Indiana Epidemiology Newsletter

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Stay Healthy at Animal Exhibits

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During 1996-2010, approximately 150 disease outbreaks involving animals in public settings were reported to the CDC along with numerous individual exposures. It is recommended that managers of county fairs and other venues where animal exhibits are displayed, in consultation with veterinarians and public health officials, review the guidance in the **Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011.** The CDC and the National Association of State Public Health Veterinarians updated this publication on May 6, 2011to include guidelines based on recent outbreaks for preventing illness.

As summer arrives many venues such as county fairs, petting zoos, and farm educational tours place children of all ages and adults in contact with animals. Exploring the animal world has many positives. However, there is a risk of becoming very ill after contact with animals and their surroundings if proper precautions are not taken. Young children (<5 years) and adults with weakened immunity are more likely to become ill. Animals can be healthy and clean but still intermittently excrete harmful organisms such as *E. coli* 0157:H7, *Salmonella* and *Cryptosporidium* in their feces.

Infections with enteric bacteria and parasites pose the highest risk for human disease. The primary mode of transmission is fecal-oral. Animal fur, hair, skin and saliva can retain these organisms. Transmission has been found to occur from objects such as shoes, clothing, animal cages, contaminated bedding, hand rails or wherever the animals may walk or roam. An outbreak described in the compendium indicated that *E. coli* 0157:H7 can survive in the soil for months. When placed in a stressful or new environment, the animals are more likely to excrete harmful organisms. The prevalence of certain enteric pathogens is often higher in young animals which are frequently used in petting zoos.

Some of the tips provided in this document include:

1. Wash your hands after visiting an animal exhibit, not just after petting the animals. Railings can also be soiled with bacteria. Signs recommending hand washing and locations of hand washing facilities should be posted. Hand washing stations should be positioned for children to reach.
2. Don't bring food or drinks into an area where animals are being housed.
3. Don't share food with animals.
4. Don't take strollers, bottles, pacifiers, spill-proof cups or toys in animal areas. Do not smoke in the animal areas.
5. Design exhibits so animal areas are separate from areas where people may eat food. Transition areas between animal areas and non-animal areas are recommended.
6. Don't clean animal cages or enclosures in sinks or areas used to prepare food or drinks. Manure disposal and sewage runoff should be properly maintained. Shovels and pitchforks used for waste removal should be stored in a designated area.
7. Animal caretakers should keep animals clean and free of intestinal parasites, fleas, ticks, mites and lice. Animals ill with diarrhea should be removed (although many animals do not exhibit symptoms and can still shed pathogens).
8. Visitors should receive information about disease risk and prevention procedures. Venue operators should receive educational information in this compendium. (Outbreak investigations indicate education reduces risk).

Managers or county fair boards in charge of events with animals should be made aware of these guidelines to help prevent possible disease transmission. The compendium includes hand washing posters, hand washing instructions, facility designs, and various preventative tips. Outbreaks of animal related diseases can have substantial medical, public health and economic effects for all those involved.

References:

Healthy Pets Healthy People**,** www.cdc.gov/Healthypets/browse_by_animal.htm
Stay Healthy at Animal Exhibits This Summer, www.cdc.gov/Features/Animal Exhibits/
Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, www.cdc.gov/mmwr/preview/mmwrhtml/rr5085a1.htm

Sun Safety

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Every spring starts with the desire to be outside after being cooped up all winter long. It is important to remember that too much of the sun's ultraviolet radiation (UV) can cause sunburn, skin or eye damage, and skin cancer. In Indiana there were 1,154 new cases of melanoma reported in 2007 with 261 deaths.

During 1998–2007, the incidence rate was more than 6.5 times higher among whites than blacks (17.7 compared to 2.7 cases per 100,000 persons); among whites, the incidence rate was 52% higher among males than females (22.3 compared to 14.7 cases per 100,000 persons).

Everyone is exposed to UV radiation from the sun. However it is the overexposure to UV during childhood and adolescence that is a major factor in determining future skin cancer risk. Too little UV from the sun can lead to low vitamin D levels. Vitamin D is necessary for the development and maintenance of healthy bones and muscles, and for general health.

There are three types of UV radiation, categorized by wavelength: UVA and UVB.

- **UVA** can cause sunburn, DNA (cell) damage in the skin and skin cancer. Small daily doses of UVA cause long-term skin injury, even without signs of sunburn because it penetrates deeper into the skin than UVB.
- **UVB** causes skin damage and skin cancer. The ozone stops most UVB from reaching the Earth's surface. UVB can do more damage more quickly than UVA rays. Because of its damaging effect to the DNA of skin cells, UVB radiation is the main cause of sunburn and skin cancer. This type of radiation intensifies during the summer and with higher elevations.

The level of UV radiation reaching the Earth's surface varies depending on the ozone layer, time of day, time of year, latitude, altitude, weather conditions and reflection. For example, UV rays tend to be deflected back into space on cloudy days and are reduced but not eliminated; therefore you can still get a sunburn on a cloudy day. UV rays tend to be the most intense when the sun is highest in the sky. Any or all of these factors can increase risk of UV radiation overexposure and consequently lead to unhealthy effects.

When the sun's ultraviolet radiation reaches the skin, the skin reacts by producing melanin, a skin pigment that serves to protect skin from further damage. Therefore, tanning after sun exposure is the body's way to respond to sun damage.

One way to practice prevention is by watching the UV Index forecasts the strength of the sun's harmful rays. Higher numbers mean greater risk of sun damage. You can find the UV Index and UV Alert forecasts for your area by visiting the EPA's SunWise Web site at www.epa.gov/sunwise/uvindex.html. The resulting UV forecast will indicate if there is a UV Alert.

A healthy balance of UV exposure is important for a person's health. Simple ways to prevent UV overexposure include:

- avoid sunburns and tanning beds
- use sunscreen with an SPF of at least 15 every day,
- wear light clothing or UV resistant clothing, including a hat
- seek shade when possible,
- watch the UV Index
- use extra caution when near water, snow, & sand, which are highly reflective
- avoid the sun from 10am – 3pm when UV Index is over 6.

References:
Centers for Disease Control & Prevention:
http://www.cdc.gov/cancer/skin/basic_info/prevention.htm
U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2007 Incidence and Mortality Web-based Report.* Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2010.
Indiana State Department of Health:
http://www.in.gov/isdh/files/Indiana_Cancer_FactSheet_2010.pdf
National Science Foundation Polar Program UV Monitoring Network:
http://uv.biospherical.com/student/page3.html
University of California, School of Medicine:
http://www.dermatology.ucsf.edu/skincancer/General/prevention/UV_Radiation.aspx
U. S. Environmental Protection Agency:
http://www.epa.gov/sunwise/doc/uvradiation.html

Toxoplasmosis

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Toxoplasma gondii is a parasitic protozoan that causes toxoplasmosis in warm blooded animals. One of the most common parasitic infections, the CDC estimates that over 60 million people in the United States may be infected with *T. gondii*. Most humans and cats with infection will never show symptoms. Clinical disease may develop if the immune system is suppressed, including pregnant women. The disease can cause severe consequences in immune suppressed and in congenital transmission.

The life cycle of *T. gondii* involves a definitive (long-term) and intermediate host. Cats and other felines are the only definitive hosts. The parasite can only produce oocysts when infecting the definitive host. When a cat ingests contaminated food the parasite is released into the digestive tract where it multiplies and produces oocysts. The oocysts are excreted in large quantities in the cat's feces. Shedding usually occurs 3-10 days after consumption and lasts for around 10-14 days. Intermediate hosts, including other animals and humans, become infected by ingesting sporulated oocysts. The parasite cannot reproduce in the intermediate host. The infection results in cysts formed in the tissues. The tissue cysts remain in the host for life.

Infection occurs from three main routes of transmission: foodborne, zoonotic, and congenital. Rarely transmission can occur from blood transfusions, organ transplants, and handling contaminated blood products. Food borne transmission occurs when people eat undercooked contaminated meat, not washing hands properly when handling uncooked contaminated meat, eating food that came in contact with contaminated utensils and contact surfaces. Zoonotic transmission can occur via the fecal- oral route. People can become infected after cleaning a cat's litter box if the cat is shedding the parasite and proper hand washing is not completed. Infection can also occur from not washing hands after working in the garden if the soil is contaminated and not properly washing fruits and vegetables that may have been in contact with contaminated soil. Contaminated water and unpasteurized dairy products can also be sources. Congenital transmission occurs when a woman becomes newly infected in the first months of pregnancy. Infections

acquired in the beginning of the pregnancy can be more severe for the unborn child than acquired later term. Effects on the fetus can include: premature birth, low birth weight, abnormalities of the retina, mental retardation, abnormal head size, brain calcification, and death or miscarriage.

Most people, including pregnant women, are not aware they have been infected. Typical, mild symptoms that may occur are flulike, such as swollen lymph nodes and muscle aches and pains that last a few days to a few weeks. Congenitally infected children may have no symptoms at birth but may develop symptoms later. Symptoms that may occur are loss of vision, mental retardation, loss of hearing, convulsions, and death. Symptoms in individuals that are immune suppressed may be enlarged lymph nodes, ocular disease, central nervous system disturbances, infection of the brain, and death.

Diagnosis is usually made by serologic testing. The parasite can also be isolated in cerebrospinal fluid, blood, tissue specimens, and can be detected using polymerase chain reaction (PCR). Healthy people do not usually require treatment. Treatment is available for pregnant women, newborns, infants, and the immune compromised but does not totally eliminate *T. gondii*. The U.S. Food and Drug Administration estimates that 85% of pregnant women are at risk. Annually the parasite infects 400-4000 fetuses and causes approximately 80 infant deaths. According to the CDC, toxoplasmosis is a leading cause of death in the United States attributed to foodborne illness. Studies have found that the parasite can cause behavioral changes in rats and even in humans. Currently in the U.S, there is not a vaccine available for toxoplasmosis although one is available in Great Britain to immunize sheep.

Using good sanitation and food safety can prevent toxoplasmosis. The following measures from Cornell Feline Health Center can be used to prevent exposure to *T. gondii*:

- Do not eat raw or undercooked meat. Meat should be cooked to a temperature of at least 145°F to 180°F for 20 minutes depends on the type of the meat minutes.
- Do not consume unpasteurized dairy products.
- Do not eat unwashed fruits and vegetables.
- Wash hands and food preparation surfaces with warm soapy water after handling raw meat.
- Wear gloves when gardening. Wash hands after gardening.
- Wash hands before eating (especially children).
- Keep children's sandboxes covered.
- Do not drink untreated water.
- Do not feed raw meat, undercooked meat, or unpasteurized milk to cats. Do not allow cats to hunt or roam.
- Do not allow cats to use a garden or children's play area as their litter box.
- Remove feces from the litter box daily and clean with boiling or scalding water.
- Pregnant women, and persons with suppressed immune systems, should not clean the litter box.
- Control rodent populations and other potential intermediate hosts.

References:
http://www.fda.gov/Food/ResourcesForYou/HealthEducators/ucm096203.htm
http://www.vet.cornell.edu/fhc/brochures/toxo.html
http://www.cdc.gov/parasites/toxoplasmosis/
http://bioweb.uwlax.edu/bio203/s2008/parks_chri/index.htm
http://www.ars.usda.gov/Main/docs.htm?docid=11013#part3
http://www.cdc.gov/ncidod/eid/vol9no11/03-0143.htm
http://discovermagazine.com/2007/feb/toxoplasma-gondii-culture-sex-ratio

Coccidioidomycosis

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Field Epidemiologist, District 3

Coccidioidomycosis is also known as valley fever. It is a fungal infection caused by the spores of *Coccidioides immitis*. Coccidioidomycosis became nationally notifiable in 2011.

The infection is caused by inhaling fungal spores that become airborne when contaminated soil is disturbed. It is endemic in semi-arid regions such as the southwestern United States, Mexico, and South America. The disease is mainly obtained by people who live in or visit the regions where the fungal spores are prevalent. Coccidioidomycosis is not transmitted person to person. Approximately 10-50% of the people who live in these endemic areas have evidence of exposure to the fungal spores. Most people who have the infection are asymptomatic.

The three forms of coccidioidomycosis are acute, chronic, and disseminated. Acute pulmonary generally has no or few symptoms and will resolve on its own. The incubation period is 7-21 days. Chronic pulmonary can develop after a latency period of 20 or more years with no symptoms. Coccidioidomycosis can cause lung abscesses that rupture and fill the lungs with fluid. Disseminated coccidioidomycosis spreads to other parts of the body which includes the brain, skin, bones and heart. Some symptoms are difficulty breathing, loss of appetite, weight loss, joint pain, night sweats and fever.

The acute disease usually does not need to be treated. The body's own immune system will typically resolve the disease. Chronic and disseminated disease is treated with azoles such as fluconazole, amphotericin B, itraconazole or ketoconazole.

Prevention is difficult since the fungus is airborne and microscopic. Reducing exposure to airborne dust and where the fungus can be found will help in prevention of the disease. While Coccidioidomycosis is not found in Indiana, travelers to endemic areas should be aware of this condition and the signs and symptoms of infection.

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 April 30, 2011 **based on 2000 population of 6,080,485)**

HIV - without AIDS to date:

316	New HIV cases from May 2010 thru April 30, 2011	12-month incidence	5.19 cases/100,000
4,482	Total HIV-positive, alive and without AIDS on April 30, 2011	Point prevalence	73.71 cases/100,000

AIDS cases to date:

326	New AIDS cases from May 2010 thru April 30, 2011	12-month incidence	5.36 cases/100,000
5,437	Total AIDS cases, alive on April 30, 2011	Point prevalence	89.42 cases/100,000
11,198	Total AIDS cases, cumulative (alive and dead) on April 30, 2011		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in March – April *MMWR* Weeks 9-17		Cases Reported in January - April *MMWR* Weeks 1-17	
	2010	2011	2010	2011
Campylobacteriosis	95	80	176	153
Chlamydia	2899	4456	5045	9137
Cryptococcus	4	10	7	14
Cryptosporidiosis	49	14	80	38
E. coli, shiga toxin-producing	4	7	7	11
Giardiasis	54	47	115	89
Gonorrhea	784	1052	1451	2200
Haemophilus influenzae, invasive	20	25	35	36
Hemolytic Uremic Syndrome (HUS)	0	1	0	1
Hepatitis A	7	2	9	8
Hepatitis B	15	8	27	14
Hepatitis C Acute	6	22	9	37
Histoplasmosis	18	23	34	41
Influenza Deaths (all ages)	1	8	2	24
Legionellosis	5	6	10	11
Listeriosis	2	1	3	1
Lyme Disease	5	2	11	2
Measles	0	0	0	0
Meningococcal, invasive	5	6	12	8
Mumps	0	0	2	0
Pertussis	86	22	126	86
Rocky Mountain Spotted Fever	0	0	0	0
Salmonellosis	89	67	144	106
Shigellosis	12	13	17	24

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in March – April *MMWR* Weeks 9-17		Cases Reported in January - April *MMWR* Weeks 1-17	
	2010	2011	2010	2011
Severe *Staphylococcous aureus* in Previously Healthy Person	6	4	10	6
Group A Streptococcus, invasive	25	44	53	90
Group B, Streptococcus, Invasive (All ages)	51	38	109	94
Streptococcus pneumoniae (invasive, all ages)	196	192	345	327
Streptococcus pneumoniae (invasive, drug resistant)	59	51	110	89
Streptococcus pneumoniae (invasive, <5 years of age)	14	13	28	19
Syphilis (Primary and Secondary)	32	24	35	51
Tuberculosis	15	17	22	26
Vibriosis	2	1	3	1
Varicella	53	11	119	39
Yersiniosis	3	1	4	1
Animal Rabies	0	0	0	0

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

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