Indiana Epidemiology Newsletter

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Cancer Screenings: Data from the 2010 Indiana Behavioral Risk Factor Surveillance System

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Cancer is the second leading cause of death of Indiana residents. According to the Indiana Cancer Consortium (ICC), the state's vehicle for cancer control, about 85 residents are diagnosed with new cases of cancer every day. Timely cancer screenings for four cancers (breast, cervical, colon and rectal, and prostate) are valuable for early detection, which can save lives and increase treatment options. Developed by the ICC, the Indiana Cancer Control Plan 2010-2014 outlines early detection objectives and evidence based strategies to increase cancer screenings.

Many health conditions and behaviors are not reportable; hence, prevalence data must be obtained from another source. The Behavioral Risk Factor Surveillance System (BRFSS) is an annual random digit-dial telephone survey of adults aged 18 years and older. The BRFSS is conducted through a cooperative agreement with the Centers for Disease Control and Prevention, and all states and the District of Columbia participate.

The BRFSS relies on self-reported data. This type of survey has certain limitations that should be understood when interpreting the data. Many times, respondents have the tendency to underreport behaviors that may be considered socially unacceptable (e.g., smoking, driving after drinking alcohol). Conversely, respondents may over report behaviors that are desirable (e.g., physical activity, fruit and vegetable consumption).

Information on cancer screenings of Indiana adults in this report was obtained from the 2010 BRFSS survey. Respondents were asked if they had had cancer screenings to detect cancers of the breast, cervix, colon and rectum, and prostate. Additional questions gathered information to determine if the screenings were done as recommended. These data support the evaluation of the Indiana Cancer Control Plan 2010-2014.

Breast Cancer
Currently, 60% of breast cancers are diagnosed at a localized stage, for which the five-year survival rate is 98% (SEER Cancer Statistics Review, 1975-2004, 2007). The American Cancer Society (ACS) screening guidelines recommend that average-risk women aged 40 years and older receive mammography screening on an annual basis.

According to the ACS, mammography usage has not increased since 2000. In 2010, 61.3% of Indiana females aged 40 years and older reported having a mammogram within the past 12 months compared to 65.3% nationally. Having a routine source of medical care is an indicator of access to preventive health care services and is related in part to health care coverage (ACS). Females with health care coverage were more likely than those without health care coverage to have had a mammogram within the past year (63.4% vs. 39.8%, respectively). Females with one or multiple personal doctor(s) or health care provider(s) were more likely to have had a mammogram in the previous two years (62.7%) than those without one (34.3%). Females with a checkup in the past year were more likely to have had a mammogram in the past year (69.8%) than those with a checkup in the past one to two years (40.2%), two to five years (32.3%) and five or more years (28.6%). Females who were college graduates were more likely than those with less than a high school education to have had a mammogram in the past year (63.8% vs. 47.5%, respectively). Similar results were found by income.

Per the Indiana Cancer Control Plan 2010-2014, the target breast cancer screening rate for 2014 is 67%. The ICC established the Breast and Cervical Cancer Action Team to address this priority objective, as well to increase cervical cancer screening rates.

Cervical Cancer
Most of the reduction in cervical cancer incidence and mortality rates has been attributed to the Pap test, which detects cervical cancer and precancerous lesions, and cervical cancer is now one of the most successfully controlled cancers in developed countries (ACS). The percent of females aged 18 years and over having a Pap test in the past three years has been stable from 2004-2010 in Indiana, which is similar to national findings. The ACS recommends that cervical cancer screening should begin approximately three years after a woman begins having vaginal intercourse, but no later than 21 years of age. Screening should be done every year with conventional Pap tests or every two years using liquid-based Pap tests. Women aged 30 years and older should consult their physician for screening recommendations.

Overall in 2010, 80.2% of Indiana women aged 18 years and older reported having a Pap test within the past three years; the target for 2014 is 87%. The national median was 81.0%. Black females were more likely than whites to have had a Pap test within the past three years (86.6% vs. 79.5%, respectively). The percent for Hispanic females (84.3) was not different from white or black females. The percent of females having a Pap test within the past three years decreased by age, from 90.2% for those aged 25-34 years to 58.6% for those aged 65+ and increased with income and education. As with mammograms, females with health care coverage, those with a health care provider and a regular checkup within the past two years were more likely than those without to have had a Pap test in the past three years.

Prostate Cancer
Other than skin cancer, prostate cancer is the most common type of cancer among American men, and is the second leading cause of cancer death. Mortality trends for prostate cancer have been declining.

The ACS recommends that asymptomatic men who have at least a 10-year life expectancy have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer after receiving information about the uncertainties, risks, and potential benefits associated with prostate cancer screening.

In 2010, 64.4% of males aged 40 and over reported ever having a prostate-specific antigen (PSA) test. The prevalence increased with age (22.8% for males aged 40-44 to 70.8% for 65+) and education (41.6% for less than high school education to 60.7% for college graduates). There were no differences among income levels.

About 53% (52.4) percent of males aged 40 years and older reported having a PSA test within the past two years. The prevalence increased with age (16.0% for males aged 40-44 years to 78.7% for males aged 65 years and older). College graduates were more likely than those with less than a college education to have had a PSA test within the past two years.

Males aged 40 or more years with health care coverage were more than twice as likely to have had a PSA test within the past two years (56.1% vs. 24.6%, respectively). Males without a health care provider were the least likely to have had a PSA test within the past two years (15.1%) compared to those with one (57.4%) or multiple health care professionals (62.9%).

Colorectal Cancer
Colorectal cancer is the third leading cause of cancer death in the US for both men and women. The relative five-year survival rate is 90% for colorectal patients diagnosed at an early, localized state; however, only 39% of cases are diagnosed at this stage. Of the 49,380 people expected to die from this cancer in 2011, screening/early detection tests could save more than half (ACS).

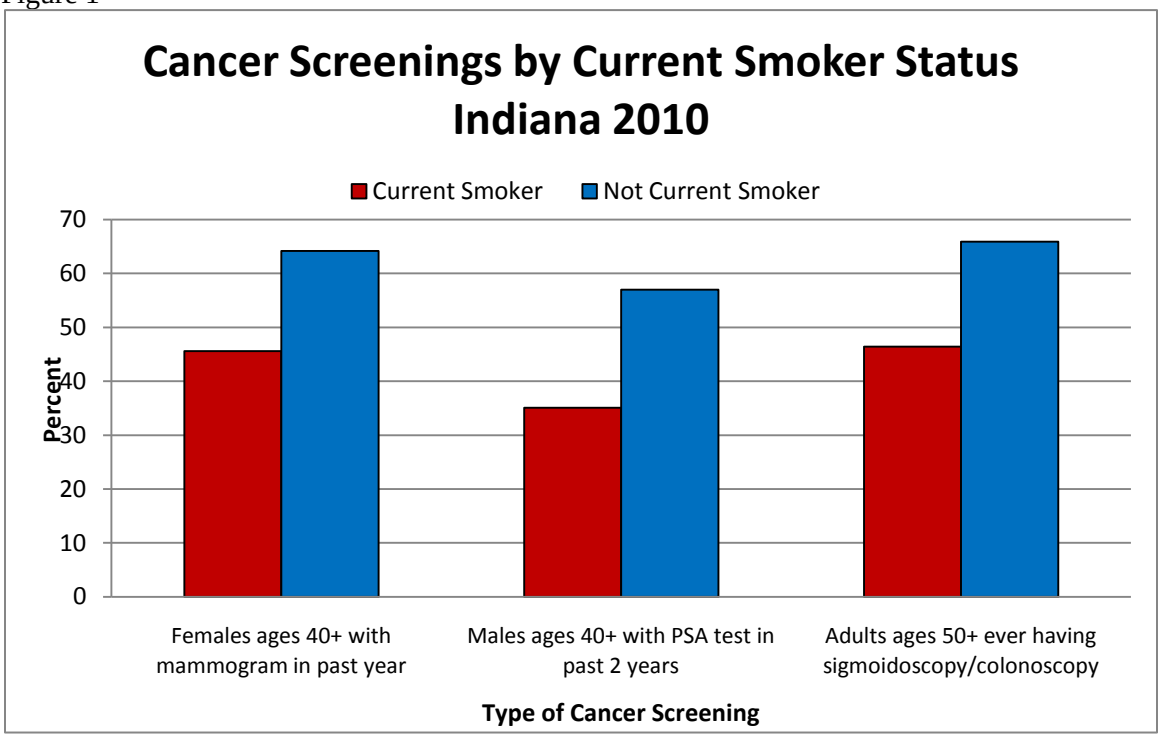
The ACS recommends that adults aged 50 years and older have a sigmoidoscopy every five years or a colonoscopy every 10 years. The percent of Indiana adults aged 50 years and over who have ever had a sigmoidoscopy or colonoscopy has increased dramatically from 44.1% in 2002 to 62.8% in 2010; the 2014 target is 67%. National results are similar. More Indiana adults reported having a colonoscopy than a sigmoidoscopy (93.7% vs. 6.3%). The percent of adults aged 50 and older who ever had a sigmoidoscopy or colonoscopy increased with age, education and income. There were no differences between white and black adults.

Adults with health care coverage were more likely than those without to have ever had a sigmoidoscopy or colonoscopy (65.1% vs. 37.7%, respectively). As with other cancer screenings, those with one or more health professionals were more likely than those without to have ever had a sigmoidoscopy or colonoscopy. Adults with a checkup in the past year were the most likely to have had a sigmoidoscopy or colonoscopy.

Current Smoking and Cancer Screenings

Tobacco use increases the risk of cancers of the colon/rectum and uterine cervix, and the Interagency for Research on Cancer recently concluded that there is limited evidence that tobacco smoking causes female breast cancer (ACS). In 2010 there were differences for having certain cancer screenings between current and not-current smokers (Figure 1). There were no differences among female current smokers and not current smokers for having had a Pap test within the past three years.

Figure 1



For additional information on these subjects, please visit the ICC website at http://indianacancer.org/ and the American Cancer Society at http://www.cancer.org/,and download a copy of the Indiana Cancer Control Plan 2010-2014.

Mandates for Influenza Vaccination of Health Care Workers

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In 1981, the Centers for Disease Control and Prevention (CDC) issued a recommendation that health care workers (HCWs) should receive annual influenza immunization. Since that time, HCWs have demonstrated a low compliance level through voluntary methods, highlighting the importance of education and incentive programs in receiving influenza vaccine. Findings from the National Health Interview Survey show HCW influenza vaccination rates did not change significantly from the 2003-04 (44.8%) through the 2007-08 seasons (49.0%). While employer policies requiring HCWs to be immuned against measles, mumps, rubella, varicella, and hepatitis B are standard and well-accepted, influenza vaccination mandates have been resisted.

Dr. Gregory Poland is director of Mayo Clinic's Vaccine Research Group and serves as an editor for the journal *Vaccine* has been a proponent of mandated influenza vaccination for HCWs on the national stage. Poland says that such a mandate would decrease the U.S. health care system's yearly all-cause mortality rate by half. He has published "the seven truths we must accept" as a platform of support that has emerged from decades of research:

The First Truth: Influenza infection is a serious illness causing significant morbidity and mortality adversely affecting the public health on an annual basis.

The Second Truth: Influenza-infected health care workers can transmit this deadly virus to their vulnerable patients.

The Third Truth: Influenza vaccination of health care workers saves money for employees and employers and prevents workplace disruption.

The Fourth Truth: Influenza vaccination of health care workers is already recommended by the CDC and is the standard of care.

The Fifth Truth: Immunization requirements are effective and work in increasing vaccination rates.

The Sixth Truth: Health care workers and health care systems have an ethical and moral duty to protect vulnerable patients from transmissible diseases.

The Seventh Truth: The health care system will either lead or be lambasted.

Now mounting numbers of professional organizations and societies are concluding that a requirement for HCW influenza immunization is the only means to achieve the goal of adequately protecting patients and reducing transmission of influenza in the health care setting. Ten professional associations have recently developed or strengthened position statements that endorse influenza vaccination mandates for healthcare workers. These include:

- American Academy of Pediatrics (AAP)
- American College of Physicians (ACP)
- American Public Health Association (APHA)
- American Medical Directors Association (AMDA)
- Association for Professionals in Infection Control and Epidemiology (APIC)
- Infectious Diseases Society of America (IDSA)
- National Foundation for Infectious Diseases (NFID)
- National Patient Safety Foundation (NPSF)
- Society for Healthcare Epidemiology of America (SHEA)
- American Pharmacists Association (APhA)

One grass roots effort is already underway to facilitate adoption of influenza vaccination as an added requirement for hospital employees. The Mandatory Influenza Immunization Sub-team of the Community Patient Safety Coalition (CPSC) held a meeting on May 6, 2011, in Evansville, Indiana. The participating hospitals in this regional coalition include those located in southwestern Indiana and the Henderson, Kentucky area.

During the May meeting, Sonya Mauzey, Infection Preventionist at Deaconess Women's Hospital in Evansville, shared documents and procedures that her hospital built upon when they put these measures into practice during the 2008-09 influenza season. The

hospital CEO/CNO, Chris Ryan, gave full endorsement of adding influenza to those diseases in which employees must show proof of immunity. The original policy applied to HCWs with direct patient contact but has now been expanded to all employees. Staff members who have a medical contraindication to influenza vaccination must provide a physician statement. No other declinations are allowed. Mauzey says the hospital now has a workforce that is over 98% compliant with seasonal influenza vaccination, and no individuals voluntarily separated from employment due to the new requirement.

Discussion among the other representatives centered on the challenges of implementing the mandatory influenza vaccination policies. Topics included a lack of physician leadership to support this as a wise course of action, counteracting a culture that continues to have concerns over vaccine safety, and recognizing that early and frequent staff education would be critical to success. All agreed to pursue a policy specifying influenza vaccination as a condition of employment for healthcare personnel as part of a comprehensive infection control program. The Deaconess Health System is enacting a HCW influenza immunization policy change this fall. All other hospitals felt implementation in the following year was more feasible due to various reasons, such as influenza vaccine orders already based on previous uptake and the need to cultivate more endorsement from administration and physicians.

The following recommendation was incorporated in the group's position paper: "Consequently, the CPSC Sub-team for Mandatory Influenza Vaccines recommends that all facilities participating in the CPSC should adopt the policy of requiring influenza vaccinations for all employees, unless medically contraindicated, as a condition of employment." This position statement was presented before the CPSC Steering Committee on July 12, 2011. The Committee accepted it, and members will add their names to the list of endorsers and forward it to the CPSC Board of Directors.

The author wishes to acknowledge Sonya Mauzey, Infection Preventionist, Deaconess Hospital, for her contributions to this article.

References:

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Is a Cancer Cluster in My Neighborhood?

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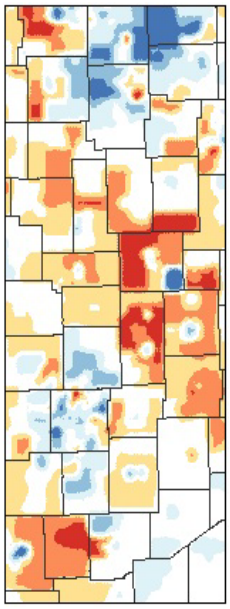
ERC Public Health Geographics

Latest in a series of articles on the Indiana State Cancer Registry

Previous editions of the *Indiana Epidemiology Newsletter* featured an overview of the National Program of Cancer Registries (NPCR). This article will briefly discuss how the

Indiana State Department of Health's (ISDH) Epidemiology Resource Center utilizes Indiana State Cancer Registry (ISCR) data, spatial analysis methodologies and Geographic Information Systems (GIS) to provide preliminary assessments of cancer incidence within a community.

Actionable Intelligence



The ISDH routinely receives inquiries from Indiana residents who are concerned that they reside in an area of high cancer incidence. They might know many neighbors and friends who have been diagnosed with cancer or have read published statistics available in numerous on-line resources. Many seek evidence which confirms or refutes their suspicions. Cancer clusters occur when there are more cancer cases than are statistically expected in a specific geographic area during a certain time. Clusters are typically limited to one type of cancer or a rare form of it, or a type of cancer that strikes people at an age when they usually are not at risk. Fortunately, the ISDH has access to data, technology and epidemiologic capacity to effectively determine the presence of cancer clusters in specific communities.

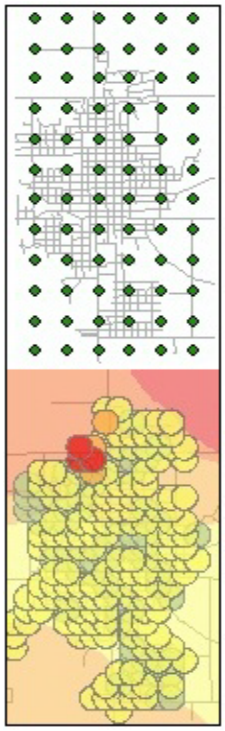
The cancer data collected by the ISCR provides the information necessary to conduct a variety of analyses, including geospatial. By applying various geospatial concepts and tools to ISCR data, the Public Health Geographics Team (PHG) surveys the distribution of cancer incidence across multiple geo-temporal (i.e. space and time) scales and identifies potential health concerns within a geographic area based upon a stated case definition. While the county of residence is commonly utilized as a unit of measurement to describe diseases such as cancer, PHG drills-down into communities beyond county boundary limitations to apply small-area analyses. The basis for this scale of assessment is the geographic coding (geocoding) procedures applied by the ISCR and PHG. Each reported cancer diagnosis is assigned a geographic coordinate and a Census block identifier by PHG's GeoRunner web service — an application which cleans and geocodes agency address data. However, both the geocoding process and small-area analyses introduce significant spatial uncertainty that must be considered when interpreting the statistical or visual results.

Areal Analysis (Aggregation of Data by Geography)

The aggregation of cancer incidence into defined geographic units provides opportunities to apply reliable statistical measurements for detecting geospatial variations and patterns. This capability is primarily because of the collection and publication of population demographics by the U.S. Census. Yearly population summaries by geography, age and sex allow for various statistical adjustments to better describe the at-risk population in relation to the observed incidence. PHG calculates statistics for various geographic units including preparedness districts, counties, townships, census tracts, and even watersheds.

Additional benefit is provided through measuring spatial patterns and variations among geographic units. This can be accomplished either statistically or visually. For instance, adjacent units having higher than expected incidence rates might indicate a cluster. Spatial smoothing techniques can be applied to help decrease uncertainty for those areas with lower statistical confidence. Additionally, spatial interpolation methods offer visualization techniques that can present a more fluid prediction of incidence at any given location.

With any of the various techniques used to measure the geographic distribution of incidence, acknowledgement of confidence and error must be made before interpreting results. Much of this uncertainty is attributable to low incidences of many cancers. This can sometimes be overcome by aggregating multiple years or geographic units into a single statistic. However, one limitation of this type of analysis is that only the residence at diagnosis is considered. This might incorrectly infer that the residential location has a meaningful correlation to the disease, as it does not take into account the latency of the cancer, behaviors associated with the cancer (e.g., smoking, alcohol use), or exposure to other locations (e.g., workplace, prior residences).



Point Analysis (By Incident Location)

Surveying locations of cancer incidents by residence at diagnosis offers a rudimentary depiction of cancer distribution within the community. In addition to common data limitations of interpreting cancer incidence patterns in aggregated datasets, a point-analysis introduces potential spatial errors and misinterpretations. First, one must consider the spatial accuracy of the coordinates generated by the geocode and the degree with which the geocoding was unsuccessful (e.g. unmatched records and false-positive matches). Secondly, it should **not** be assumed that multiple incidents in close proximity indicate a cluster. Because cancer is a common disease within the general population, the underlying distribution and demographic characteristics of the population at risk **must** be factored into the analysis to determine if it is occurring more than what is expected.

In a novel approach to surveying cancer incidence within a community, PHG is exploring existing spatial filtering methods to describe the distribution of incidence locations with regards to the underlying population. The approach relies upon an estimated population per known household which is derived from census block population estimates, Homeland Security rooftop address points and local parcel land-use categories. The methods provide a grid of crude localized rates of incidence at small intervals across the entire area of interest. Those grid rates exceeding a designated threshold may warrant further assessment of individual cases to detect similarities and relationships among each diagnosis in the geographic area.

Point analysis results and visualizations must be interpreted carefully since the methods apply extremely small incidence and population data within a small geographic area. As such, statistical confidence is low and perceived spatial patterns might be occurring by chance. Any inaccuracies describing cancer diagnosis, geographic positioning or population distribution can significantly alter results. However, the objective is to assist in the detection of small-area variations of incidence to begin answering the question — is a cancer cluster in my neighborhood?

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/17193.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/

HIV/STD Spotlight Reports (June 2007, December 2007, June 2008, January 2009)	Indiana Mortality Report (1999-2007)
Indiana Cancer Report: Incidence; Mortality; Facts & Figures	Indiana Infant Mortality Report (1999, 2002, 1990-2003)
Indiana Health Behavior Risk Factors (1999-2008)	Indiana Natality Report (1998-2007)
Indiana Health Behavior Risk Factors (BRFSS) Newsletter (2003-2010)	Indiana Induced Termination of Pregnancy Report (1998-2007)
Indiana Hospital Consumer Guide (1996)	Indiana Marriage Report (1995, 1997, & 2000-2004)
Public Hospital Discharge Data (1999-2008)	Indiana Infectious Disease Report (1997-2009)
Assessment of Statewide Health Needs – 2007	Indiana Maternal & Child Health Outcomes & Performance Measures (1989-1998, 1990-1999, 1991-2000, 1992-2001, 1993-2002, 1994-2003, 1995-2004, 1996-2005)

HIV Disease Summary

Information as of June 30, 2011 **based on 2000 population of 6,080,485**

HIV - without AIDS to date:

332	New HIV cases from July 2010 thru June 30, 2011	12-month incidence	5.46 cases/100,000
4,528	Total HIV-positive, alive and without AIDS on June 30, 2011	Point prevalence	77.47 cases/100,000

AIDS cases to date:

342	New AIDS cases from July 2010 thru June 30, 2011	12-month incidence	5.62 cases/100,000
5,486	Total AIDS cases, alive on June 30, 2011	Point prevalence	90.22 cases/100,000
11,283	Total AIDS cases, cumulative (alive and dead) on June 30, 2011		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in May – June *MMWR* Weeks 18-25		Cases Reported in January - June *MMWR* Weeks 1-25	
	2010	2011	2010	2011
Campylobacteriosis	162	66	338	222
Chlamydia	2,852	4,631	4,998	9,495
Cryptococcus	7	6	14	20
Cryptosporidiosis	37	6	117	44
E. coli, shiga toxin-producing	17	5	24	16
Giardiasis	47	26	162	119
Gonorrhea	766	1,100	1,433	2,317
Haemophilus influenzae, invasive	17	26	52	62
Hemolytic Uremic Syndrome (HUS)	1	0	1	1
Hepatitis A	0	2	9	10
Hepatitis B	9	6	36	22
Hepatitis C Acute	8	3	17	41
Histoplasmosis	19	12	53	55
Influenza Deaths (all ages)	0	0	2	24
Legionellosis	13	4	23	15
Listeriosis	4	0	7	1
Lyme Disease	28	11	39	14
Measles	0	0	0	0
Meningococcal, invasive	1	1	13	10
Mumps	1	0	3	0
Pertussis	149	17	275	103
Rocky Mountain Spotted Fever	0	0	0	0
Salmonellosis	107	72	251	181
Shigellosis	9	7	26	31

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in May – June *MMWR* Weeks 18-25		Cases Reported in January - June *MMWR* Weeks 1-25	
	2010	2011	2010	2011
Severe *Staphylococcous aureus* in Previously Healthy Person	2	1	12	7
Group A Streptococcus, invasive	23	23	76	114
Group B, Streptococcus, Invasive (All ages)	39	39	148	135
Streptococcus pneumoniae (invasive, all ages)	86	92	432	431
Streptococcus pneumoniae (invasive, drug resistant)	24	28	134	120
Streptococcus pneumoniae (invasive, <5 years of age)	3	3	31	22
Syphilis (Primary and Secondary)	31	24	34	52
Tuberculosis	9	9	22	26
Vibriosis	1	0	4	1
Varicella (hospitalization or death)	1	0	4	1
Yersiniosis	1	1	5	3
Animal Rabies	6	4	6	4

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

Indiana State Department of Health
Epidemiology Resource Center
2 North Meridian Street, 5 K
Indianapolis, IN 46204
317/233-7125

Cover photo of Cryo-EM reconstruction of a norovirus capsid.courtesy of Dr. B.V.V. Prasad, Baylor College of Medicine, Houston, TX 77030

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