

Completing Invasive *Streptococcus pneumoniae* Case Investigations

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ISDH Vaccine-Preventable Disease Epidemiologist

According to the Indiana Communicable Disease Rule (410 IAC 1-2.3-99), local health department (LHD) staff are responsible for the investigation of invasive *Streptococcus pneumoniae* cases in individuals aged 6 years and older. (Indiana State Department of Health [ISDH] Field Epidemiologists investigate invasive *S. pneumoniae* cases in those under age 6.) Investigations must be initiated within 72 hours of notification of the case and must include:

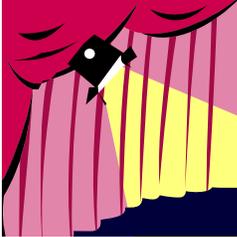
- Complete pneumococcal vaccine immunization history. Please avoid submitting an “unknown” pneumococcal vaccine history, as previous pneumococcal vaccination in a *S. pneumoniae* case can indicate vaccine failure.
- History of chronic underlying disease, asplenia, or immunosuppression.
- Drug-resistance patterns. Please do not leave the drug-resistance pattern blank. If sensitivity testing was not done, attempt to indicate why. Completing this section can aid in detecting increases or decreases in drug-resistance rates.
- If available, please attach any supporting documents to the completed case investigation form. Supporting documents may include the lab report demonstrating culture of *S. pneumoniae*, history and progress notes, discharge summary, and/or death summary.

LHDs may be notified of invasive *S. pneumoniae* cases through several sources, including health care providers, infection control practitioners, laboratories, or the ISDH. Case investigations are not completed when *S. pneumoniae* is isolated from a non-sterile site (eye, wound, sputum, urine). Case investigations should be completed when *S. pneumoniae* is isolated from a typically sterile site, including blood, cerebral spinal fluid, peritoneal fluid, pericardial fluid, joint fluid, or fluid collected through tympanocentesis.

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The *Streptococcus Pneumoniae* Case Investigation Form is available at <http://www.in.gov/isdh/files/49218-Streptococcus.pdf>.

Local health departments should fax completed investigation forms to the ISDH Epidemiology Resource Center at 317.234.2812 within 30 days of case notification.



OUTBREAK SPOTLIGHT....

Outbreak Spotlight is a regularly occurring feature in the Indiana Epidemiology Newsletter to illustrate the importance of various aspects of an outbreak investigation.

Outbreak of Viral Gastroenteritis Among Attendees of Two Recreational Vehicle Trade Shows

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Background

On March 14, 2008, the Indiana State Department of Health (ISDH) and the St. Joseph County Health Department (SJCHD) were notified of a gastroenteritis outbreak at two recreational vehicle trade shows. Over 238 individuals from 30 states, Puerto Rico, and 5 providences in Canada attended the shows. Eleven different meals were prepared and served at two adjoining facilities (one meal was served at an off-site location). In addition, the attendees consumed meals at various other restaurants, and the two groups arrived on different dates. Symptoms reported included vomiting and diarrhea.

Epidemiologic Investigation

The SJCHD and the ISDH initiated a collaborative investigation and conducted two cohort studies. A complete list of attendees and their contact information was obtained from the organizers of the two trade shows. The menus for the meals served were obtained from the two adjoining facilities. Notification and subsequent updates were sent to all involved states via CDC's Epi-X system and the National Foodborne Outbreak Listserv. The ISDH contacted public health officials in Puerto Rico and Canada via telephone.

Table 1: Trade Show One Meal Service and Dates

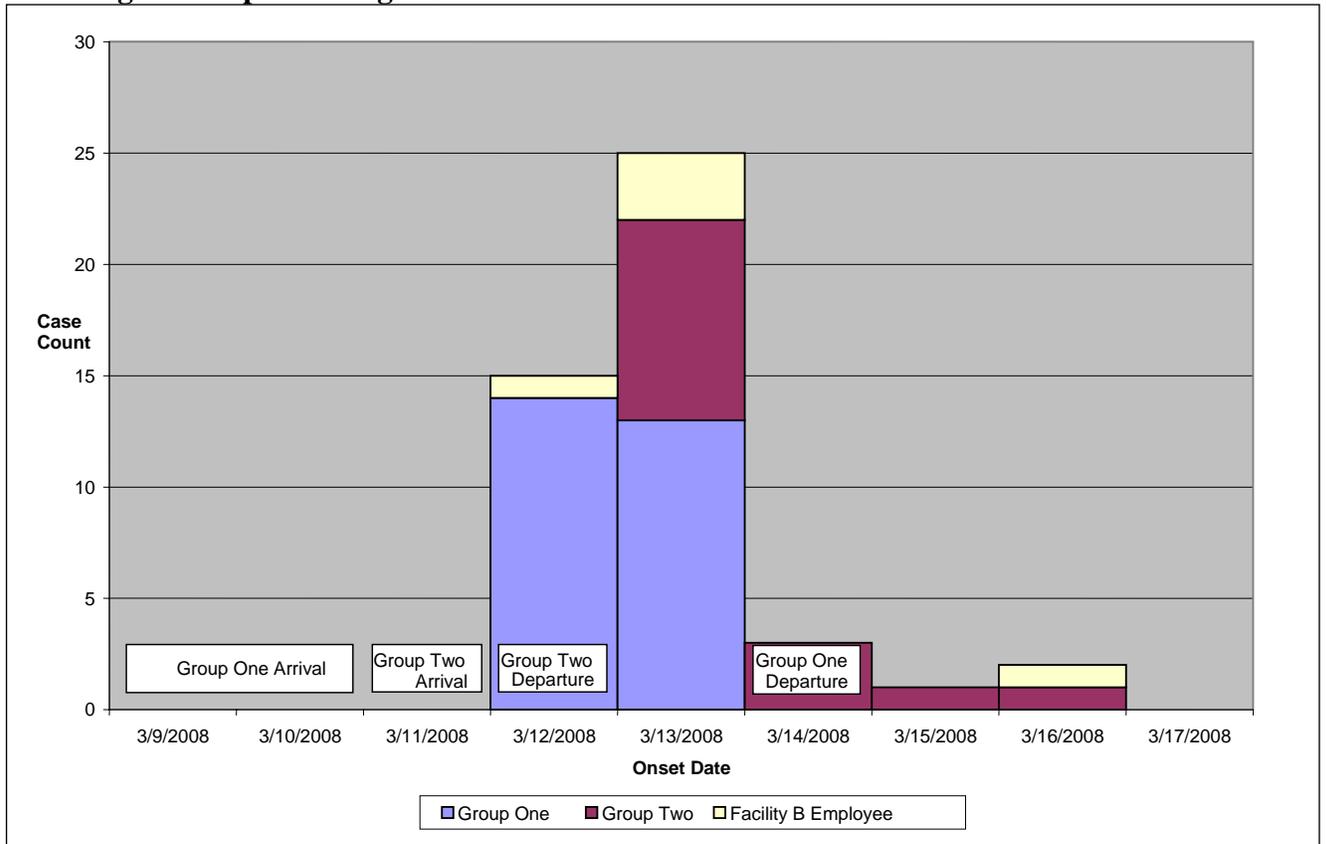
	March 9	March 10	March 11	March 12	March 13
Facility A	Dinner	Dinner	Dinner	Dinner	0
Facility B	0	Lunch	Lunch	Lunch	Lunch

Table 2: Trade Show Two Meal Service and Dates

	March 11	March 12
Facility A	0	0
Facility B	Lunch and Dinner	Lunch (off site)

Questionnaires were developed to determine illness onset, symptom history, and food consumption. Public health officials in Indiana, multiple states, Canada, and Puerto Rico conducted 119 case interviews. A case was defined as any previously healthy person who attended either trade show from March 9-14, 2008, or who was a contact of a trade show attendee and developed diarrhea or vomiting after March 9. The illness onset dates ranged from March 12-16 (Figure 1). The attack rate for Trade Show One was 12.5 percent, and the attack rate for Trade Show Two was 65.0 percent. Predominant symptoms included diarrhea (92.5%) and vomiting (77.5%). Twelve cases consulted health care providers, and one case was hospitalized. Forty-six individuals met the case definition. Secondary cases were noted during the investigation.

Figure 1: Epidemiologic Curve and Arrival Dates for Both Trade Shows

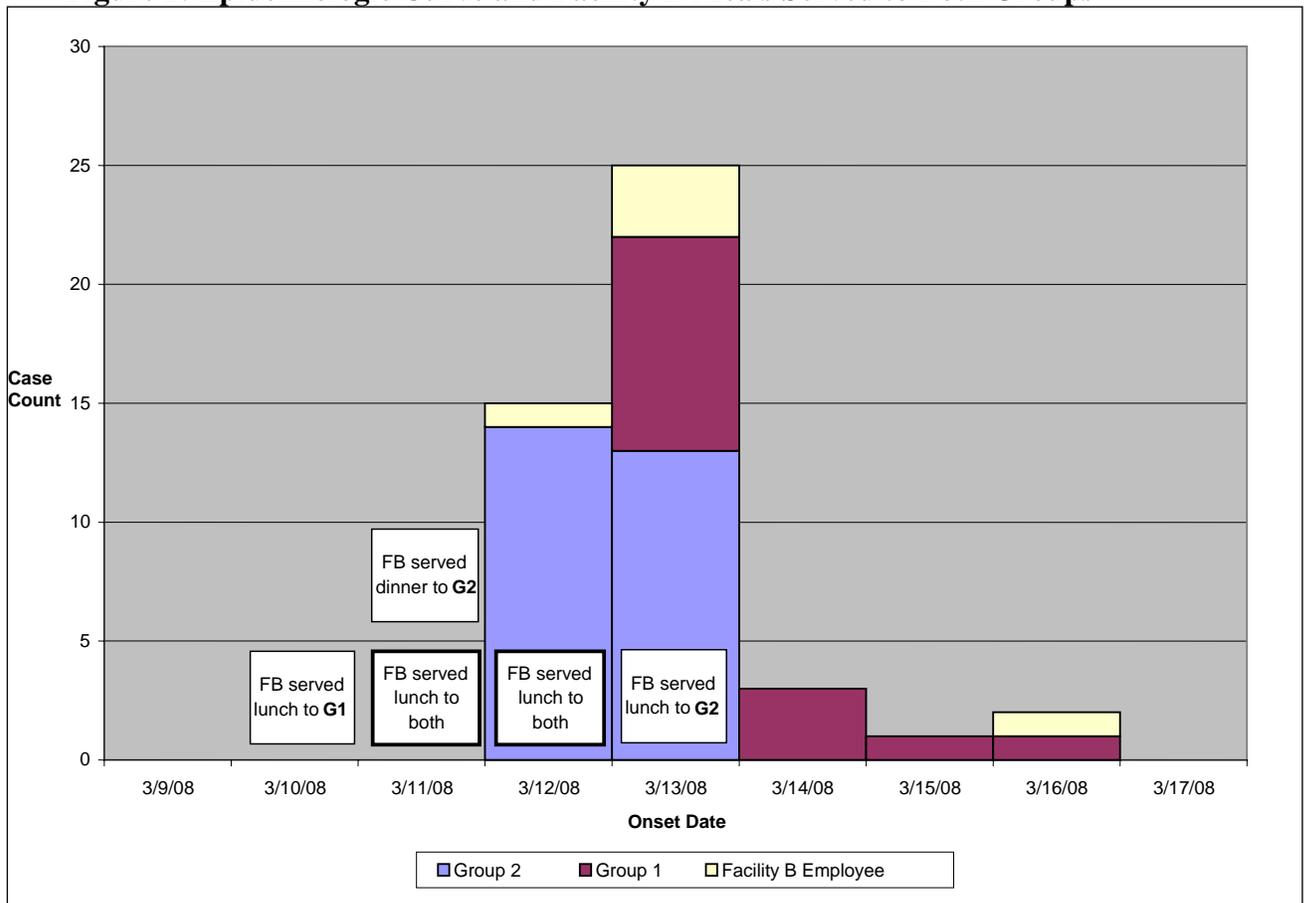


The following events were analyzed to evaluate the significance of association between illness and specific trade show events: 1) contact with ill people, 2) eating at other restaurants, and 3) eating any of the 11 trade show meals. Only two events, both associated with Trade Show One, were found to be statistically significant. Table 3 shows the p-values for the meals and all trade show attendees.

Table 3: Significant Events

	Adjusted Risk Ratio (95% CI)	P-Value
March 12 Lunch	17.57 (1.19 – 260.00)	0.037
March 12 Dinner	12.05 (1.98 – 73.19)	0.007

Figure 2: Epidemiologic Curve and Facility B Meals Served to Both Groups



Environmental Assessment

The SJCHD Food Protection Division inspected the two facilities where food was prepared and served. The inspection revealed that potatoes were not being properly washed prior to utilizing for potato soup in Facility B. The potato soup was served to both groups on separate days and had been cooled in one large container rather than separated into shallow pans as per food regulations. Although five employees from the facility were reported ill, none of the five was a food handler.

The SJCHD did not inspect Facility A because no ill employees were identified, and only participants from Trade Show One had consumed meals there.

Laboratory Results

The ISDH and SJCHD collected three stool samples and submitted them to the ISDH Laboratory for analysis. All three samples tested positive for *Norovirus*. The Arizona State Health Department and the City of Houston Health Department each reported one positive *Norovirus* specimen. The five positive *Norovirus* results included three attendees

from Trade Show One, one attendee from Trade Show Two, and one employee from Facility B. Given the positive *Norovirus* results, no bacterial testing was performed.

Conclusions

The investigation confirmed that an outbreak of *Norovirus* did occur during the recreational vehicle trade shows. Illness was not identified in any other groups. The epidemiologic curve illustrates that the outbreak began during Trade Show Two, one day after participants arrived and within the typical incubation period for *Norovirus*, and included at least one Facility B employee (Figure 1). Both groups were provided lunch at Facility B on March 11-12, allowing for person-to-person and fomite transmission among the attendees and possible transmission by Facility B employees (Figure 2). The employees and attendees also shared the same restroom facilities.

No events were found to be statistically significant for Trade Show Two. There were two events statistically associated with illness during Trade Show One (Table 3). Those from Trade Show One who attended the lunch at Facility B on March 12 were more likely to become ill than those who did not attend (Table 3). This was the second meal that was served in Facility Two for the two groups (Figure 2). Those from Trade Show One who attended the dinner at Facility A on March 12 were more likely to become ill than those who did not attend (Table 3). This event took place during the first illness onset during Trade Show One and contributed to transmission by person-to-person contact (Figure 2).

No food items were significant in the analysis. The findings from the food inspection warranted corrective actions, but they were not contributing factors to the outbreak.

Viral gastroenteritis is passed in the stool or vomit of infected people (fecal-oral route). The virus is easily spread by contaminated food or beverages, from person to person, and by contact with a contaminated object. These viruses can remain infectious on surfaces for up to 72 hours, and only a very small amount of virus is needed to cause infection.

Symptoms include watery diarrhea, vomiting, nausea, cramps, headache, muscle aches, and tiredness. Symptoms usually begin 24-48 hours (range: 12-72 hours) after exposure and last 24-48 hours. The illness can last 72-84 hours in the elderly or in those with weakened immune systems. Most cases have no, or slight, fever. Infected people can shed the virus for as long as two weeks after recovery.

Recommendations

In general, most *Norovirus* outbreaks can be prevented by strictly adhering to the following guidelines:

- Practice good hygiene:
 - Thoroughly wash hands with soap and water after using the restroom; after changing diapers; after assisting someone with diarrhea and/or vomiting; after swimming; and before, during, and after food preparation.
 - Clean food preparation work surfaces, equipment, and utensils with soap and water before, during, and after food preparation.

- Eat safe foods and drink safe water (Remember: Contaminated foods may look and smell normal.):
 - Wash all produce before eating raw or cooking.
 - Use treated water for washing, cooking, and drinking.
- Protect others:
 - Persons with diarrhea and/or vomiting should not prepare food or provide health care for others and should limit direct contact with others as much as possible.
 - Persons with diarrhea and/or vomiting should not attend a child-care facility or school.
 - Persons with diarrhea and/or vomiting shall be excluded from employment involving food handling.
 - Do not change diapers near recreational water.
 - Do not go swimming or use hot tubs if you have diarrhea and for at least two weeks after diarrhea stops.

Reference

1. **ISDH November 13, 2004. Retail Food Establishments Sanitation Requirements. Title 410 IAC 7-24-122**
<http://www.in.gov/isdh/21367.htm>
2. **Norovirus Fact Sheet, Centers for Disease Control and Prevention,**
www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm
3. **Quick Facts about Handwashing, Indiana State Department of Health,**
<http://www.in.gov/isdh/21085.htm>



Descriptive Epi

Descriptive Epi is a new feature in the Indiana Epidemiology Newsletter to highlight epidemiologists and those practicing epidemiology in Indiana. If you are aware of anyone deserving recognition, please contact the Epi newsletter staff at epinewsletter@isdh.IN.gov

Name: Mona Wenger

Position: District 2 Field
Epidemiologist

Education: Master of Science in
Community Health

How did you get started in Public Health?

I have always been interested in the medical field and having a family. I came from a large Italian/German family with five brothers and five sisters. I remember my dad having to work three jobs to support us.



After high school graduation, I joined the United States Navy as a hospital corpsman. I met my husband Ken while in the Navy. After leaving the service, I entered the nursing program at Ball State University. After having trouble finding suitable child care, I chose to leave nursing and remain at home to care for our three children.

I have always loved the community where I grew up. As we reared our family in my hometown, Ken and I watched the community physically deteriorate (e.g., empty buildings with broken windows). Decreasing job opportunities, alcohol and drug abuse, teen pregnancy, and labeling of people based on where they lived became real problems. There is an objective that I utilize often in public health: a community is not healthy unless every individual in the community is healthy (*Healthy People, 2010*).

Ken died unexpectedly 14 years later at age 41 from a heart attack after outpatient knee surgery. Faced with the need to provide for our family, I returned to school. I had been out of the nursing field too long to utilize my credits, so I graduated with a Bachelor of General Studies degree.

My desire to help my family and friends drew me into the field of Community Health. I was accepted for an internship in the Health Science Department at Ball State University while earning a Masters of Science Degree in Community Health Education. My

internship included working with the HIV/STD Program at the Indiana State Department of Health (ISDH). I enjoyed working in public health but, unfortunately, my community had no monetary resources to hire me as a health educator. I accepted a position with the ISDH Perinatal Hepatitis B Program and moved to St. Joseph County.

The ISDH District 2 Field Epidemiologist position then became available. This position has provided me the opportunity to put into practice all I have learned in the nursing and health education fields. I also try to utilize the knowledge I have acquired to assist my hometown community in public health issues.

What is the most rewarding part of your job?

Knowing that my job creates a positive health outcome for the population I serve.

What is a typical day like for you?

The day often begins with general work issues, such as requests for guidance on public health issues from the District 2 local health departments and hospitals and research requests on communicable diseases. Usually the week does not end without being notified of a possible foodborne illness, vaccine preventable disease, or other communicable disease event.

What is your ideal vacation?

I love hanging out with my family and friends at any location WITHOUT my Blackberry.

What is your favorite hobby?

Reading.



Training Room

INDIANA STATE DEPARTMENT OF HEALTH IMMUNIZATION PROGRAM PRESENTS:

Immunizations from A to Z

Immunization Health Educators offer this FREE, one-day educational course that includes:

- Principles of Vaccination
- Childhood and Adolescent Vaccine-Preventable Diseases
- Adult Immunizations
 - Pandemic Influenza
- General Recommendations on Immunization
 - Timing and Spacing
 - Indiana Immunization Requirements
 - Administration Recommendations
 - Contraindications and Precautions to Vaccination
- Safe and Effective Vaccine Administration
- Vaccine Storage and Handling
- Vaccine Misconceptions
- Reliable Resources

This course is designed for all immunization providers and staff. Training manual, materials, and certificate of attendance are provided to all attendees. Please see the Training Calendar for presentations throughout Indiana. Registration is required. To attend, schedule/host a course in your area or for more information, please reference

<http://www.IN.gov/isdh/programs/immunization.htm>.

ISDH Data Reports Available

The following data reports and the *Indiana Epidemiology Newsletter* are available on the ISDH Web Page:

http://www.IN.gov/isdh/dataandstats/data_and_statistics.htm

HIV/STD Quarterly Reports (1998-June 2006)	Indiana Mortality Report (1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006)
Indiana Cancer Incidence Report (1990, 1995, 1996, 1997, 1998)	Indiana Infant Mortality Report (1999, 2002, 1990-2003)
Indiana Cancer Mortality Report (1990-1994, 1992-1996)	Indiana Natality Report (1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006)
Combined Cancer Mortality and Incidence in Indiana Report (1999, 2000, 2001, 2002, 2003, 2004)	Indiana Induced Termination of Pregnancy Report (1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005)
Indiana Health Behavior Risk Factors (1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006)	Indiana Marriage Report (1995, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004)
Indiana Health Behavior Risk Factors (BRFSS) Newsletter (9/2003, 10/2003, 6/2004, 9/2004, 4/2005, 7/2005, 12/2005, 1/2006, 8/2006, 10/2006, 5/2007, 12/2007)	Indiana Infectious Disease Report (1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005)
Indiana Hospital Consumer Guide (1996)	Indiana Maternal & Child Health Outcomes & Performance Measures (1990-1999, 1991-2000, 1992-2001, 1993-2002, 1994-2003, 1995-2004, 1996-2005)
Public Hospital Discharge Data (1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006)	Assessment of Statewide Health Needs – 2007

HIV Disease Summary

Information as of June 30, 2008 (based on 2000 population of 6,080,485)

HIV - without AIDS to date:

363	New HIV cases from July 2007 thru June 30, 2008	12-month incidence	6.31 cases/100,000
3,812	Total HIV-positive, alive and without AIDS on June 30, 2008	Point prevalence	66.27 cases/100,000

AIDS cases to date:

382	New AIDS cases from July 2007 thru June 30, 2008	12-month incidence	6.64 cases/100,000
4,089	Total AIDS cases, alive on June 30, 2008	Point prevalence	71.09 cases/100,000
8,678	Total AIDS cases, cumulative (alive and dead) on June 30, 2008		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in June <i>MMWR</i> Weeks 23-26		Cumulative Cases Reported January – June <i>MMWR</i> Weeks 1-26	
	2007	2008	2007	2008
	Aseptic Meningitis	16	8	82
Campylobacteriosis	60	60	188	220
Chlamydia	1,789	1,401	10,757	10,336
Cryptococcus	1	2	12	13
Cryptosporidiosis	8	10	26	69
<i>E. coli</i> , shiga toxin-producing	6	6	17	15
<i>Haemophilus influenzae</i> , invasive	11	5	31	45
Hemolytic Uremic Syndrome (HUS)	0	0	0	0
Hepatitis A	0	1	4	8
Hepatitis B	5	6	20	19
Histoplasmosis	13	4	51	36
Influenza Deaths (all ages)	Not Reportable	0	Not Reportable	15
Gonorrhea	885	552	4,474	4,189
Legionellosis	5	6	15	18
Listeriosis	0	0	6	2
Lyme Disease	5	4	13	6
Measles	0	0	0	0
Meningococcal, invasive	0	2	13	16
Mumps	1	0	1	0
Pertussis	12	2	26	22
Rocky Mountain Spotted Fever	2	0	3	0
Salmonellosis	60	49	245	186
Shigellosis	6	29	29	365

REPORTED CASES of selected notifiable diseases (cont.)

Disease	Cases Reported in June MMWR Weeks 23-26		Cumulative Cases Reported January – June MMWR Weeks 1-26	
	2007	2008	2007	2008
Group A Streptococcus, invasive	8	9	69	87
Group B Streptococcus, Newborn	4	0	15	13
Group B, Streptococcus, invasive	12	22	101	138
<i>Streptococcus pneumoniae</i> (invasive, all ages)	63	49	349	530
<i>Streptococcus pneumoniae</i> (invasive, drug resistant)	20	15	106	148
<i>Streptococcus pneumoniae</i> (invasive, <5 years of age)	7	2	23	39
Syphilis (Primary and Secondary)	4	6	21	68
Tuberculosis	6	7	66	57
Yersiniosis	1	0	6	5
Animal Rabies	1 (bat)	0	6 (bats)	1 (bat)

For information on reporting of communicable diseases in Indiana, call the *Surveillance and Investigation Division* at 317.233.7125.



The *Indiana Epidemiology Newsletter* is published monthly by the Indiana State Department of Health to provide epidemiologic information to Indiana health care professionals, public health officials, and communities.

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