facilities or camels.



# D – Disease Reporting



- North Dakota Century Code and Administrative Rules require that certain diseases are reported to the NDDoH.
- Reports can be made online, by phone, by fax, and/or electronically (lab reports).
- <http://www.ndhealth.gov/Disease/Disease%20Reporting/Report.htm>

# E – *E. coli*

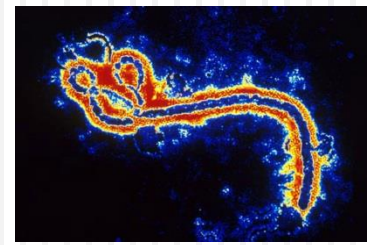
- Over the weekend of July 18, 2015, the NDDoH received a call from a health care provider who was investigating three hemorrhagic *Escherichia coli* (*E.coli*) cases in Cass County.
- Preliminary investigation performed by the healthcare provider indicated that all of these cases had attended the Red River Valley Fair, which ran from July 7, 2015 through July 12, 2015.
- The event was held on the Red River Valley Fairgrounds in West Fargo and included multiple animal barns and food vendors.
- The NDDoH initiated an investigation and developed a standard interview questionnaire.

# E – *E. coli*

Symptom	# of Cases / Total Reporting	% of Cases
Nausea	47/62	75
Abdominal Cramps	43/62	69
Fatigue	34/62	54
Vomiting	30/62	48
Anorexia	29/62	46
Headache	26/62	41
Fever	19/62	30
Bloody Diarrhea	11/62	18

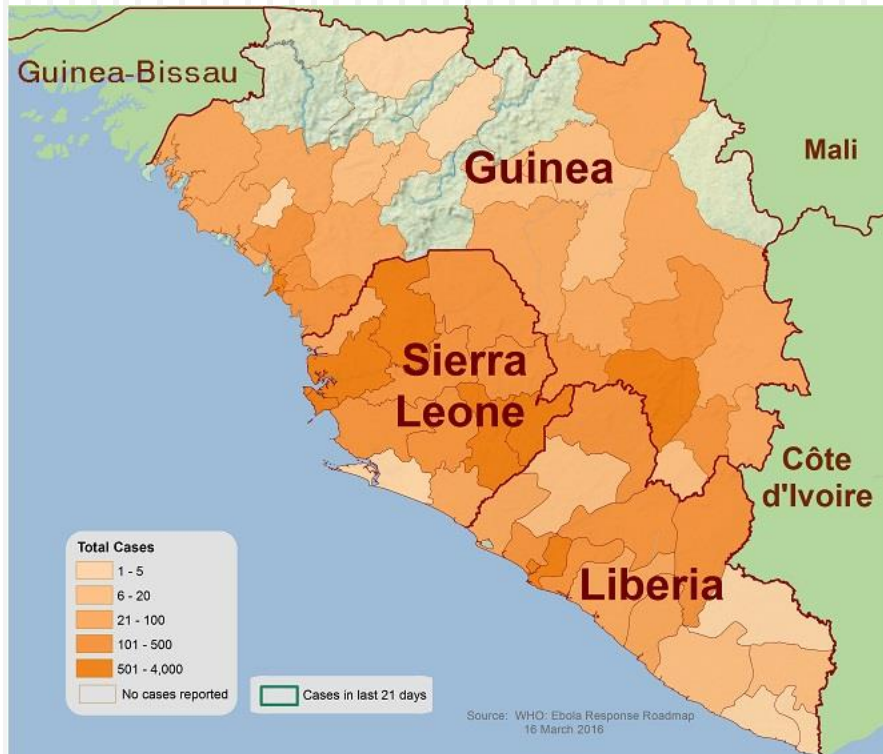
- 116 people completed the online questionnaire.
  - ▣ Five confirmed cases and 59 probable cases were identified for a total of 64 cases.
- The ages of cases ranged from 9 months to 68 years of age (median = 23 years).
- A vehicle of transmission (food vendors, animals, etc.) was unable to be determined in this investigation.

# F – *Filoviridae*



- Ebola, previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus species.
- People get Ebola through direct contact (through broken skin or mucous membranes in, for example, the eyes, nose, or mouth) with
  - ▣ blood or body fluids (including but not limited to urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with or has died from Ebola,
  - ▣ objects (like needles and syringes) that have been contaminated with body fluids from a person who is sick with Ebola or the body of a person who has died from Ebola,
  - ▣ infected fruit bats or primates (apes and monkeys), and
  - ▣ possibly from contact with semen from a man who has recovered from Ebola (for example, by having oral, vaginal, or anal sex).

# F – *Filoviridae*



- Ebola outbreak occurred March 2014 – February 2016 in Guinea, Sierra Leone, and Liberia.
- ▣ A total of 28,616 cases in these three countries with 11,310 deaths.



# F – *Filoviridae*

- Ebola Monitoring:
  - ▣ Disease Control was responsible for monitoring travelers from Ebola-infected countries for 21 days after arrival.
    - 130 individuals
- Ebola Assessments:
  - ▣ Disease Control and Hospital Preparedness have conducted site visits at North Dakota Ebola Assessment Hospitals to ensure proper infection control procedures.

# G – Gastrointestinal Illnesses

- Many enteric/foodborne illnesses are reportable to Disease Control.
  - ▣ *Salmonella*
  - ▣ *E. coli*
  - ▣ *Campylobacter*
  - ▣ *Giardia*
  - ▣ *Shigella*
- Field epidemiologists investigate all cases, including getting food, travel, and other histories.
  - ▣ Looking for source of infection to prevent further spread.

# G – Gastrointestinal Illnesses

- As of July 30, 2015, **four** cases of *Salmonella* Thompson had been identified in Ward County and surrounding area.
  - ▣ 2014 S. Thompson cases in ND: 2
  - ▣ 2013 S. Thompson cases in ND: 0
  - ▣ 2012 S. Thompson cases in ND: 1
- Field staff were alerted and the investigation into the identification of commonalities amongst cases began.
- The following week, **four** additional S. Thompson cases were reported.
  - ▣ Local public health conducted restaurant inspections.
  - ▣ National Hypothesis Generating Questionnaire (NHGQ) was implemented.

# G – Gastrointestinal Illnesses

**Section 6: Sources of food at home:** Now I have a few questions about where the food came from that you ate **at home** in the 7 days before your illness began. This isn't necessarily where you shopped during that week, but where what you actually ate came from. I'm going to list several types of stores, for each type please tell me the names of each store you would have eaten food from during the 7 days before you were sick.

1. Did you (your child) eat foods from?

Grocery stores or Supermarkets	Health food stores or Co-ops
Warehouse stores such as Costco or Sam's Club	Fish or meat specialty shops (butcher's shop, etc.)
Small markets or Mini markets (convenience stores, gas stations, etc.)	Farmer's markets, Roadside stands, Open-air markets, or food purchased directly from a farm
Ethnic specialty markets ( Mexican, Asian, or Indian groceries)	Any other sources of food at home that you ate during the 7 days before your illness began?

List Store/Retail Names and Locations:

**Section 7: Sources of food outside the home:** Now I have a few questions about where the food came from that you ate **outside your home** such as restaurants or fast food chains. I'm going to list several types of restaurant, for each type please tell me the names of each place you would have eaten food from during the 7 days before you were sick.

1. Did you (your child) eat foods from?

National fast food chains	Vegetarian or Vegan	All-you-can-eat Buffet
Mexican-style	Barbeque or Home-style	Sandwich shops or Delis
Italian	Steakhouse or Grill	Any take away/ take-out food
Seafood	Diner or Neighborhood Café	Breakfast or Brunch-style
Jamaican, Cuban, or Caribbean	Middle Eastern, Arabic, Lebanese, or African	A school or other institutional setting
Chinese, Indian, Japanese or other Asian-style	An event where food was served, such as a catered event, food festival, church or community meal, etc.	Any other restaurants or places you might have eaten at in the 7 days before your illness began?

List Store/Retail Names and Locations:

# G – Gastrointestinal Illnesses

**Section 8: Meat and Poultry:** Now I have a few questions about meat and poultry that you (your child) might have eaten in the 7 days before your (your child's) illness began. This does not include canned items, but the meat and poultry could have been fresh, frozen, or could have been eaten as part of dish. You (your child) could have eaten these either in your home or outside the home. As I read each food, please answer as yes, no, may have eaten, or can't remember eating the food in the 7 days before you (your child) got sick.

**First, I have questions about CHICKEN & OTHER POULTRY products.**

YES	Maybe	NO	Don't Know	Did you (your child) eat any:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Whole chicken or cut chicken pieces/parts?
				1a. If eaten <u>at home</u> , what was the: Type, variety, brand: <input type="text"/> Place purchased from (names, locations): <input type="text"/> <input type="checkbox"/> Not applicable (did not eat <u>at home</u> )
				1b. If eaten <u>outside the home</u> , where? List name(s) and location(s): <input type="text"/> <input type="checkbox"/> Not applicable (did not eat <u>outside the home</u> )
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Ground chicken?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Breaded chicken products, such as chicken tenders, strips, or nuggets?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Stuffed, frozen chicken products, such as chicken Kiev or chicken Cordon Bleu?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Any other frozen chicken products?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Duck, game hen, or squab?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Whole turkey or cut turkey pieces/parts?
				7a. If eaten <u>at home</u> , what was the: Type, variety, brand: <input type="text"/> Place purchased from (names, locations): <input type="text"/> <input type="checkbox"/> Not applicable (did not eat <u>at home</u> )
				7b. If eaten <u>outside the home</u> , where? List name(s) and location(s): <input type="text"/> <input type="checkbox"/> Not applicable (did not eat <u>outside the home</u> )
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Ground Turkey?
<b>Section 8 Chicken/Poultry Comments.</b> Please fill in comments/notes from this section in the space provided				<input type="text"/>

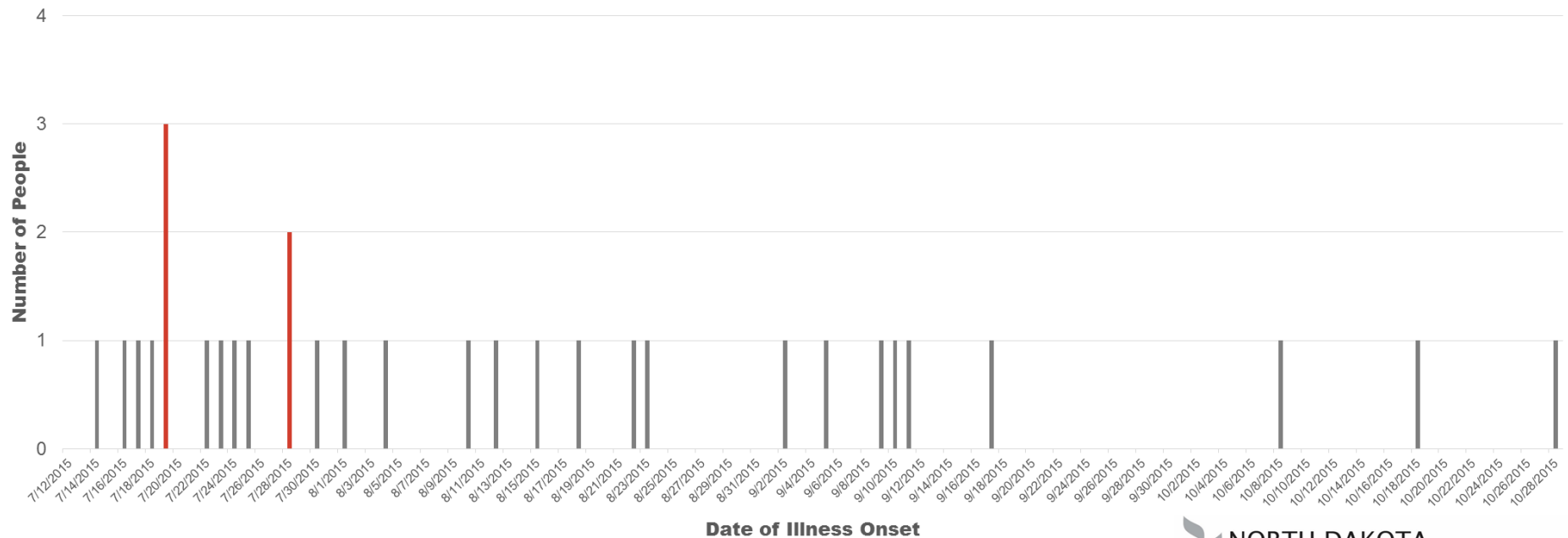
# G – Gastrointestinal Illnesses

- **Overview of Salmonella Thompson Outbreak:**
  - **Number of PFGE matched cases: 33**
  - **Onset**
    - Range: 7/14/15—10/28/2015\*
  - **Age**
    - Range: 3—71 years
    - 70% of cases are between 18—40
  - **Gender**
    - Female: 20 (61%)
    - Male: 13 (39%)

*\*Onset unknown for 2 cases*

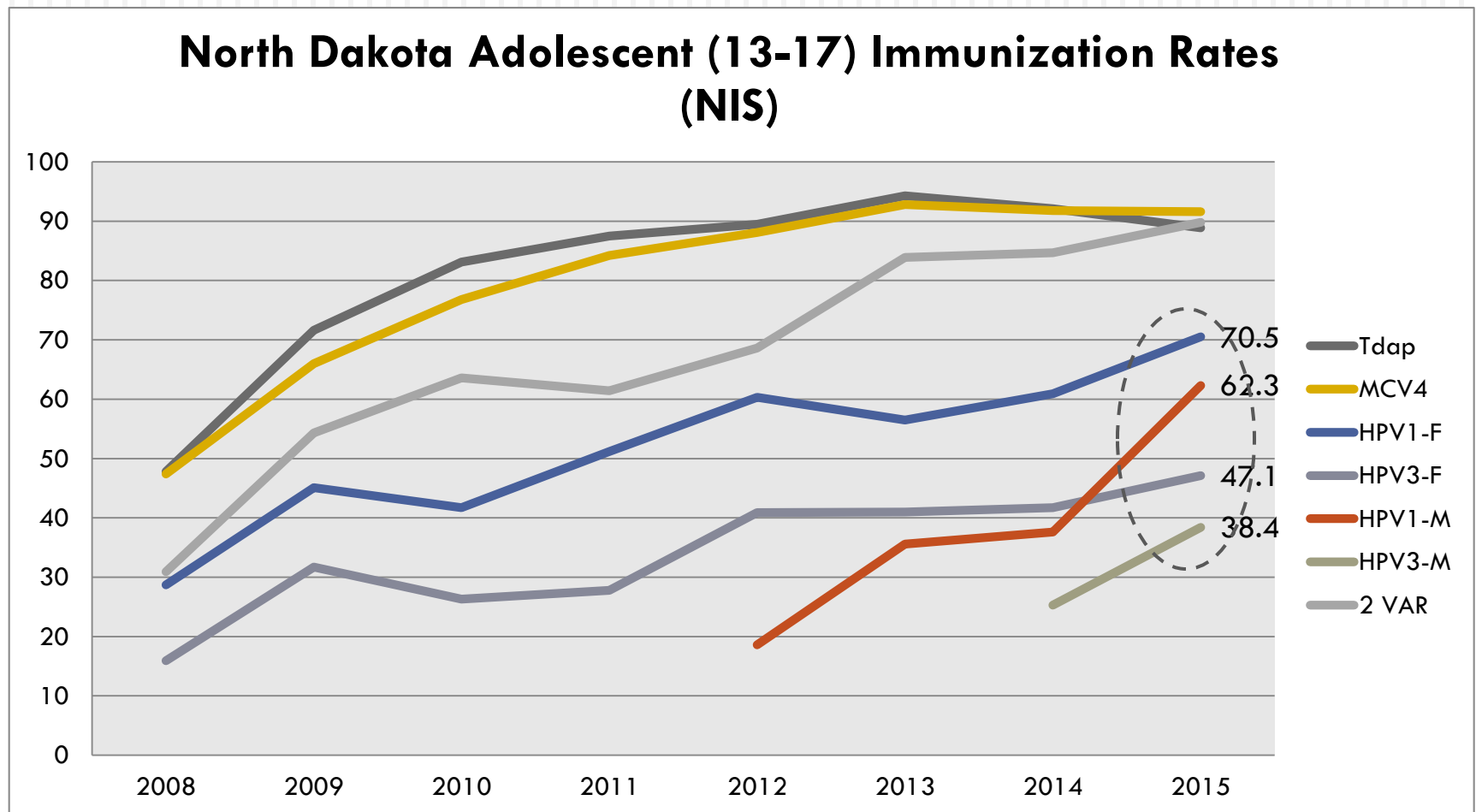
# G – Gastrointestinal Illnesses

People infected with the outbreak strain of *Salmonella* Thompson, by date of illness onset\*



\*n=31 for whom information was reported

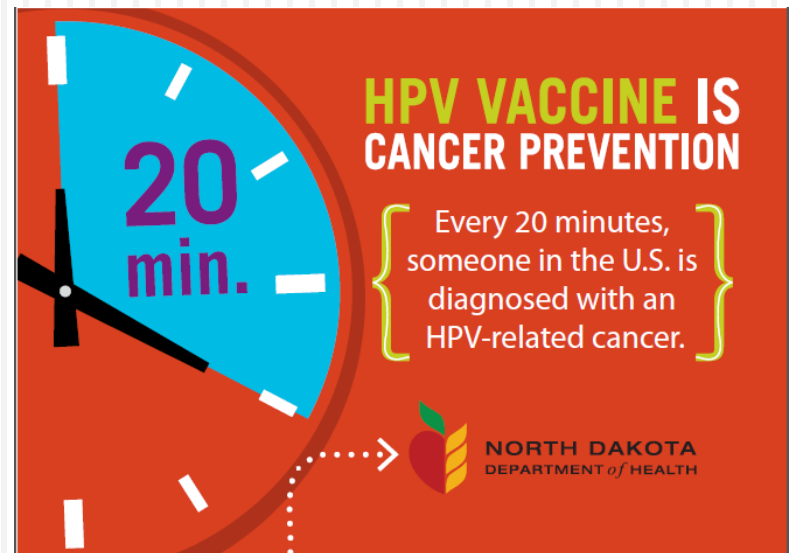
# H – HPV Vaccination





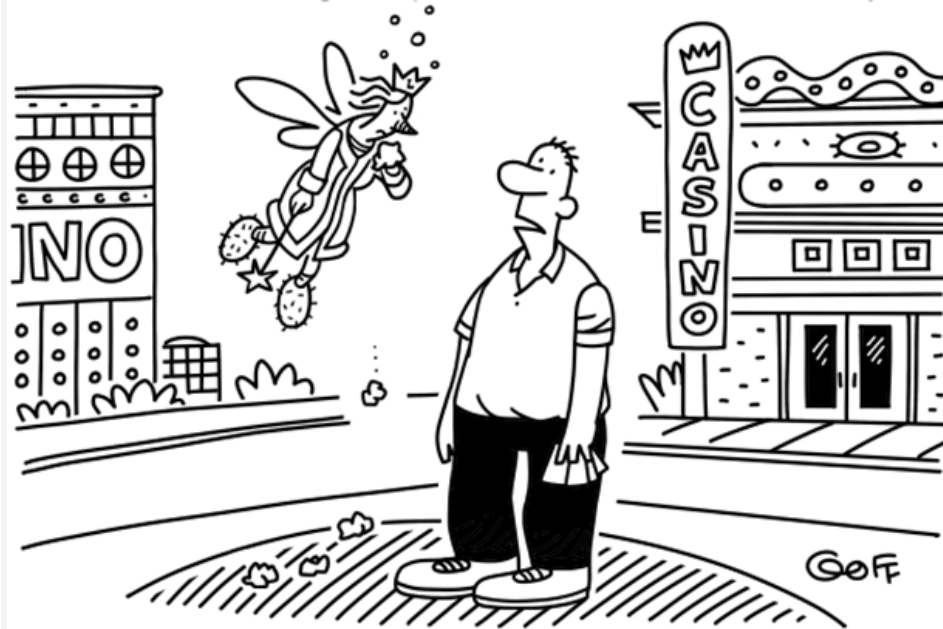
# H – HPV Vaccination

- The immunization program is working with partners to increase HPV immunization rates.
- Activities include:
  - ▣ School-located clinics
  - ▣ Postcard Reminders
  - ▣ Recall for 2<sup>nd</sup> and 3<sup>rd</sup> doses
  - ▣ Provider education
  - ▣ Quarterly rate report cards
  - ▣ Media campaign



# I - Influenza

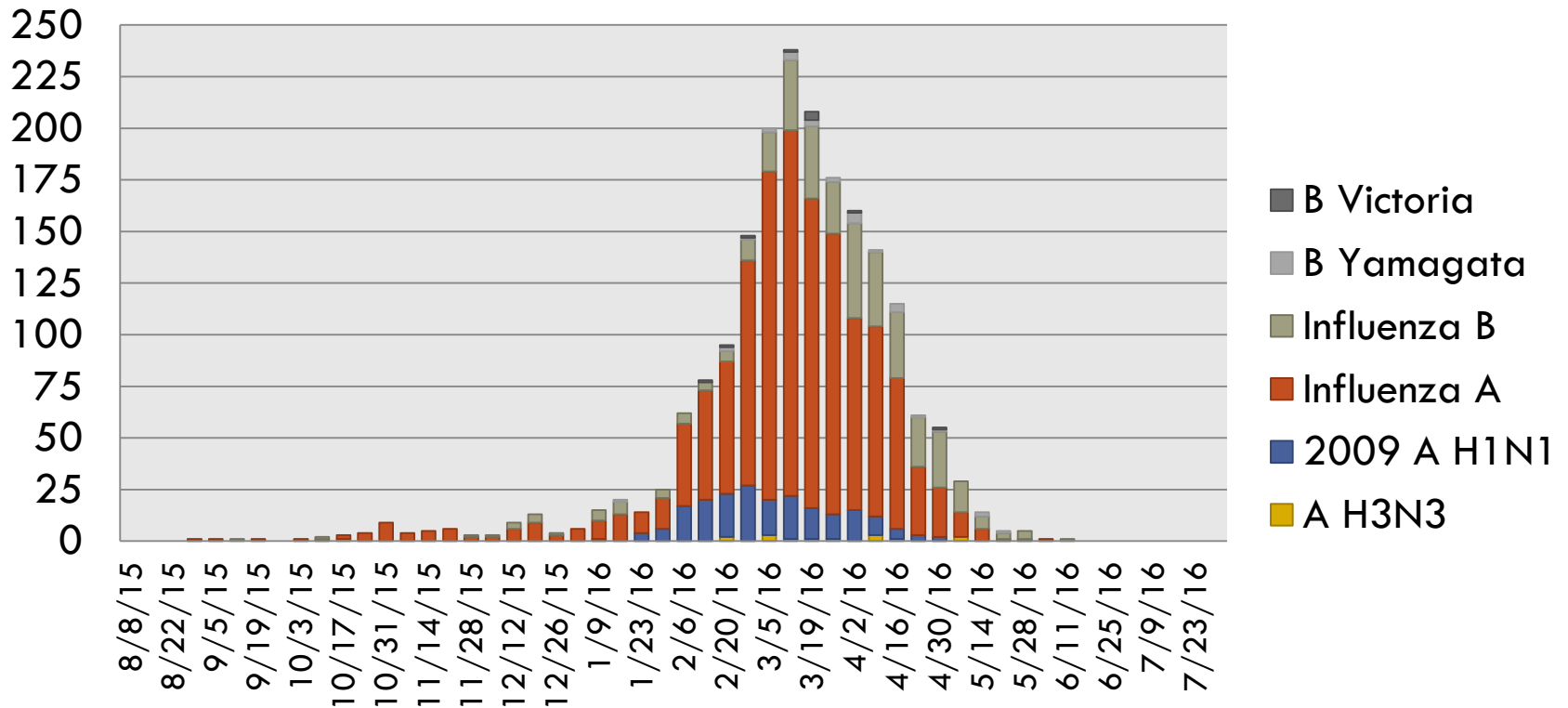
Brought to you by the Immunization Ambassadors community  
© 2016 Scientific Technologies Corporation [www.stchome.com](http://www.stchome.com) Twitter: #WhyIVax



“Lady Luck, didn’t you get vaccinated? You can’t gamble with the flu!”

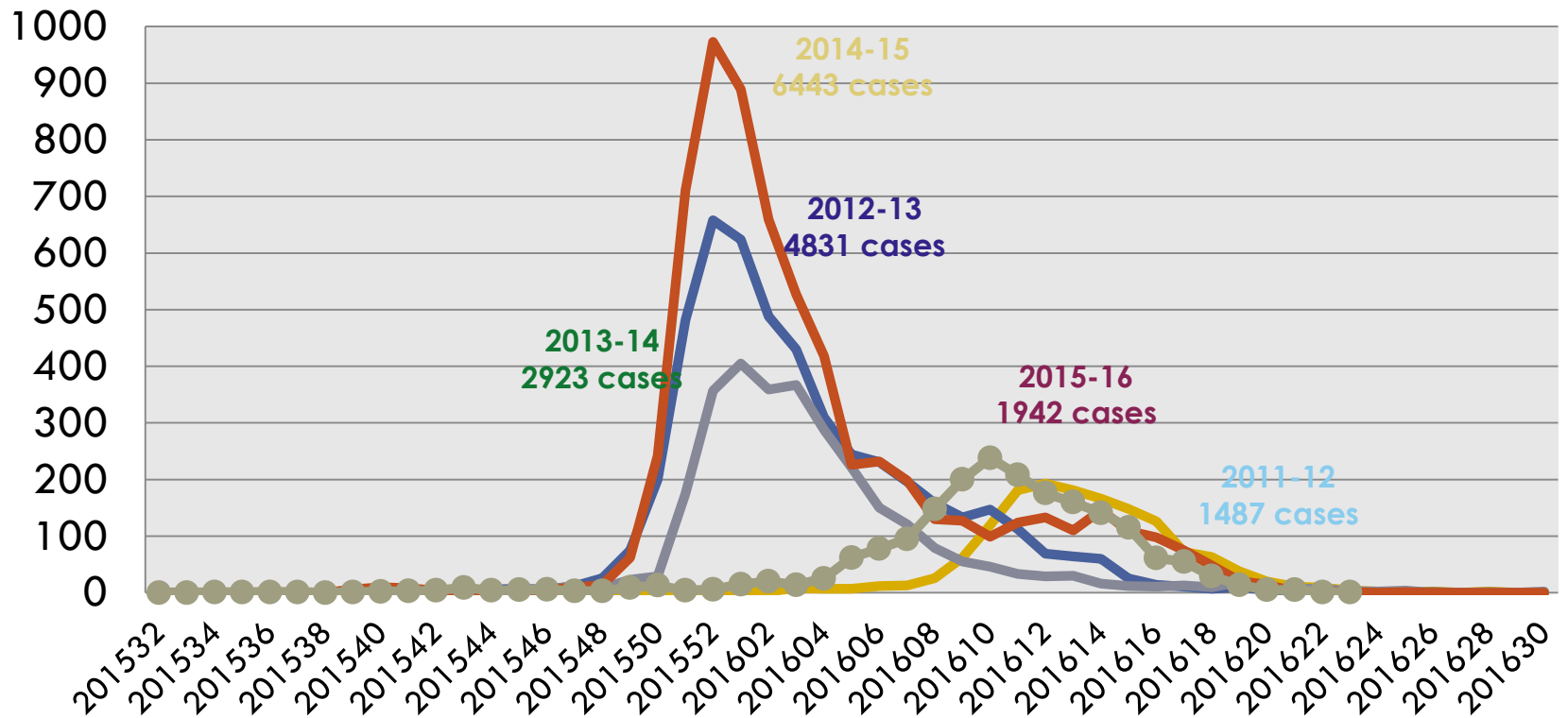
# I – Influenza

**Number of Reported Laboratory-Identified Influenza Cases Reported by Week, North Dakota 2015-16 Season**



# I – Influenza

## North Dakota Influenza Cases by Week, 2011-Current Season



# I – Influenza

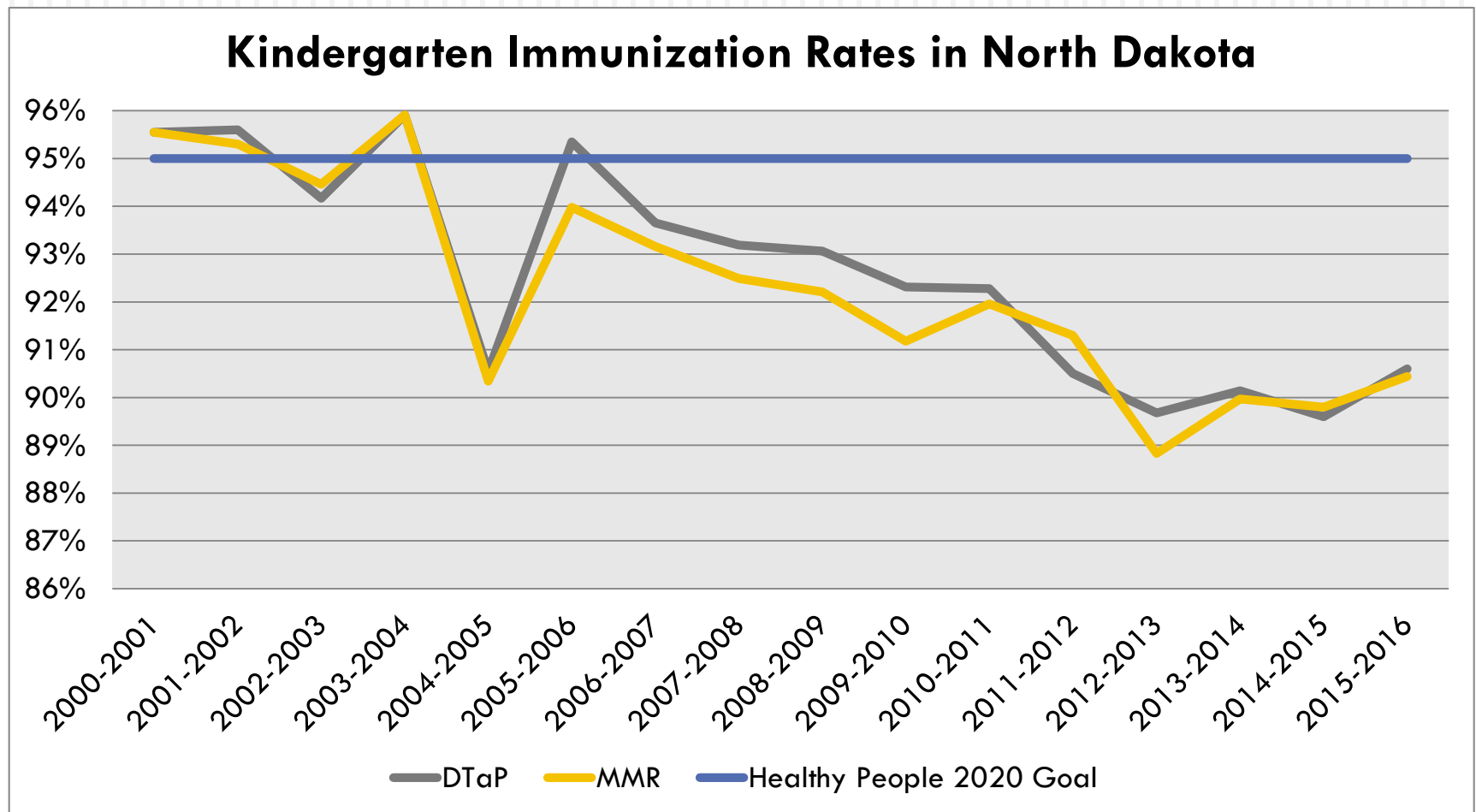
- Live Attenuated Influenza Vaccine (LAIV or Flumist<sup>®</sup>) for the 2016 – 2017 flu season.
  - ▣ In June, the Advisory Committee on Immunization Practices (ACIP) recommended against the use of LAIV for the upcoming flu season.
    - LAIV vaccine effectiveness was poor during the last three flu seasons.
      - 2015 – 2016 Season: LAIV had 3% VE vs. IIV having 63% VE
  - ▣ Providers should replace LAIV with IIV.
  - ▣ Unknown cause for low VE

# J – Joint Ventures

- NDSU
  - ▣ School Immunization/Exemption Project
- ND DPI
  - ▣ Increasing school immunization rates
- ND State Vet
  - ▣ Antibiotic resistance, rabies, tick surveillance, bird flu
- ND Game and Fish
  - ▣ Rabies
- CDC
  - ▣ Human Metapneumovirus, Hepatitis C

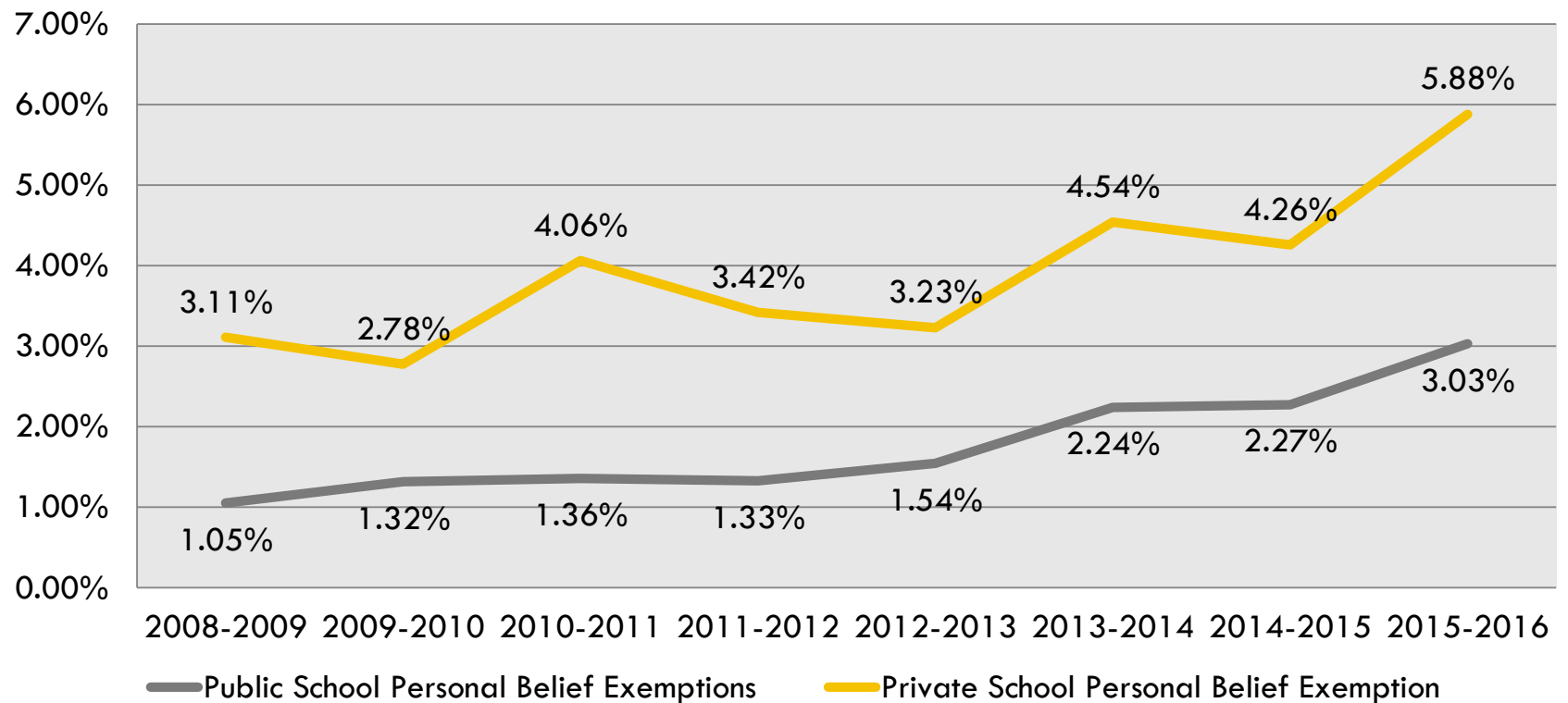


# K – Kindergarten Immunization Rates



# K – Kindergarten Immunization Rates

## Public vs Private school Personal Belief Exemption Rates





# L – Legionnaire's Disease

- Legionellosis is a bacterial disease caused by *Legionella pneumophila* that can cause mild respiratory illness or pneumonia.
- The disease most often affects people who are elderly, current or former smokers, have weakened immune systems, or have underlying illnesses such as chronic lung disease, cancer, diabetes, or kidney failure.
- People can get Legionnaires' disease when they breathe in a mist or small droplets of water in the air that contains the bacteria.
  - ▣ The bacteria grow best in warm water, like the kind found in hot tubs, cooling towers, hot water tanks, or parts of the air-conditioning systems of large buildings.
- Legionnaires' disease is named after a large outbreak at an American Legion convention in Philadelphia in 1976.

# L – Legionnaire's Disease

- In November 2015, Disease Control investigated two possible travel-related cases of Legionnaires' disease.
  - ▣ Two unrelated people developed Legionnaires' disease within ten days of staying at the same hotel in Ward County in September.
    - Both cases required hospitalization
- An environmental assessment was conducted and various samples were collected from three guest rooms, including the two rooms visited by the cases, and water from the pool and hot tub.
  - ▣ A total of twelve samples were collected from the pool, hot tub, roof-top vents, and guest room shower heads, sinks and air conditioner units.
  - ▣ No *Legionella* was isolated from any of the environmental samples collected.

# M – Mumps

- In early 2016, a mumps outbreak occurred in North Dakota.
  - ▣ Most cases in Ward County.
  - ▣ Vaccination Status:
    - 2 doses MMR: 8
    - 1 dose MMR: 4
    - Unvaccinated: 10
    - Unknown: 20



# M – Mumps

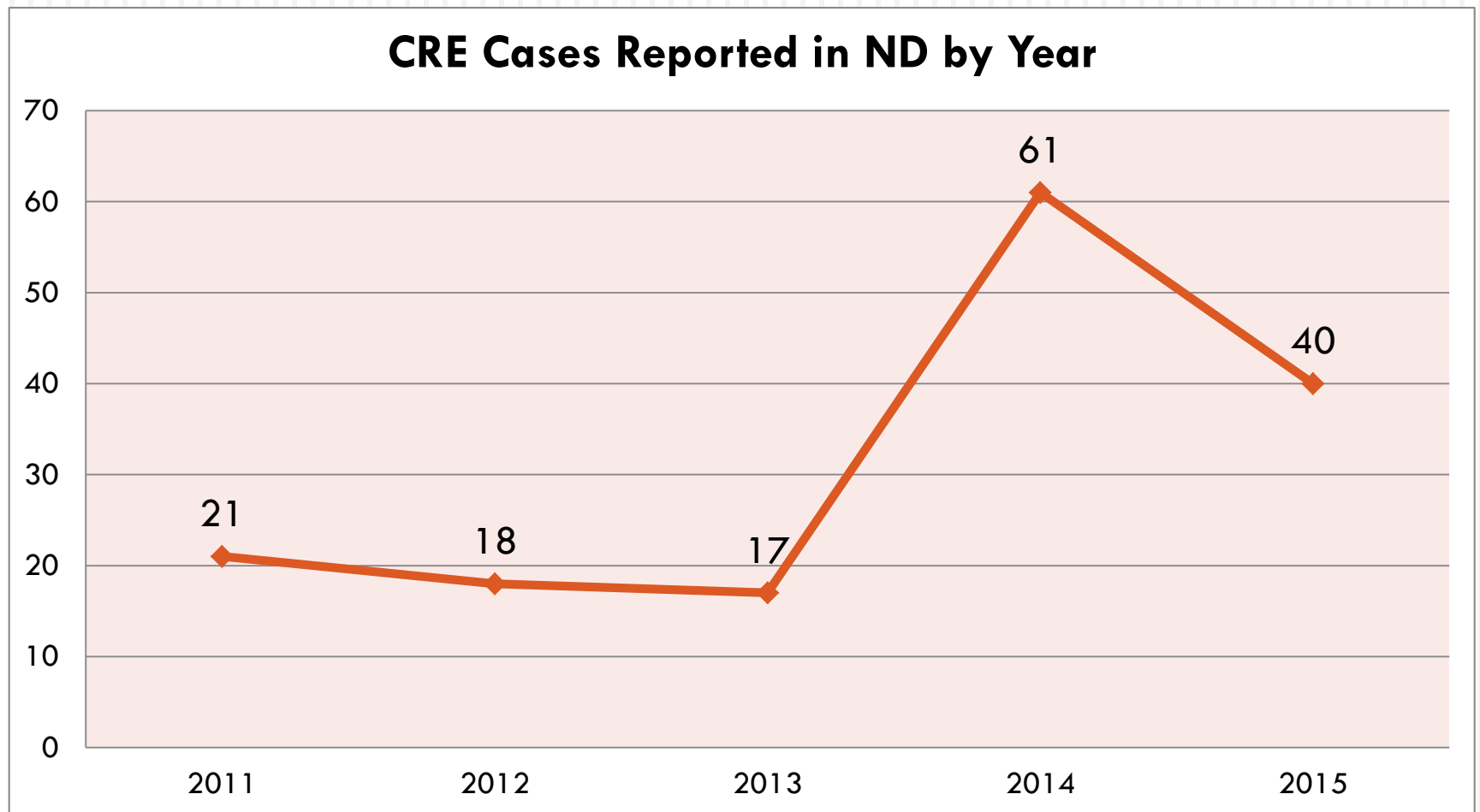
<b>Mumps State Data - 2016</b>	
Total Cases	42
Confirmed	6
Suspect	33
Probable	3
Gender	
Male	14
Female	28
Last Updated	07/29/2016

<b>Mumps Age Group - 2016</b>	
<10	3
10-17	2
18-24	5
25-39	12
40-59	12
>=60	8

# N – Nosocomial Infections

- 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 *E. coli*
- 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.

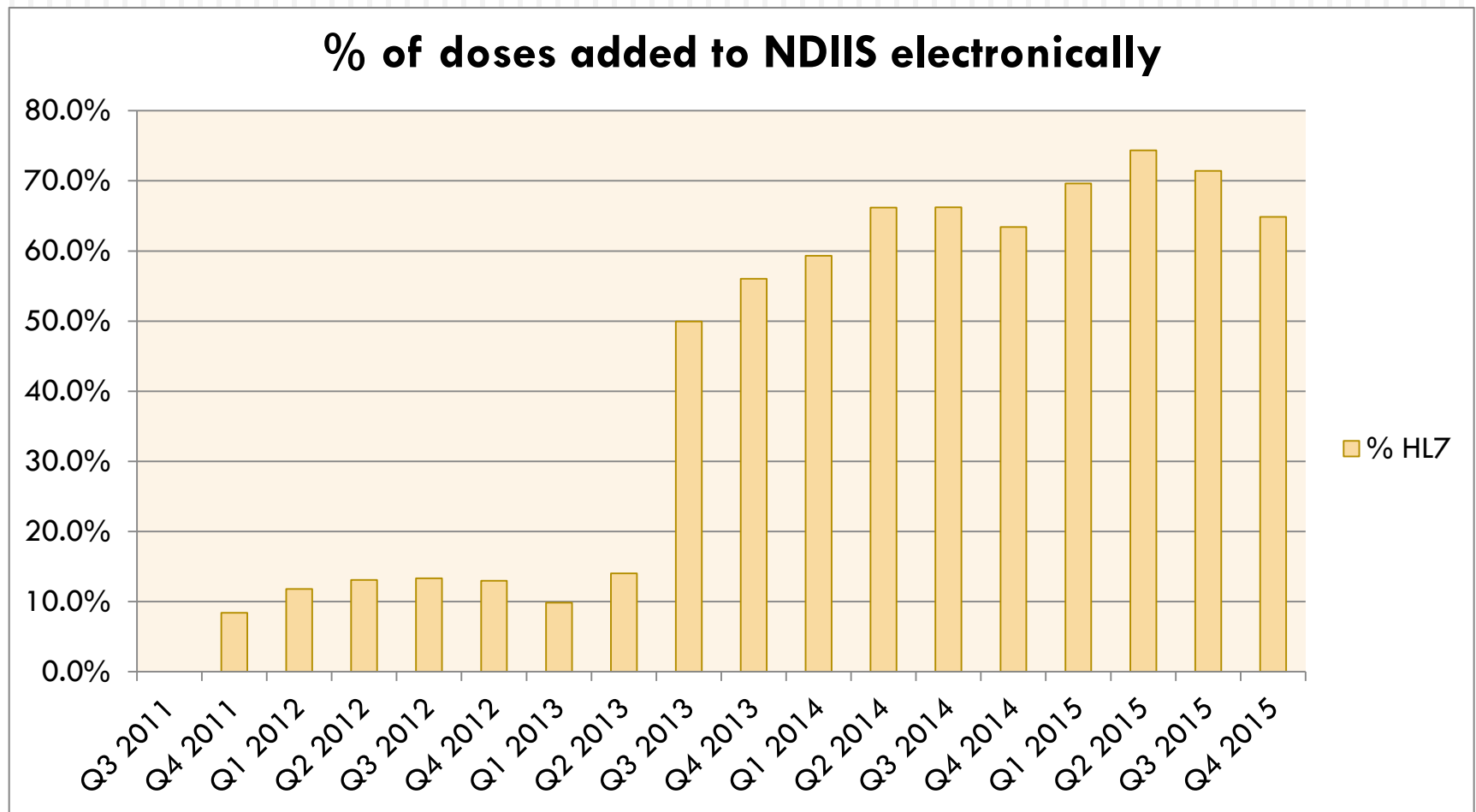
# N – Nosocomial Infections



# O – OMG Technology!

- NDIIIS: North Dakota Immunization Information System
- MAVEN: Disease Surveillance System
  - ▣ Electronic laboratory reporting
- Syndromic Surveillance
- Hospital Discharge Data
- NHSN

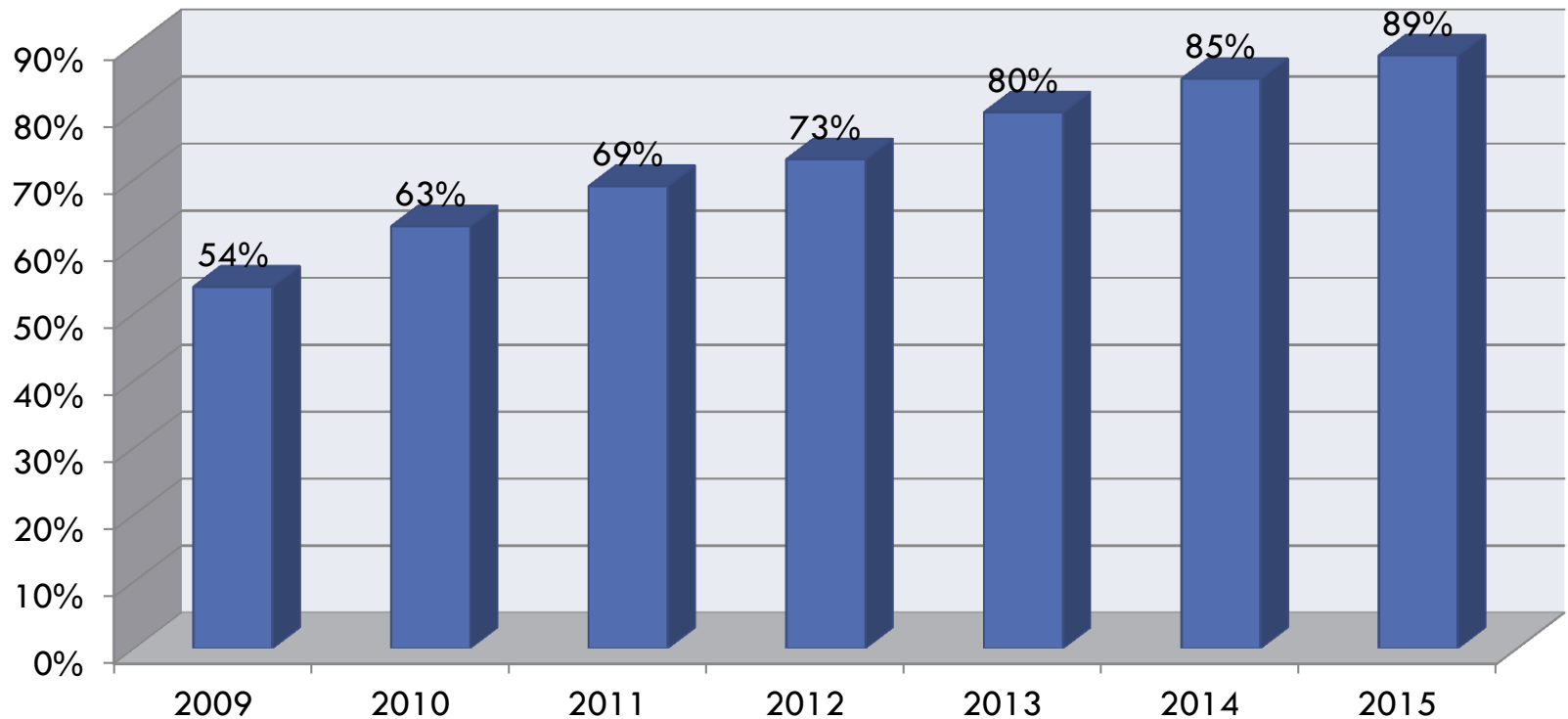
# O – OMG Technology!





# ○ – OMG Technology!

**Percent of adults 19 years of age and older with at least one adult administered dose of vaccine in the NDIIS**

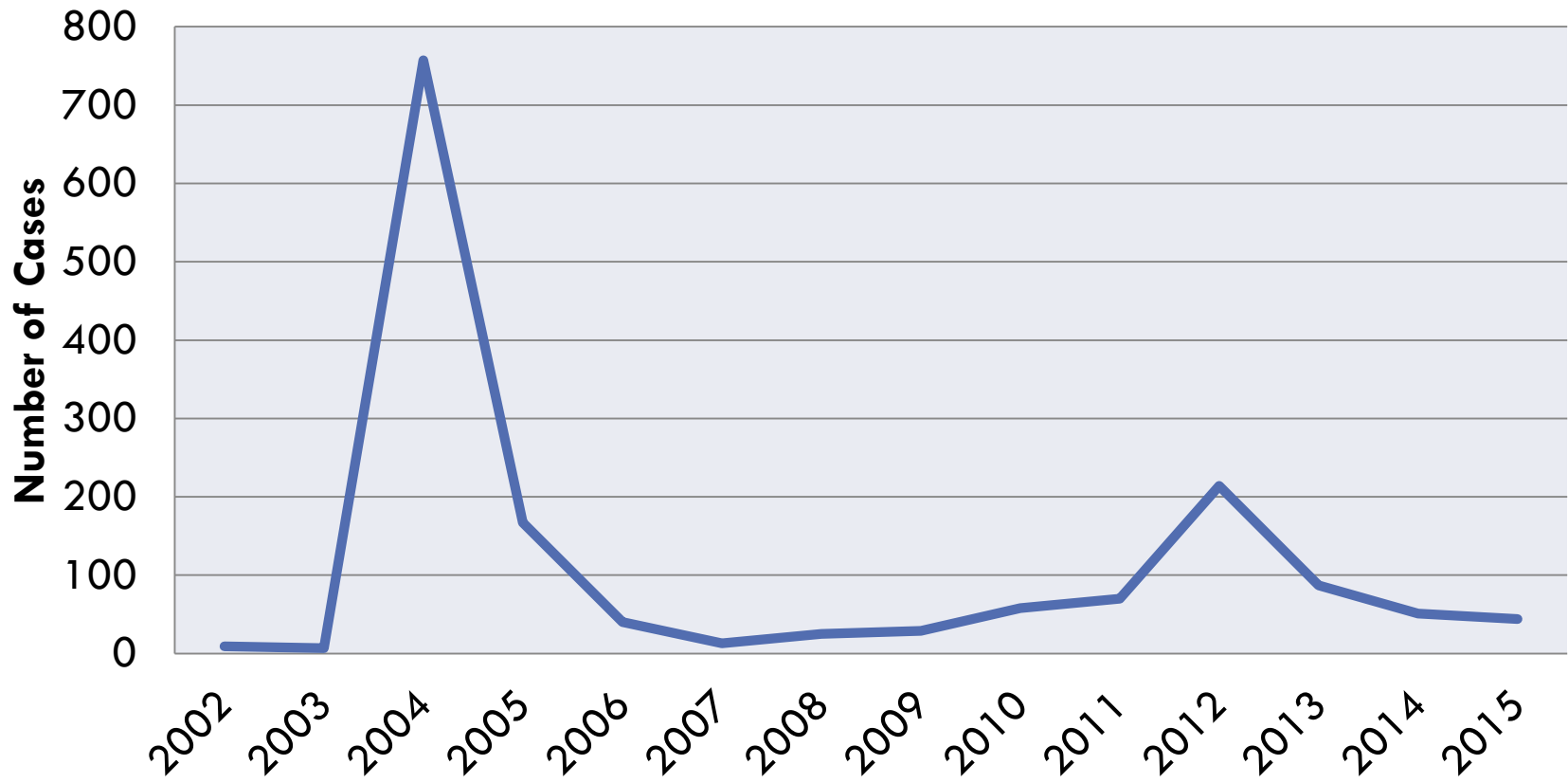


# P - Pertussis

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

# P - Pertussis

## Pertussis Cases in North Dakota 2002-2015



# Q – Questions?

- We are here to help with any questions you may have. Examples include:
  - ▣ What is the minimum interval between doses of HPV?
  - ▣ Needle stick Injuries—What should I do?
  - ▣ I'm thinking this disease, what tests should I order?
  - ▣ What do I do for an animal bite?
  - ▣ You've got a question, we will help find the answer!
  
- 701.328.2378 or 800.472.2180

# R – Rabies

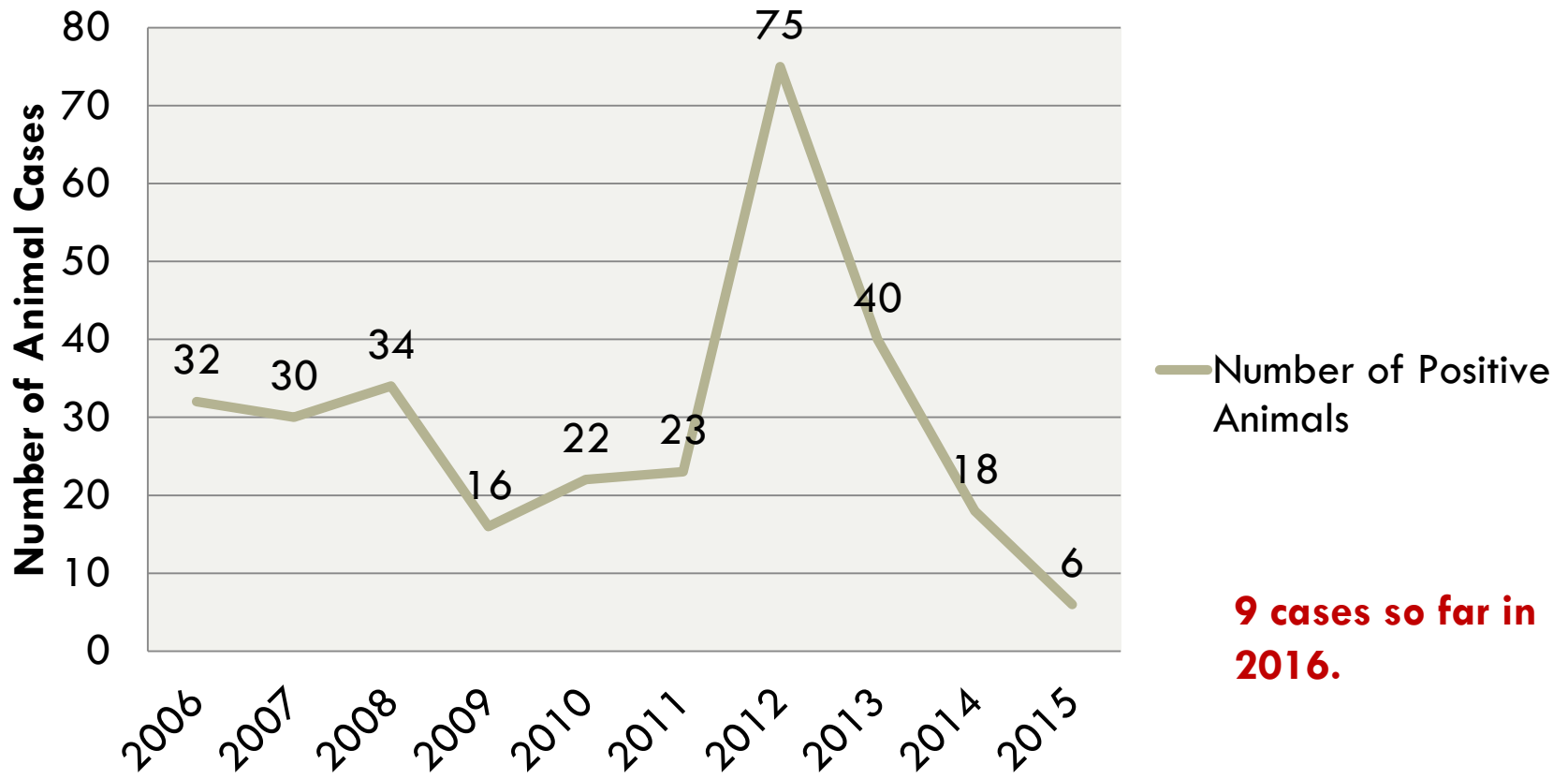
- Disease Control takes calls from providers and the public regarding rabies exposures.
- Staff assess the exposure and make recommendations for animal testing, quarantine, and post-exposure prophylaxis.

2016 Rabies Positive Animals					
County	Bat	Cow	Skunk	Cat	Total
Adams	0	0	1	0	1
Cass	0	0	0	1	1
Kidder	0	1	0	0	1
McHenry	0	0	1	0	1
McIntosh	0	0	1	0	1
McLean	0	0	1	0	1
Pierce	0	1	0	0	1
Stutsman	0	1	0	0	1
Ward	0	0	1	0	1
State	0	3	5	1	9

# R - Rabies

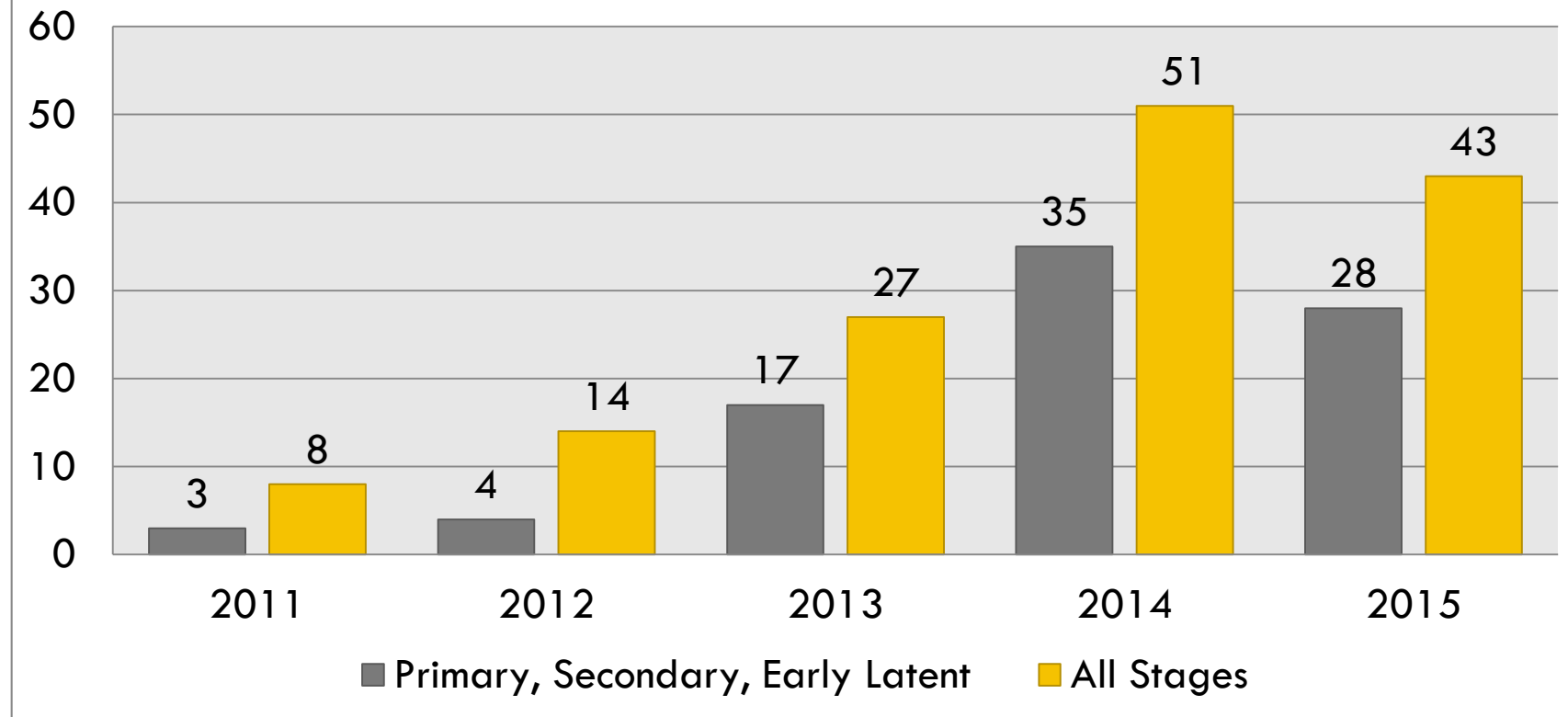


**Cases of Animal Rabies in North Dakota by Year, 2006-2015**

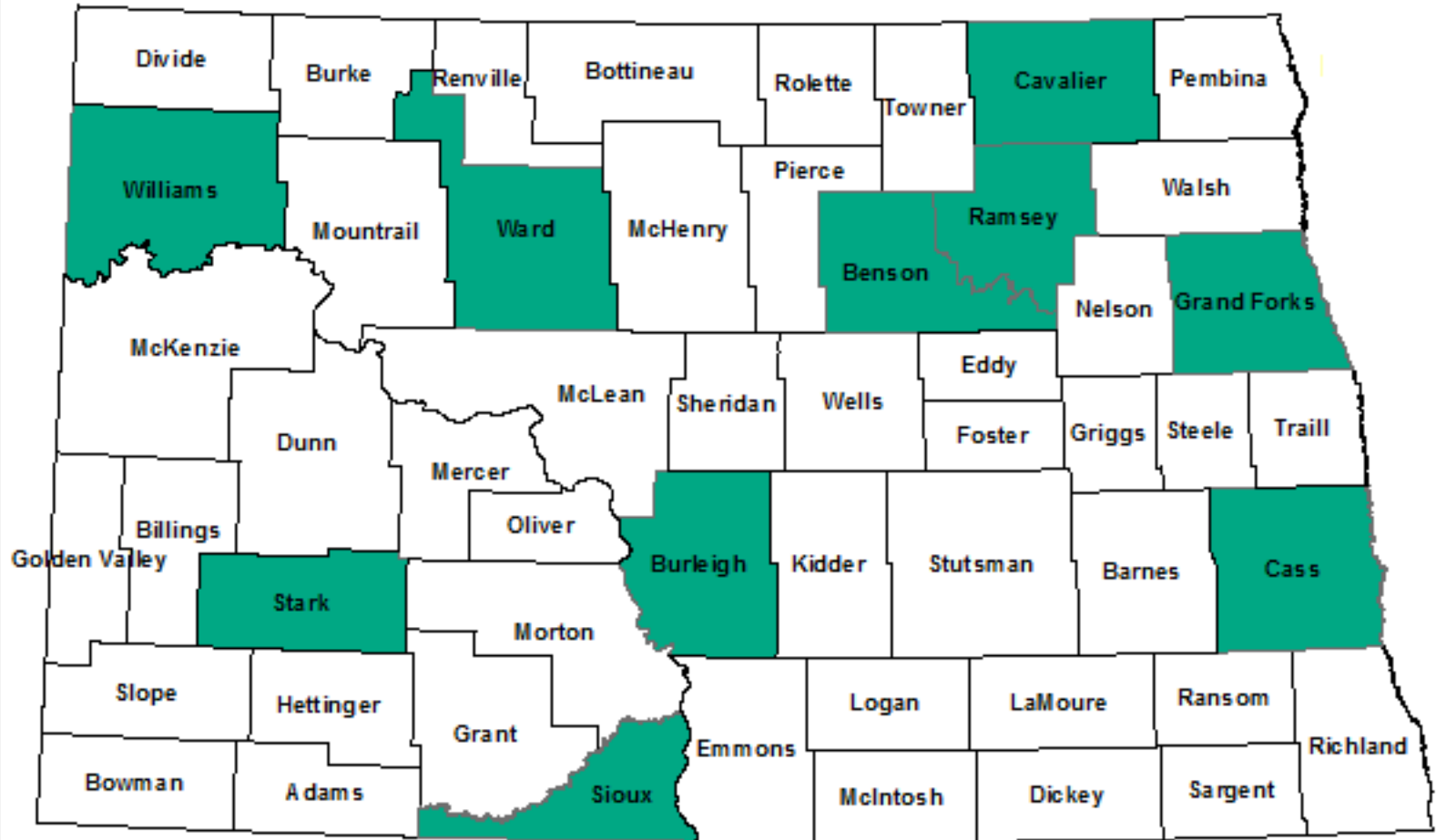


# S – Syphilis

**Reported Syphilis Cases by Year  
North Dakota, 2011-2015**



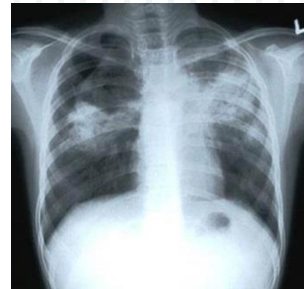
# S – Syphilis





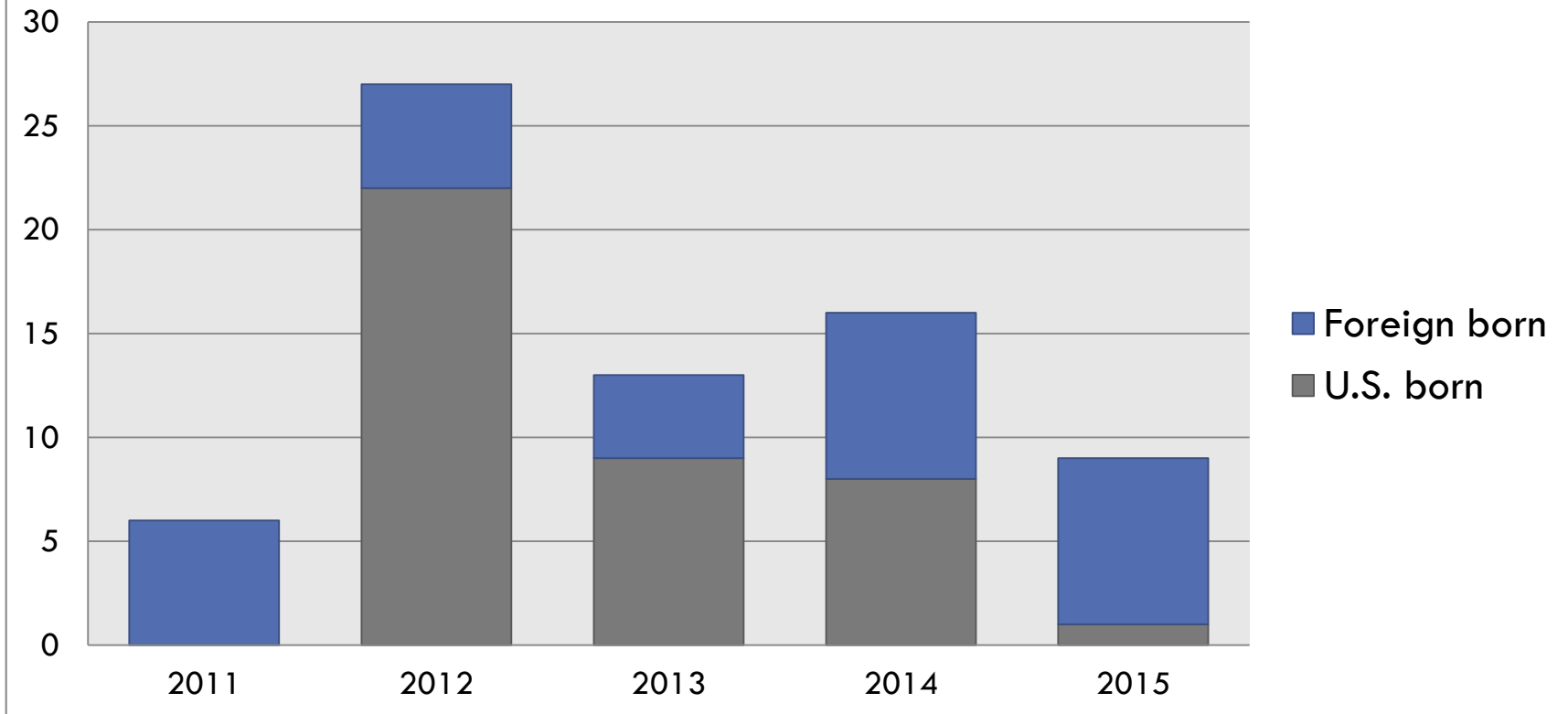
# T – Tuberculosis

- TB is a bacterial disease caused by *Mycobacterium tuberculosis*.
  - ▣ TB usually affects the lungs but it can also affect other parts of the body such as the brain, lymph nodes, kidneys, bones, joints, larynx, intestines or eyes.
  - ▣ TB outside the lungs is referred to as extrapulmonary TB.
- In North Dakota in 2015, there were 9 cases (1.2 cases per 100,000 people) of infectious tuberculosis (active) identified and 544 cases of tuberculosis infection only (latent).
- In 2015, the number of reported TB cases in the United States increased for the first time in 23 years, for a total of 9,563 cases of infections tuberculosis (3.0 cases per 100,000 people)



# T – Tuberculosis

**Number of active TB cases reported in North Dakota, 2011-2015**



# U – Utilizing Students

- Disease Control collaborates with schools of public health to mentor students.
- 2016 projects:
  - Evaluation of immunization reminder/recall
  - Evaluation of influenza and pneumococcal deaths
  - Assessment of the prevalence of HPV
  - Evaluation of clinically diagnosed influenza and syndromic surveillance
  - Improve childhood influenza case information
  - Implementation of tick surveillance

# V – Varicella (Chickenpox)

## Case Identification Results per Hospital System

Findings	Hospital A	Hospital B	Total
Days until Data Acquisition	34	25	
ICD9 Codes Identified	052.9	052.9	
	052.7		
		647.63	
Records Reviewed	89	26	115
Records Meeting Case Definition	63	21	84
Previously Reported Cases	4	2	6
Cases Residing out of Jurisdiction	7	4	11
Incorrect use of ICD9 Codes	2	4	6
<b>New Cases Not Previously Identified</b>	<b>60</b>	<b>16</b>	<b>66</b>

# W – West Nile Virus

Brought to you by the Immunization Ambassadors community

© 2016 Scientific Technologies Corporation [www.stchome.com](http://www.stchome.com) Twitter: #WhyIVax



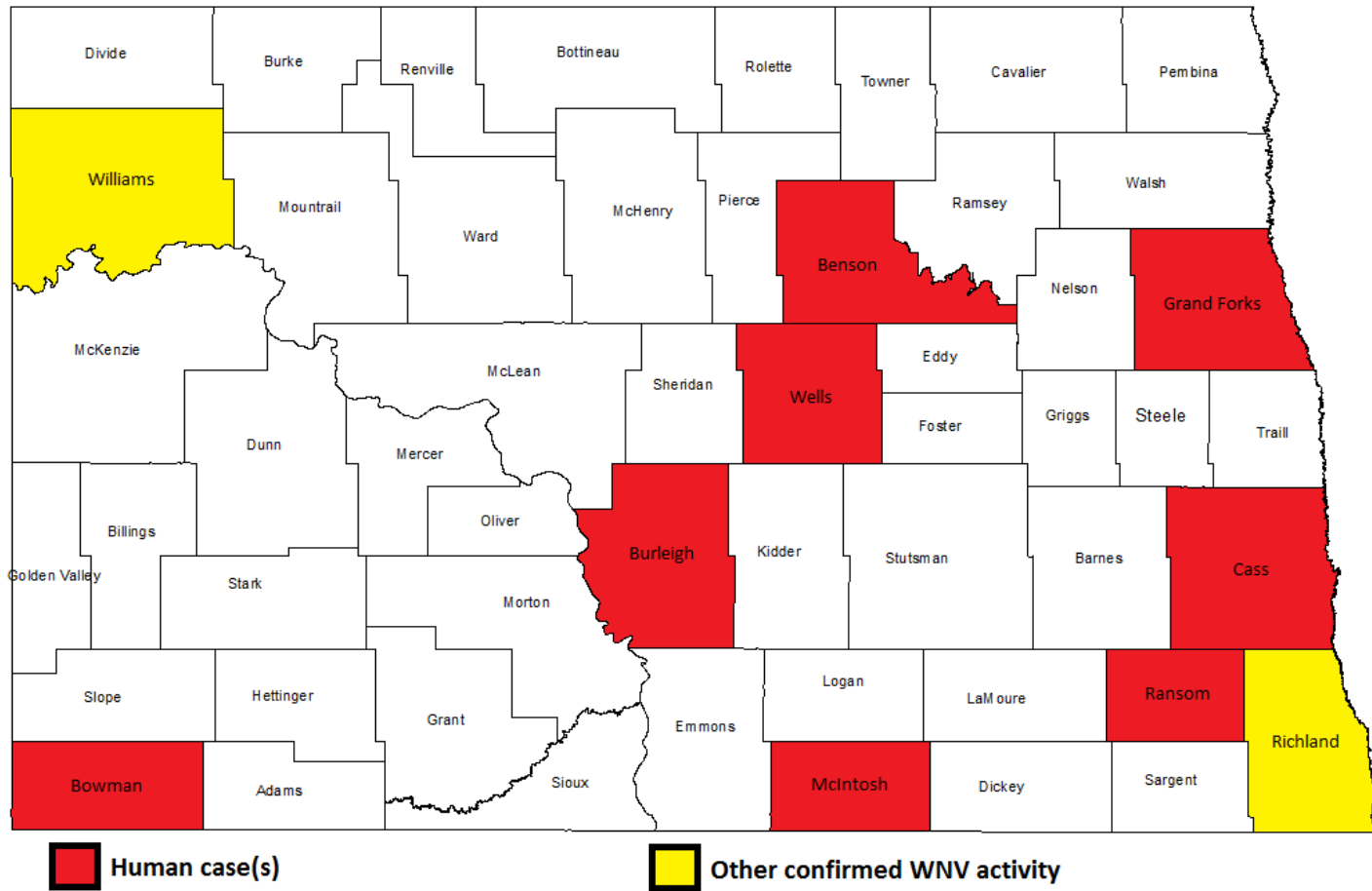
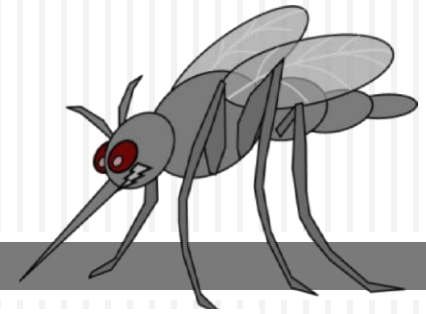
**“I outran the lion, jumped over the alligators, and scared away the gorilla. Then the mosquito bit me.”**

# W – West Nile Virus

2016 WNV Human Summary			
Total Cases		Age Information	
As of 08/12/2016		Range	Cases
Gender		<10	0
Female	7	10-19	0
Male	8	20-29	1
		30-39	3
Hospitalized	2	40-49	2
		50-59	3
Active Counties	8	60 and over	6

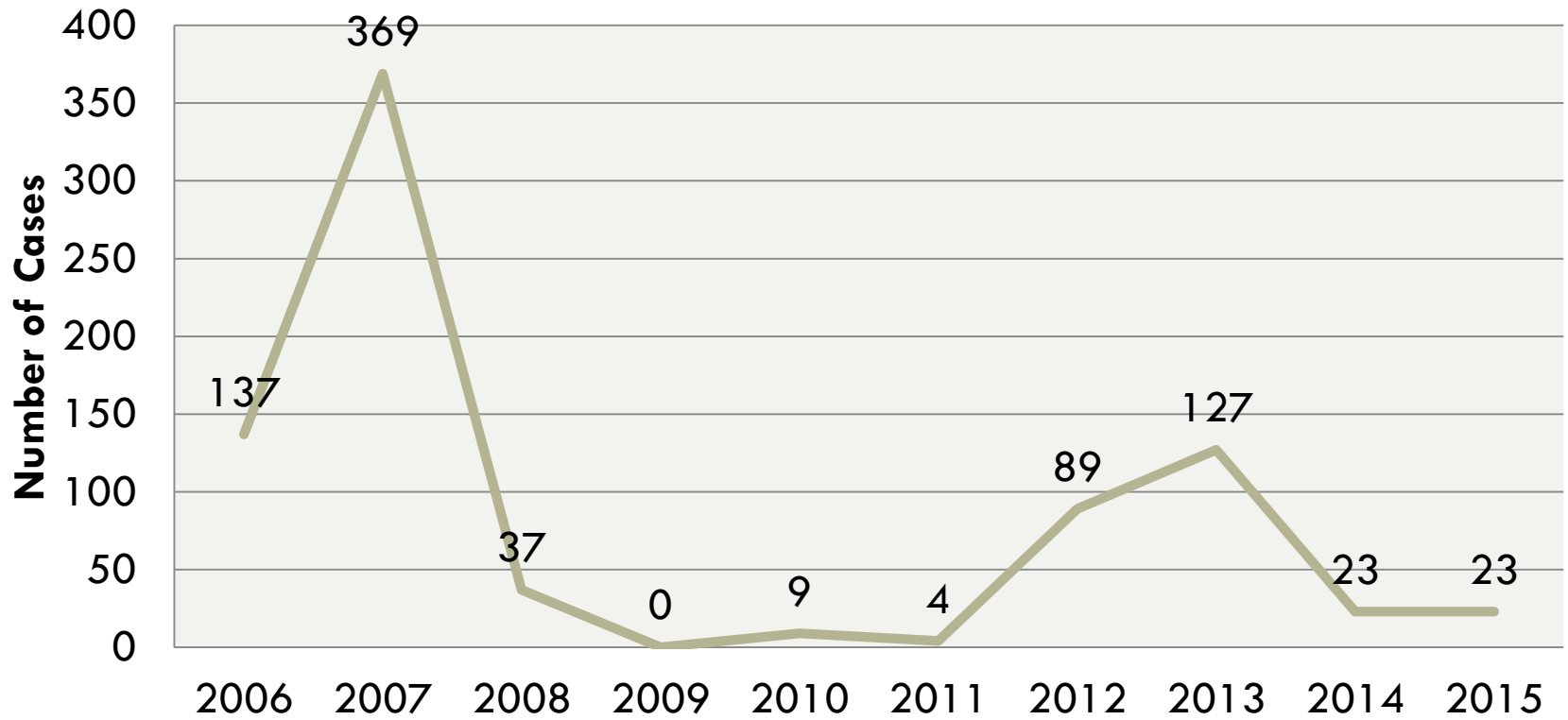
- West Nile virus (WNV) is an arthropod-borne virus (arbovirus) most commonly spread by infected mosquitoes.
- WNV is maintained in a transmission cycle involving one or more species of mosquitoes and birds.
- WNV is transmitted to people, horses and other domestic animals through the bite of a mosquito infected with West Nile virus.
- In North Dakota, *Culex tarsalis* is the most important vector in transmitting WNV to humans.
- West Nile virus can cause febrile illness, encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord).

# W – West Nile Virus



# W – West Nile Virus

**North Dakota West Nile Virus Case Counts by Year, 2006-2015**



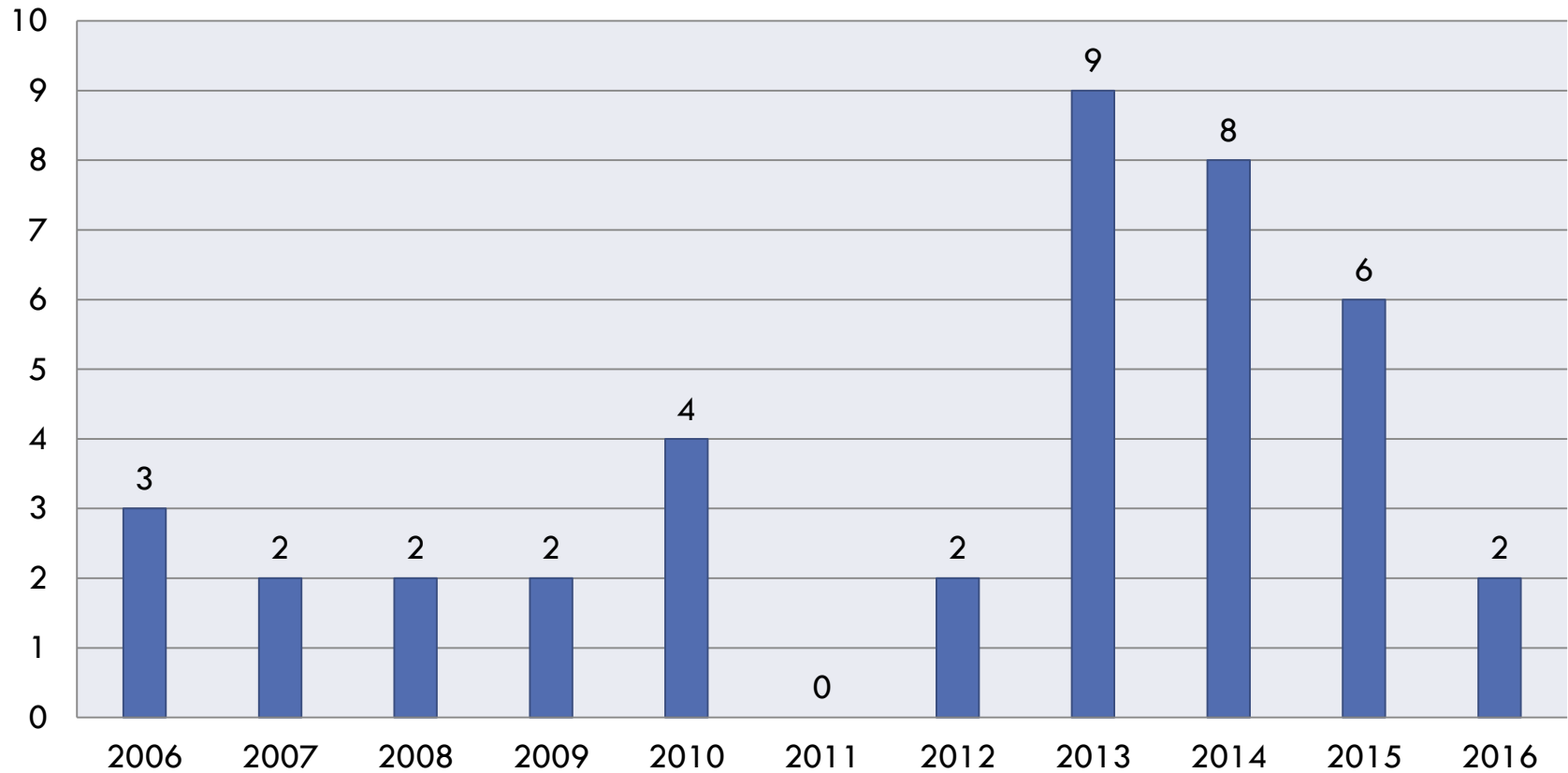


# X – Xanthic (Yellowish)

- Hepatitis A: acute infection of the liver
  - ▣ Found in the stool (feces) of infected people
  - ▣ Hepatitis A is usually spread when the virus is taken in by mouth from contact with objects, food, or drinks contaminated by the feces of an infected person.
- Hepatitis B and C: can lead to lifelong (chronic) infection and can cause serious liver damage (cirrhosis or liver cancer) and death
  - ▣ Hepatitis B virus can be found in the blood serum, semen, vaginal secretions, amniotic fluids and other body fluids of an infected person. Human milk and saliva are minimally infectious.
  - ▣ Hepatitis C virus is spread primarily through large or repeated percutaneous (i.e. passage through the skin) exposures to infectious blood.

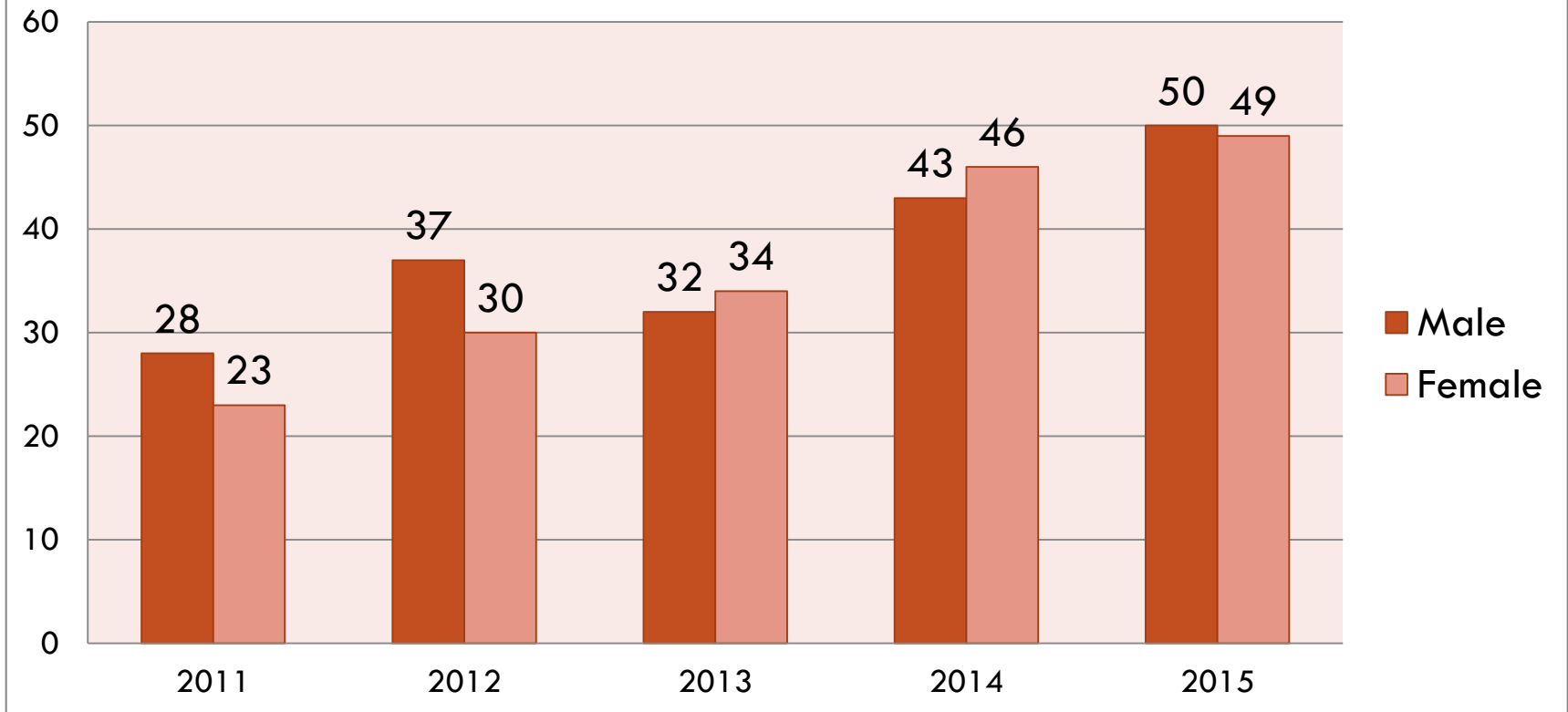
# X – Xanthic

## Confirmed Hepatitis A Cases in ND 2006-2016

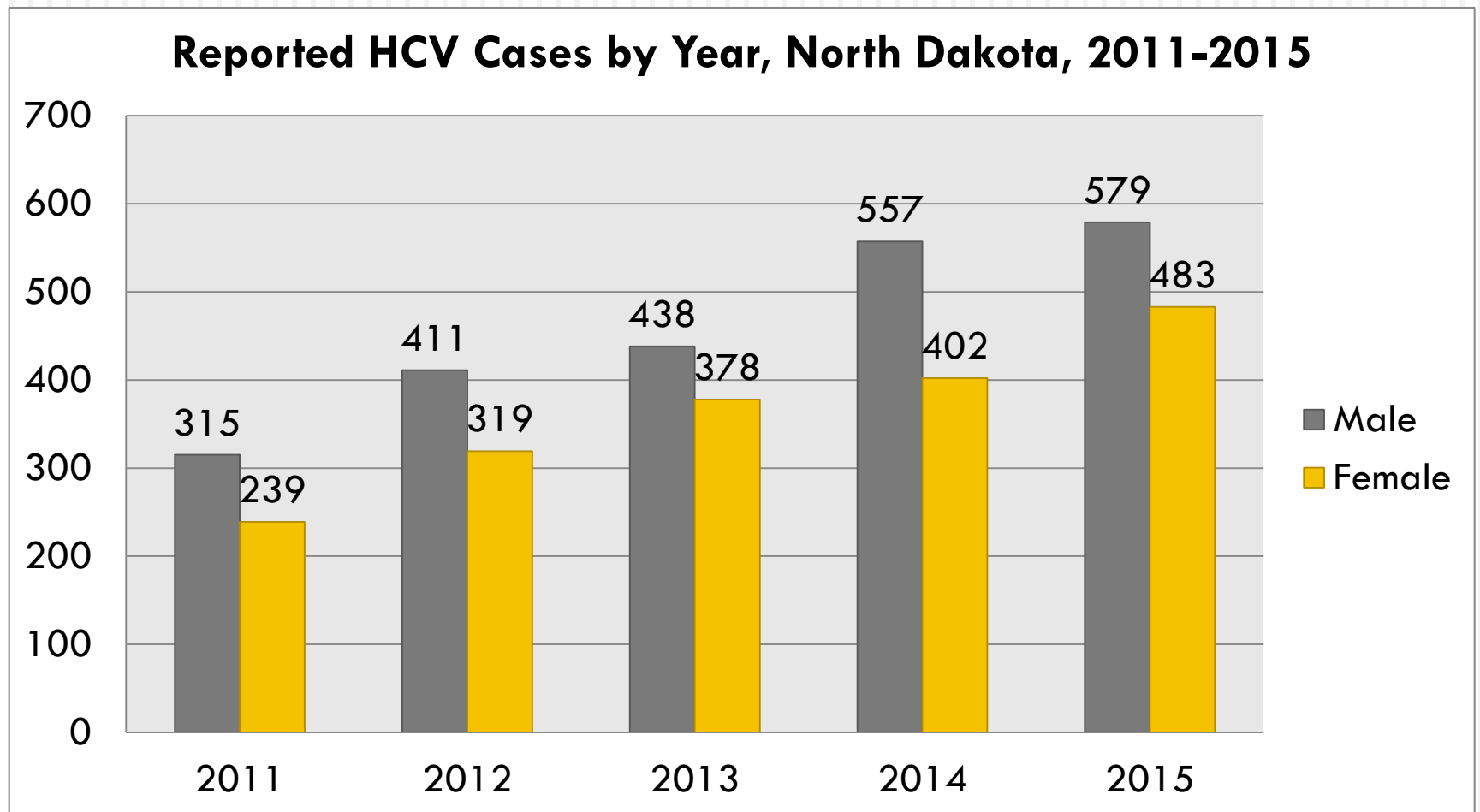


# X – Xanthic

**Reported Chronic HBV Cases by Year, North Dakota, 2011-2015**



# X – Xanthic



# Y – Yawn

- I couldn't think of a good "Y" disease, other than yellow fever. You are all probably starting to yawn from my long presentation, so I'll move on to Zika and be done!



# Z – Zika Virus

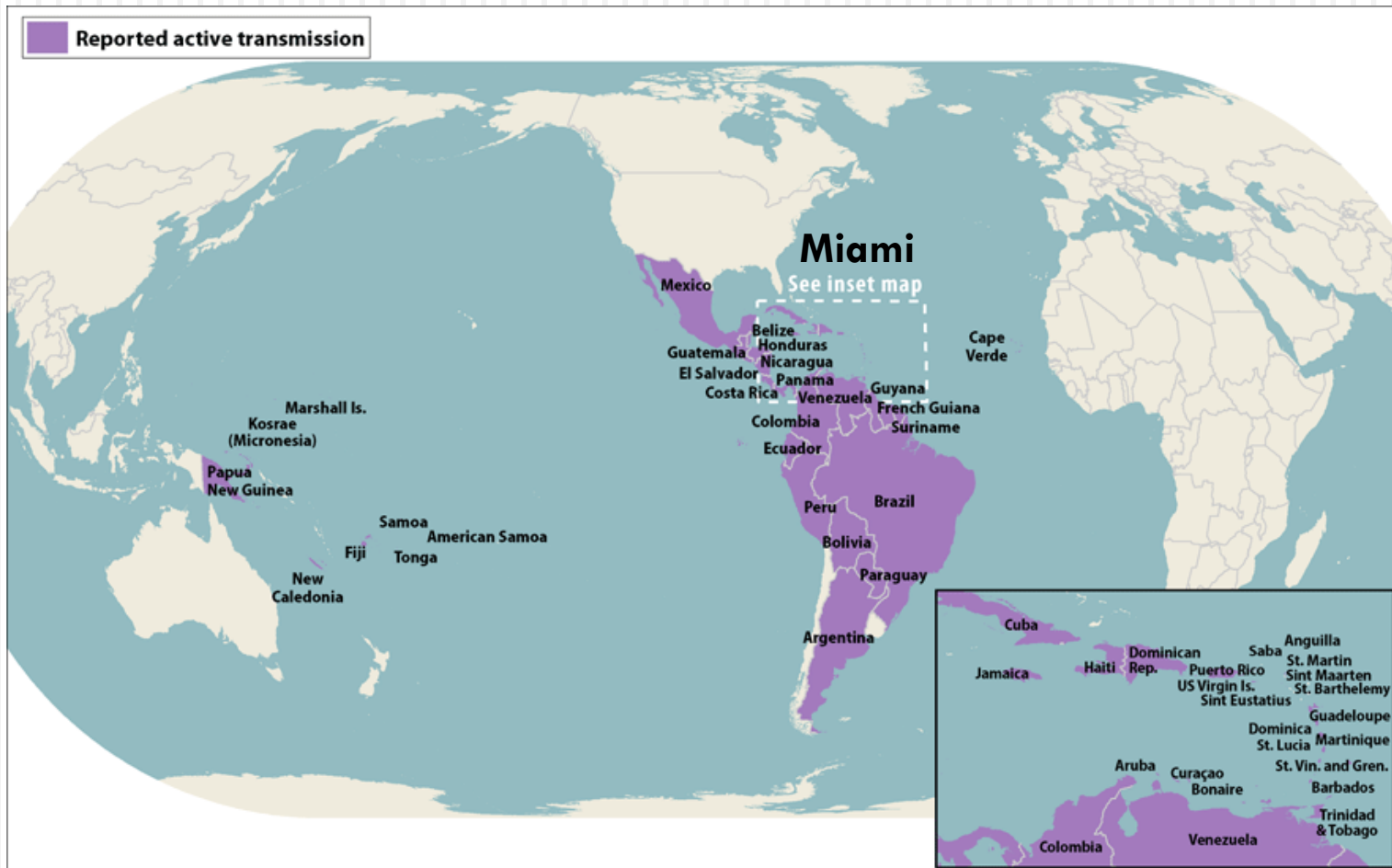
- Zika is a virus that is primarily spread through the bite of an infected *Aedes* species mosquito.
- Zika virus can cause a mild illness known as Zika virus disease.
- If a pregnant woman is infected with Zika virus, her baby may be born with severe birth defects as a result of the infection.
  - ▣ A commonly reported birth defect is microcephaly, where a baby is born with an abnormally small head and has likely brain damage as a result.



# Z – Zika Virus

- As of 07/28/2016, there have been **2** Zika virus disease cases identified in North Dakota.
- As of 07/28/2016, there was **1** asymptomatic Zika virus infection identified in North Dakota.
- <http://www.ndhealth.gov/disease/zika/>
- As of August 19, 33 cases of Zika infection likely resulting from local transmission have been reported to the Florida Department of Health.
- Pregnant women and couples planning to become pregnant should avoid Zika areas.

# Z – Zika Virus





# Z – Zika Virus



Questions?