Too Many Infants are Dying: What You Should Know

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In 2011, 643 Indiana infants died before their first birthday from a variety of underlying causes such as birth defects, prematurity, low birth weight, and suffocation. Indiana's infant mortality rate increased from 7.5 in 2010 to 7.7 per 1,000 live births, though the difference was not statistically significant. Indiana's rate is significantly higher than the United States rate of 6.1 as well as the Healthy People 2020 goal of 6.0 per 1,000 live births.

The Infant Mortality Rate (IMR) is defined as the death of an infant before his/her first birthday and is expressed as a rate of the number of infant deaths for every 1,000 live births. Infant mortality is the leading indicator of health status in the world. Although much has been done to address Indiana's high infant mortality rate over the years, Indiana's rate has been under 7.0 only one time in the last 113 years, 6.9 in 2008.

Significant disparities exist in the African American population regarding infant mortality. Although Indiana's African American infant mortality rate was at an all-time low of 12.3 per 1,000 live births in 2011, the rate is still 1.8 times the white infant mortality rate of 6.9. Also in 2011, there was a significantly higher percentage of African American infants born preterm (less than 37 weeks gestation) than white infants (14.0% vs. 9.6%, respectively) and with a low birth weight (less than 2,500 grams) (13.3% vs. 7.3%, respectively).

Smoking during pregnancy is also a concern as it can contribute to a variety of medical complications for the infant, including low birthweight and premature birth which contribute significantly to infant mortality. In 2010, 17.1% of Indiana women smoked during pregnancy compared with the rate of 9.2% for the 29 states using the 2003 US Standard Certificate of Live Birth (the 2003 "revised" certificate) and the Healthy People 2020 goal of 1.4%. A significantly higher percent of Indiana white mothers than black mothers smoked during pregnancy in 2010 (18.4% vs. 13.6%, respectively). Indiana mothers ages 18-24 were the most likely to smoke during pregnancy. A higher percent of low birth weight infants were born to black mothers who smoked (16.6%) compared to white mothers who smoked (10.8%). Of those Indiana women who were Medicaid participants, 27.8% smoked during pregnancy.

The Indiana State Department of Health (ISDH) realizes that there are too many Indiana infants dying and there is much that can be done to address this issue. Therefore, reducing our infant mortality rate has been declared the number one priority of the ISDH for 2013. The Maternal and Child Health Division met as a team and began constructing an infant mortality plan that addresses many factors that contribute to infant mortality, including hospital obstetrical (OB)

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and neonatal intensive care unit (NICU) levels of care, birth defects, elective deliveries prior to 39 weeks gestation, suffocation and sudden infant death syndrome (SIDS), and smoking during pregnancy. Another key piece of the overall plan will be to host an Infant Mortality Summit on November 1, 2013 to increase the public's awareness of the issue of infant mortality and how they can help affect changes in individual behavior.

Information on the Summit will be posted on the Maternal and Child Health website at http://www.in.gov/isdh/19571.htm.

Much has been done to address Indiana's high infant mortality rate over the years, but we believe we currently have everything in place to truly make a difference in saving the lives of our youngest Hoosiers.

Sources: Indiana State Department of Health, Maternal & Child Epidemiology Division [February 21, 2013]
United States Original Data: Centers for Disease Control and Prevention National Center for Health Statistics
Indiana Original Data: Indiana State Department of Health, Public Health and Preparedness Commission, Epidemiology Resource Center, Data Analysis Team

Fungal Infections Associated with Contaminated Steroid Injections

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Background

In September 2012, the largest healthcare associated infection (HAI) outbreak in public health history occurred. Following initial reports from the Tennessee Department of Health, The Centers for Disease Control and Prevention (CDC) informed the Indiana State Department of Health (ISDH) of six facilities receiving potentially contaminated methylprednisolone acetate produced at the New England Compounding Center (NECC).[1] Indiana identified 1,502 patients exposed to this product.

Epidemiologic Investigation

Initial Response

The ISDH formed a response team that included the Chief Medical Officer, State Epidemiologist, Director of Acute Care and Director and staff from Surveillance and Investigation Division (SID). Initial steps included notification of the six Indiana clinics that received contaminated product, requests for patient information from clinics using standardized forms, collaboration with infectious disease specialists and infection preventionists regarding case identification, and collaboration with CDC on daily conference calls and data submission regarding case counts or cases under investigation. The SID also requested a CDC Epi-Aid team of two individuals deployed to northern Indiana to extract additional data for CDC. The ISDH created several Indiana Health Alert Network advisories and press releases informing health care providers and the public of the outbreak and various recommendations and presented a live webinar for health care providers addressing the status of the outbreak.

The initial Indiana cases were reported as fungal meningitis. As the outbreak unfolded, cases developed fungal infections at the site of injection. The CDC updated the case definition to include these new infections.

The current case definition is as follows:

CDC Case Definitions for Fungal Meningitis and Other Infections:[2]

Probable Case

A person who received a preservative-free methylprednisolone acetate (MPA) injection, **with preservative-free MPA that definitely or likely came from one of the following three lots produced by the New England Compounding Center (NECC) [05212012@68, 06292012@26, 08102012@51]**, and subsequently developed any of the following:

Meningitis[1] of unknown etiology following epidural or paraspinal injection[2] after May 21, 2012;

Posterior circulation stroke without a cardioembolic source and without documentation of a normal cerebrospinal fluid (CSF) profile, following epidural or paraspinal injection[2] after May 21, 2012;[3]

Osteomyelitis, abscess or other infection (e.g., soft tissue infection) of unknown etiology, in the spinal or paraspinal structures at or near the site of injection following epidural or paraspinal injection2 after May 21, 2012; or

Osteomyelitis or worsening inflammatory arthritis of a peripheral joint (e.g., knee, shoulder, or ankle) of unknown etiology diagnosed following joint injection after May 21, 2012.

[1] Clinically diagnosed meningitis with one or more of the following symptoms: headache, fever, stiff neck, or photophobia, in addition to a CSF profile showing pleocytosis (>5 white blood cells, adjusting for presence of red blood cells by subtracting 1 white blood cell for every 500 red blood cells present) regardless of glucose or protein levels.

[2] Paraspinal injections include, but are not limited to, spinal facet joint injection, sacroiliac joint injection, or spinal or paraspinal nerve root/ganglion block.

[3] Patients in this category who do not have any documented CSF results should have a lumbar puncture performed if possible, using a different site than was used for the epidural injection when possible.

Confirmed Case

A probable case with evidence (by culture, histopathology, or molecular assay) of a fungal pathogen associated with the clinical syndrome.

Ongoing Investigation

The Chief Medical Officer and SID staff continued to collect information on cases andpatients under investigation and transmit case data to the CDC. The team arranged conference calls with each clinic involved to provide updates and an opportunity to ask questions. Private conference calls with CDC fungal expert Dr. Tom Chiller were arranged if requested. The team also provided data through the *ISDH Weekly Digest* and multiple presentations, including the Association for Professionals in Infection Control and Prevention Indiana (APIC-IN) Conference. New case counts are reported monthly on CDC conference calls, and next steps in case investigation are discussed.

As of 6/10/13, Indiana has reported 88 cases and 11 deaths from this outbreak. These numbers rank third in the United States with number of cases behind Michigan and Tennessee. Figure 1 depicts the number of counted Indiana cases by week. Figure 2 shows the number of cases by site of infection, 30 (34%) are meningitis only, 17 (19%) are meningitis and paraspinal/spinal infection, 1 (1%) was a stroke and 40 (46%) are paraspinal/spinal infections.

Figure 1

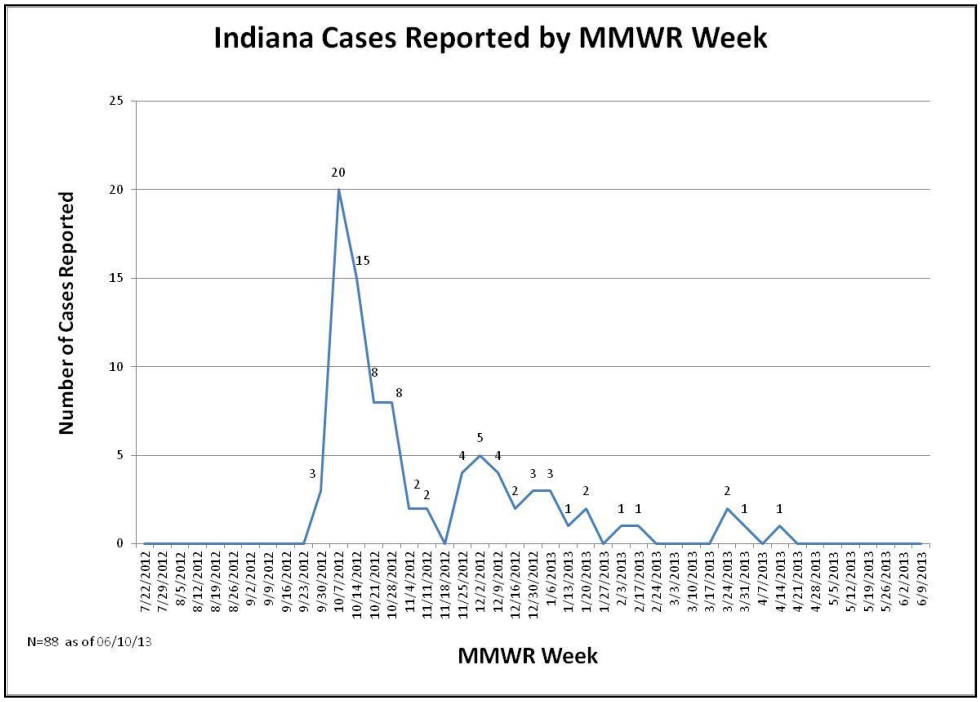
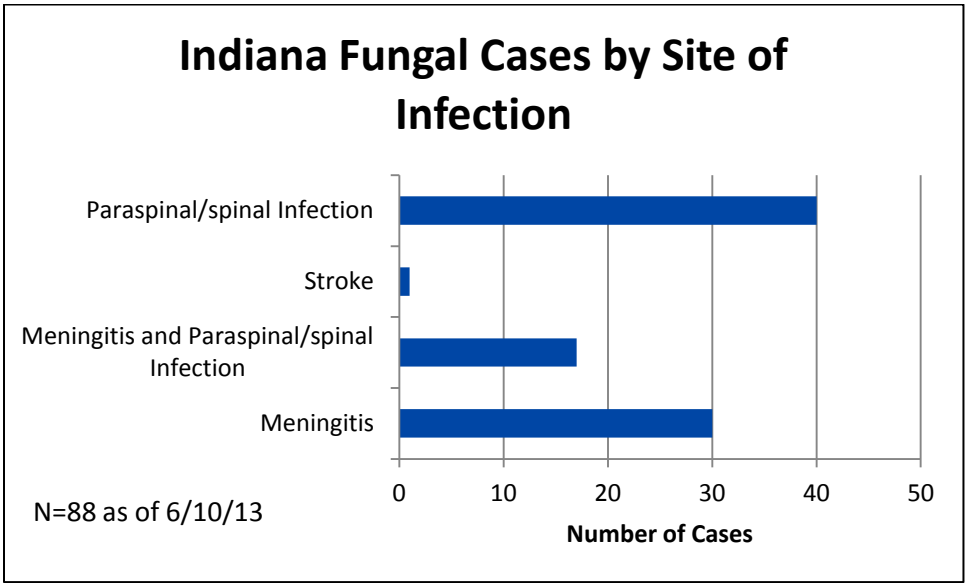


Figure 2



Nationally, as of 6/10/13, there are a total of 745 cases with 20 states involved and 58 deaths.[3] The findings from a CDC published paper "Fungal Infections Associated with Contaminated Methylprednisolone Injections – Preliminary Report"[4] describes the symptoms, state attack rates, and other characteristics of the outbreak. The public health response among federal, state, and local agencies along with health care providers was critical to indentifying cases that could of otherwise not have been diagnosed. Also published in the New England Journal of Medicine is "Relapse of Fungal Meningitis Associated with Contaminated

Methylprednisolone,"[5] which describes a relapse of fungal meningitis after four months of treatment and resolution of symptoms.

Lessons learned

Lessons learned from this outbreak have been shared with all Indiana healthcare facilities and include:

- Knowledge of pharmaceutical supplier.
- Quality improvement check regarding history of recalled products.
- Documentation of product lots used during invasive procedures.
- Rotation of stock, including refrigeration or other safe practices applicable to product.

Collaboration with other public health and private partners proved invaluable while investigating, reporting and providing data. While the number of new reported cases in Indiana has sharply decreased, new cases are still under investigation. Physicians need to remain vigilant especially with the possibility of relapse from the fungal infections.

References:

1. CDC Multistate Fungal Meningitis Outbreak Investigation – Current Situation, http://www.cdc.gov/hai/outbreaks/currentsituation/
2. CDC Multistate Fungal Meningitis Outbreak Investigation- Case Definition, http://www.cdc.gov/hai/outbreaks/clinicians/casedef_multistate_outbreak.html
3. CDC Multistate Fungal Meningitis Outbreak Investigation – Current Case Count, http://www.cdc.gov/hai/outbreaks/meningitis-map.html.
4. Fungal Infections Associated with Contaminated Methylprednisolone Injections – Preliminary Report. http://www.nejm.org/doi/full/10.1056/NEJMoa1213978
5. Relapse of Fungal Meningitis Associated with Contaminated Methylprednisolone, http://www.nejm.org/doi/full/10.1056/NEJMc1306560

State Prevalence Rankings*: BRFSS, 2012

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Data Analyst/BRFSS Coordinator

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based system of health surveys created by the Centers for Disease Control and Prevention (CDC) in 1984. The BRFSS is an annual random-digit dial telephone survey conducted through a cooperative agreement with CDC. All state health departments and the District of Columbia participate. Many health conditions are not reportable; hence, prevalence data must be obtained from another source. Estimates of select chronic conditions and risk factors of adults ages 18 years and older are obtained through the BRFSS survey.

2012 prevalence data by state was recently released by CDC, and some of the risk factors and chronic conditions are provided in the table below. Each percent has a different standard error and confidence interval and because of this, the rankings are not truly meaningful. Additional prevalence data by state can be found at http://apps.nccd.cdc.gov/brfss/.

State Prevalence Rankings*: BRFSS, 2012

State	Current Smokers		No Health Care Coverage		Obese Based on BMI		Females Ages 40+ wo/ Mammogram in Past 2 Yrs.		Diabetes		No Sigmoidoscopy/ Colonoscopy**		Adults Ages 65+ wo/ flu shot in past 12 months	
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
Alabama	23.8	9	19.1	16	33.0	5	25.7	28	12.3	3	32.2	27	38.8	30
Alaska	20.5	19	18.1	20	25.7	36	28.9	15	7.0	51	39.4	2	49.2	3
Arizona	17.1	42	19.9	13	26.0	35	30.5	13	10.6	14	37.0	13	47.7	5
Arkansas	25.0	3	25.0	3	34.5	3	33.0	6	11.3	10	38.5	6	42.8	15
California	12.6	50	21.4	10	25.0	41	22.4	39	9.8	24	34.1	22	42.1	19
Colorado	17.7	36	18.2	19	20.5	51	32.0	9	7.4	46	33.2	25	33.8	43
Connecticut	16.0	48	10.8	47	25.6	39	20.2	46	9.2	33	25.5	46	40.5	22
Delaware	19.7	23	11.5	43	26.9	31	19.5	49	9.6	29	24.9	48	36.9	37
District of Columbia	19.6	26	8.6	50	21.9	50	19.6	48	8.2	42	30.1	36	43.3	13
Florida	17.7	36	21.9	7	25.2	40	27.5	21	11.4	9	31.6	29	45.3	9
Georgia	20.4	20	23.2	4	29.1	20	24.0	34	9.9	22	30.6	34	39.9	24
Hawaii	14.6	49	10.4	48	23.6	47	23.1	37	7.8	44	35.6	16	37.3	35
Idaho	16.4	44	19.3	14	26.8	32	35.4	2	8.5	39	34.6	20	48.0	4
Illinois	18.6	31	16.8	28	28.1	24	26.5	23	9.4	30	35.7	15	47.5	6
Indiana	**24.0**	**6**	**18.0**	**21**	**31.4**	**8**	**32.3**	**7**	**10.9**	**11**	**37.5**	**11**	**42.9**	**14**
Iowa	18.1	33	11.0	46	30.4	12	24.2	33	9.7	26	30.7	32	29.9	51
Kansas	19.4	27	17.0	27	29.9	14	25.5	29	9.4	30	32.7	26	33.3	45
Kentucky	28.3	1	17.1	26	31.3	9	28.7	17	10.7	12	34.1	22	38.2	33
Louisiana	24.8	5	21.6	8	34.7	1	24.8	32	12.3	3	38.1	9	36.2	40
Maine	20.3	22	12.9	41	28.4	23	20.4	45	9.7	26	24.7	49	38.7	32
Maryland	16.2	46	13.2	38	27.6	26	20.6	44	10.2	20	27.6	41	36.8	38
Massachusetts	16.4	44	5.8	51	22.9	49	15.4	51	8.3	40	23.3	50	36.4	39
Michigan	23.3	10	13.7	36	31.1	10	23.4	35	10.5	17	27.3	42	44.6	11
Minnesota	18.8	30	11.1	45	25.7	36	21.7	42	7.3	47	25.9	45	34.5	42
Mississippi	24.0	6	22.6	5	34.6	2	32.3	7	12.5	2	39.7	1	37.6	34
Missouri	23.9	8	16.7	29	29.6	17	27.1	22	10.7	12	33.5	24	32.7	46
Montana	19.7	23	18.8	18	24.3	44	33.8	3	7.2	49	38.5	6	42.5	16
Nebraska	19.7	23	14.9	34	28.6	22	30.0	14	8.1	43	35.6	16	37.1	36
Nevada	18.1	33	25.5	2	26.2	34	33.2	5	8.9	36	39.4	2	50.0	1
New Hampshire	17.2	40	13.0	40	27.3	28	20.2	46	9.1	34	22.4	51	41.1	20
New Jersey	17.3	39	15.4	31	24.6	42	23.0	38	9.3	32	35.1	18	38.8	30
New Mexico	19.3	28	22.2	6	27.1	30	31.8	10	10.3	19	38.7	5	42.2	18
New York	16.2	46	15.3	32	23.6	47	21.6	43	9.7	26	28.3	39	44.9	10
North Carolina	20.9	18	21.0	11	29.6	17	24.9	31	10.4	18	29.4	37	31.6	48
North Dakota	21.2	17	13.5	37	29.7	15	26.4	25	8.6	38	38.0	10	40.3	23
Ohio	23.3	10	14.6	35	30.1	13	25.8	27	11.7	6	35.0	19	39.0	29
Oklahoma	23.3	10	18.0	21	32.2	6	33.7	4	11.5	8	38.3	8	32.2	47
Oregon	17.9	35	19.0	17	27.3	28	28.8	16	9.9	22	30.7	32	46.1	8
Pennsylvania	21.4	16	13.1	39	29.1	20	25.4	30	10.2	20	31.2	31	39.8	28
Rhode Island	17.4	38	15.2	33	25.7	36	18.9	50	9.8	24	25.3	47	42.4	17
South Carolina	22.5	13	21.6	8	31.6	7	28.6	18	11.6	7	31.4	30	39.9	24
South Dakota	22.0	14	11.5	43	28.1	24	26.5	23	7.8	44	34.4	21	33.6	44
Tennessee	24.9	4	18.0	21	31.1	10	26.0	26	11.9	5	32.2	27	30.1	50
Texas	18.2	32	30.6	1	29.2	19	31.6	11	10.6	14	37.4	12	40.6	21
Utah	10.6	51	17.8	24	24.3	44	31.5	12	7.2	49	28.1	40	44.0	12
Vermont	16.5	43	9.9	49	23.7	46	23.4	35	7.3	47	26.0	44	35.8	41
Virginia	19.0	29	15.5	30	27.4	27	22.3	40	10.6	14	30.5	35	39.9	24
Washington	17.2	40	17.8	24	26.8	32	28.0	19	8.8	37	29.0	38	39.9	24
West Virginia	28.2	2	19.2	15	33.8	4	27.8	20	13.0	1	36.5	14	31.1	49
Wisconsin	20.4	20	12.2	42	29.7	15	22.1	41	8.3	40	26.1	43	49.5	2
Wyoming	21.8	15	20.7	12	24.6	42	38.1	1	9.1	34	39.1	4	46.7	7
Range	10.6-28.3		5.8-30.6		20.5-34.7		15.4-38.1		7.0-13.0		22.4-39.7		29.9-50.0	
National Median	19.6		17.1		27.6		26.0		9.7		32.7		39.9	

*Prevalence weighted to landline and cellphone households. BRFSS data from 2011 and 2012 are not directly comparable to previous years.

**Adults age 50 years and older

NOTE: Each percent has a different standard error and confidence interval.

Because of this, rankings are not truly meaningful.

Unknown and refused responses are not included.

A ranking between 1 and 25 (above the median value) implies poor status relative to other states.

Data obtained from CDC BRFSS Prevalence and Trends Data accessed August 2, 2013

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 visit http://www.in.gov/isdh/17193.htm.

ISDH Data Reports

The following data reports and the *Indiana Epidemiology Newsletter* are available on the ISDH webpage:
http://www.IN.gov/isdh/

HIV/STD/Viral Hepatitis Semi-Annual Report (June 2007 – June 2012)	Indiana Mortality Report (1999-2011)
Indiana Cancer Reports: Incidence; Mortality; Facts & Figures	Indiana Linked Infant Birth/Death Report (1999, 2002, 1990-2003)
Indiana Health Behavior Risk Factors Report (1999–2010)	Indiana Natality Report (1998–2010)
Indiana Health Behavior Risk Factors (BRFSS) Newsletter (2003–2013)	Indiana Induced Termination of Pregnancy Report (1998–2012)
Indiana Hospital Consumer Guide (1996)	Indiana Marriage Report (1995, 1997-2004)
Public Hospital Discharge Data (1999–2011)	Indiana Infectious Disease Report (1997 - 2010)
Assessment of Statewide Health Needs (2007)	Indiana Maternal & Child Health Outcomes & Performance Measures (1989-1998 through 2000–2009)

HIV Disease Summary

Information as of June 30, 2013*

HIV - without AIDS:

398	New HIV cases from April 1, 2013 thru June 30, 2013	12-month incidence	6.14 cases/100,000
4,984	Total HIV-positive, alive and without AIDS on June 30, 2013	Point prevalence	76.87 cases/100,000

AIDS cases:

345	New AIDS cases from April 1, 2013 thru June 30, 2013	12-month incidence	5.32 cases/100,000
5,936	Total AIDS cases, alive on June 30, 2013	Point prevalence	91.55 cases/100,000

12,079 Total AIDS cases, cumulative (alive and dead) on June 30, 2013

*rates based on Indiana 2010 population of 6,483,802

Reported cases of selected notifiable diseases		
Disease	**Cases Reported in April - June**	
	2012	**2013**
Animal Bites	1,283	1,650
Brucellosis	1	0
Campylobacteriosis	105	107
Chlamydia	7,005	6,166
Cryptococcus	5	6
Cryptosporidiosis	19	9
Dengue	0	0
E. coli, shiga toxin-producing	31	18
Giardiasis	25	39
Gonorrhea	1,646	1,581
Haemophilus influenzae, invasive	19	39
Hemolytic Uremic Syndrome (HUS)	3	0
Hepatitis A	1	9
Hepatitis B	18	23
Hepatitis C (acute)	25	7
Hepatitis D	0	0
Hepatitis E	0	1
Histoplasmosis	27	17
Influenza-Associated Death	2	3
Legionellosis	5	22
Listeriosis	1	3
Lyme Disease	19	9
Malaria	1	4
Measles (rubeola)	0	0
Meningitis, other	2	3
Meningococcal, invasive	0	4
Mumps	2	0
Pertussis (Whooping Cough)	53	55
Rabies, Animal	6	3
Rocky Mountain Spotted Fever	1	1
Rubella	0	0
Salmonellosis	140	154
Shigellosis	9	25
Severe *Staphylococcous aureus* Infection in Previously Healthy Person	4	7

Reported cases of selected notifiable diseases (cont.)		
Disease	**Cases Reported in April - June**	
	2012	**2013**
Group A Streptococcus, invasive	37	39
Group B, Streptococcus, Invasive (All ages)	67	78
Streptococcus pneumoniae (invasive, all ages)	129	211
Streptococcus pneumoniae (invasive, drug resistant)	34	51
Streptococcus pneumoniae (invasive, <5 years of age)	7	10
Syphilis (Primary and Secondary)	39	69
Toxic Shock Syndrome, streptococcal (STSS)	3	2
Tuberculosis	24	23
Tularemia	0	1
Typhoid Fever	0	0
Typhus/Rickettsial disease	0	0
Varicella (Chickenpox, confirmed and probable)	34	29
Varicella (Hospitalization or Death)	1	2
Vibriosis (non-cholera Vibro species infections)	0	0
West Nile Virus neuroinvasive disease	0	1
Yersiniosis	2	1
For information on reporting of communicable diseases in Indiana, call the *ERC Surveillance and Investigation Division* at 317.233.7125.		

Epidemiology Terms

fomite

a physical object that serves to transmit an infectious agent from person to person.

risk

The probability that an individual will be affected by, or die from, an illness or injury within a stated time or age span

outbreak

(localized epidemic) – more cases of a particular disease than expected in a given area or among a specialized group of people over a particular period of time.

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

FIND US ON THE WEB

http://www.in.gov/isdh/25154.htm

Indiana State Department of Health
Epidemiology Resource Center

Social Media

The Indiana State Health Department is on social media! Check out our social media pages for the latest health information, updates, event information and photos. Like us on Facebook at www.facebook.com/ISDH1. Follow us on Twitter @StateHealthIN. Watch videos on YouTube.

CDC Learning Connection

CDC TRAIN is a component of the CDC Learning Connection. The goal of the CDC Learning Connection is to help the public health community locate training and resources provided by CDC and CDC partners.

Please visit www.cdc.gov/learning, *where the public health community goes to learn.*

Link. Log in. Learn. CDC Learning Connection (CDC LC) is a one-stop learning resource that can help increase public health knowledge and skills and meet professional development needs. CDC LC was created to increase access to quality public health learning.

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- Quality e-learning
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These features form a learning system that provides free access to products developed by CDC, CDC partners, and other organizations recognized for developing public health education and training resources. Although the CDC LC is intended for the public health community, it can be accessed by healthcare professionals and the general public.