

{Review of Animal Rabies in Oklahoma, 2007}

The number of rabid animals in Oklahoma during 2007 increased slightly with a total of 78 confirmed cases compared to 69 cases in 2006. Animal rabies activity in Oklahoma tends to follow a cyclical trend with increases or activity peaks occurring approximately every six to eight years. The most recent peak was in 2003 when 204 animals were identified as rabid by laboratory testing. Animal rabies incidence steadily declined since that time until the slight increase in 2007.

When an animal tests positive for rabies or the result is inconclusive, an epidemiologist in the Acute Disease Service (ADS) of the Oklahoma State Department of Health (OSDH) initiates a thorough investigation of potentially exposed animals and humans. Recommendations for human post exposure prophylaxis (PEP) and/or requirements for animal quarantine or euthanasia are made based upon the findings of the investigation. In 2007, 117 animals and 25 humans were deemed exposed to rabid animals. Exposure to rabies virus usually results from the bite of a rabid animal, but may also occur by mucous membrane or broken skin contact with the rabid animal's neural tissue, cerebrospinal fluid or saliva. Of the exposed animals, 35 (30%) were properly vaccinated and therefore required to receive a booster dose of the rabies vaccine along with a 45-day observation period on the owner's property. Of the 82 exposed pets that were not currently vaccinated, owners of 21 (26%) elected placement in a six-month quarantine under the supervision of a licensed veterinarian, and owners of 61 (74%) chose to have the animal euthanized. All persons who are assessed as having potential exposure to rabies are advised to seek rabies PEP through a health care provider. In the spring 2007 edition of the Epi Bulletin, an article outlining the PEP recommendations following an animal bite was published. The article is available on the OSDH ADS Website.¹ Consultation regarding the PEP series is also available by contacting the Epidemiologist-on-Call at 405.271.4060.

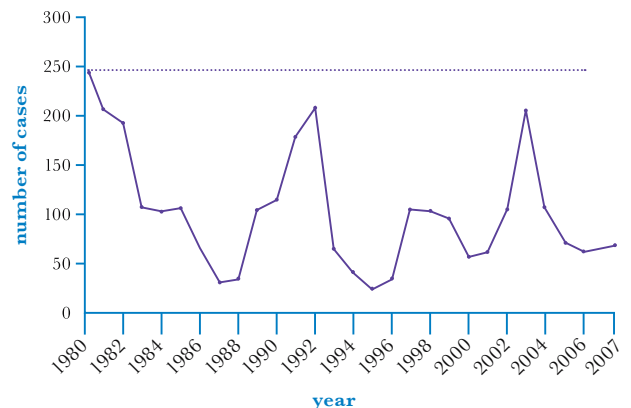
The OSDH Public Health Laboratory (PHL) tested a total of 1,399 animals for rabies in 2007. Of these, 1,297 (92.7%) were negative, 26 had unsatisfactory results due to a crushed or decomposed head, and the remaining 76² were positive for rabies. In Oklahoma, skunks historically have been more likely to test positive for rabies. Of 76 skunks tested in 2007, 73.7% (57) tested positive. In contrast, only four of 596 dogs (0.67%), three of 458 cats (0.66%), four of 53 bats (7.55%), seven of 58 cattle (12.07%), and two of 14 goats (14.29%) tested positive for rabies. In the event that an animal is suspected to be rabid, the OSDH PHL is the only lab in the state of Oklahoma with the capability of testing the animal. For questions regarding testing, please consult the OSDH PHL at 405.271.5070.

*prepared by Jeannie Thompson, MPH, Epidemiologist, ADS

¹ www.ok.gov/health/documents/SPRING%20EPI%202007%20WEB.pdf

² Two rabies cases in 2007 were tested at an out-of-state laboratory.

Number of Confirmed Animal Rabies Cases in Oklahoma, 1980-2007



{Pertussis Epidemiology, Oklahoma, 2000-2007}

Bordetella pertussis is the causative agent for pertussis or “whooping cough.” Children under 1 year of age are disproportionately affected with severe disease. Immunity to pertussis wanes approximately 5-10 years after completion of the primary childhood series, leaving adults and adolescents susceptible to pertussis.¹ In Oklahoma, persons age 1 year or older account for almost 75% of cases annually; however, children under 1 have the highest rate of disease (see graph).

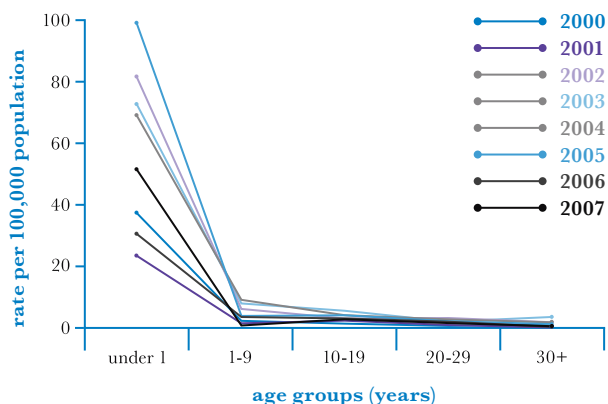
Pertussis is an upper respiratory infection with clinical presentation ranging from mild to severe depending upon host characteristics and age. The most common symptom is a prolonged cough lasting weeks to months. Other classic symptoms of pertussis include paroxysms (coughing fits), vomiting after paroxysms, and an inspiratory whoop. Infants <12 months are more likely to suffer from severe pertussis and pertussis-related deaths than adolescents and adults, accounting for 19% of pertussis cases and 92% of pertussis deaths in the United States during 2000-2004.¹ Pertussis is spread through respiratory droplets generated by sneezing or coughing, and patients are most infectious immediately after cough onset. Infectiousness diminishes over time and is negligible 21 days after onset of cough.

Between 2000 and 2007, a total of 714 cases of pertussis were reported to the OSDH. The median age was 9 years old, ranging from 1 day to 103 years. Approximately 28% of cases were hospitalized, with paroxysms and post-tussive vomiting the most common symptoms. Duration of cough ranged from 3 to 124 days, the median cough was approximately 33 days.

Between 2000 and 2007, infants and children under 1 year constitute 31% of cases annually in Oklahoma, 92% of these being children less than 6 months of age. Those children under 1 year comprised 75% of the total hospitalizations due to pertussis, and the most common symptoms were paroxysmal cough, post-tussive vomiting and apnea. Five children less than 6 months of age died of pertussis between 2000 and 2007.

A definitive diagnosis of pertussis infection is made by culture or polymerase chain reaction (PCR). Direct fluorescent antibody (DFA) has low sensitivity and specificity and is no longer recommended. Serology is not a confirmatory method for pertussis since it is not standardized, and is not recommended for testing of acute infection. A nasopharyngeal swab as soon as possible after cough onset is used for specimen collection and both culture and PCR should be requested.

Pertussis Rate by Age Category, by Year, Oklahoma 2000-2007



The adolescent vaccine Tdap was introduced in 2005, and is currently recommended to replace one booster dose of Td. It is especially important for those persons who reside in a household or may have contact with persons at highest risk for developing complications from pertussis, such as young children. The purpose of the adult and adolescent vaccine is to protect the vaccinated adult against pertussis and to reduce the reservoir of pertussis. Because both the childhood and adolescent vaccines are not 100% effective in preventing disease, antibiotic prophylaxis should be given despite vaccination status to close contacts of a confirmed case of pertussis.

Despite pertussis vaccine coverage, it is important to remember that pertussis still occurs and causes severe illness in Oklahoma children. Physicians should consider a diagnosis of pertussis in patients presenting with prolonged cough and paroxysms despite history of vaccination or disease. Unlike other upper respiratory infections, fever is usually minimal or absent in a case of pertussis. Children who present with symptoms of apnea and cough with absence of fever should be tested for pertussis, especially if a household member has been coughing. If pertussis is suspected, cases should be reported to the Epidemiologist-on-Call at 405.271.4060 so that public health can commence a contact investigation.

*prepared by Jolianne Stone, MPH, Epidemiologist, ADS

¹ CDC. Preventing Tetanus, Diphtheria, and Pertussis Among Adults: Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine. MMWR 2006;55(No. RR-17).

{Disruption in Hib Vaccine Supply and Recommended Vaccination Schedule}

On December 17, 2007, Merck and Co. Inc. voluntarily recalled certain lots of PedvaxHIB® and Comvax (Hib®/HepB combined) and suspended production of these two vaccines until at least October 2008. This recall and suspension has caused a short supply of Hib vaccine and will require changes in Hib vaccination practices. A majority of providers whose previous preference was either PedvaxHIB or Comvax will need to use Sanofi’s ActHIB to complete the primary Hib series. At this time, the Centers for Disease Control and Prevention (CDC) has indicated that available supplies of ActHIB will be insufficient to meet national needs.

The Advisory Committee on Immunization Practices (ACIP) has issued interim guidelines on Hib vaccination during the shortage that include deferring administration of the booster dose due at age 12-15 months, except for children with the following conditions, or children in the specified high-risk groups:

- Asplenia
- Sickle cell disease
- Human immunodeficiency virus infection
- Certain other immunodeficiency syndromes and malignant neoplasms
- American Indian
- Alaskan Native children

Due to the limited availability of Hib vaccine it is very important to avoid giving extra doses of Hib vaccine. Extra doses of Hib vaccine are often given to children who have received PedvaxHib or Comvax for the first two doses at 2 and 4 months of age. These children do not need a dose of Hib vaccine at 6 months of age. They would normally receive a booster dose at 12–15 months of age, however during the shortage this dose will be deferred. Children who received Comvax at 2 and 4 months will still need a 3rd dose of Hep B vaccine. The 3rd dose of Hep B vaccine may be given at 6 months. All licensed Hib vaccines may be used interchangeably. A series that includes vaccine of more than one type will induce a protective antibody level.

Disruption in Hib Vaccine Supply and Recommended Vaccination Schedule

Hib schedule	primary series			booster	total doses	
	2 months	4 months	6 months	12-15 months	routine schedule	booster deferred
All PedvaxHib	PedvaxHib	PedvaxHib	none needed	PedvaxHib	3	2
All Comvax	Comvax	Comvax	none needed	Comvax	3	2 Hib, give 3rd Hep B
All ActHib	ActHib	ActHib	ActHib	ActHib	4	3
If type of Hib vaccine is unknown	unknown type of Hib	unknown type of Hib	ActHib or PedvaxHib	ActHib or PedvaxHib	4	3
If both ActHib and PedvaxHib are used	PedvaxHib	ActHib	ActHib or PedvaxHib	ActHib, PedvaxHib, or TriHIBit	4	3
	ActHib	PedvaxHib	ActHib or PedvaxHib	ActHib, PedvaxHib, or TriHIBit	4	3

{Norovirus: Background and Recommendations to Control Spread}

Noroviruses (genus *Norovirus*, family *Caliciviridae*) are a group of related, single-stranded RNA, non-enveloped viruses that cause acute gastroenteritis in humans. Norovirus remains the most common cause of epidemic gastroenteritis in the U.S., causing an estimated 23 million cases each year.¹ The virus is spread from person to person, contaminated food and water, and through hand transfer of the virus to the oral mucosa via contact with materials, fomites, and environmental surfaces that have been contaminated with either feces or vomitus. Symptoms typically last less than 48 hours and include diarrhea, vomiting, and low-grade fever.

Norovirus is not a reportable disease in Oklahoma, however, suspected outbreaks of norovirus should be reported to the OSDH ADS Epidemiologist-on-Call at 405.271.4060 for investigation. Epidemiologists collaborate with local county health department staff to determine the etiologic agent by collecting specimens for the OSDH PHL, determine the magnitude of the outbreak, identify the source and institute control measures to prevent spread. Norovirus has been increasingly implicated in institutional outbreaks, especially long-term care facilities both in the U.S. and Oklahoma, with peak incidence occurring during winter months. To control the spread of norovirus in long-term care facilities and similar institutions, OSDH recommends the following measures:

Infection Control

- Patients with suspected norovirus infection should be managed with standard precautions with careful attention to hand-hygiene practices.
- Diapered or incontinent persons should be managed with contact precautions.
- During outbreaks, cohort symptomatic patients or isolate them to their rooms.
- Exclude symptomatic patients from group activities and common rooms (including the dining room) until symptoms have subsided.

Environmental Disinfection

-For surfaces that are potentially contaminated, but not visibly soiled, disinfect by vigorously wiping with a solution of 1:10 to 1:50 concentration of household bleach in water.

Note: 1:10 concentration is caustic and should only be used on surfaces that are corrosion resistant.

-When cleaning surfaces that are visibly soiled with feces or vomitus, masks and gloves should be worn.

- 1 A disposable towel soaked in dilute detergent should be used to wipe the surface for > 10 seconds.
- 2 A 1:10 household bleach solution should be applied for > 1 minute.
- 3 Dispose of towel appropriately as it may contain virus.

Note: A list of cleaning products other than bleach effective against norovirus approved by the Environmental Protection Agency is available at <<www.epa.gov/oppad001/list_g_norovirus.pdf>>.

Laundry Concerns

-Do not shake soiled linens and laundry. Soiled linens should be placed directly into a bag at the point of removal.

-Wash with detergent in hot water $\geq 160^{\circ}$ F for ≥ 25 minutes.

Hand Hygiene

-All employees should wash hands frequently with warm running water and soap for at least 20 seconds, especially after performing patient-care duties, using the toilet, changing diapers, and before eating or preparing foods. Alcohol-based sanitizers can also be used when hands are not visibly soiled.

Additional information about norovirus and recommendations to control norovirus outbreaks in institutional settings can be found on the ADS Website at <<ads.health.ok.gov>>.

*prepared by Carmen Clarke, MPH, Epidemiologist, ADS

¹ Mead PS, Slutsker L, Dietz V, et al. Food-related illness and death in the U.S. *Emerg Infect Dis* 1999;5:607--25.

Prevent Infectious Diseases Daily With Healthy Behavior

Clean Your Hands Often

Use soap and water if hands are visibly soiled, otherwise it's okay to use an alcohol based hand gel. Important times to clean your hands are:

- After using the bathroom
- Before preparing or eating food
- After changing a diaper
- After blowing your nose, sneezing, or coughing
- After caring for a sick person
- After touching an animal

Prevent Spreading Germs to Others

- Cover your mouth or nose with a tissue when you cough or sneeze. Immediately put used tissue in the waste basket, then clean your hands.
- If a tissue isn't available, use your upper sleeve to cover your cough or sneeze.
- When you cough or sneeze into your hands, clean your hands immediately. Otherwise you will spread germs to everything and everyone you touch.
- Stay at home when you are sick. Going to work or school spreads germs to others and may prolong the duration of an illness. Avoid any unnecessary exposure to high-risk individuals, such as those in hospitals, nursing homes, or persons with compromised immune systems.

Keep Immunizations Up-to-Date

- Follow recommended immunization schedules for children and adults.
- Remember to get the influenza

("flu") shot every year.

- Also remember to keep your pets current on their immunizations.

Prepare/Handle Food Safely

- Wash hands before and after handling food.
- Keep hot food hot and cold food cold until cooked or eaten.
- Be sure temperature controls in refrigerators and freezers are working properly. Your refrigerator should be 40° F or lower and your freezer should be 0° F to prevent bacterial growth.
- Wash counters, cutting boards, and utensils well with soap and hot water, especially after preparing eggs, poultry, or other meats.
- Use a separate cutting board for raw meat products and ready-to-eat foods such as fresh fruits and vegetables.
- Wash fresh fruits and vegetables before slicing or eating. Cook meat, poultry, and eggs thoroughly. Using a meat thermometer is the best way to ensure that food is properly cooked. Poultry should be at least 165°, red meat should be at least 145° unless it is ground beef, which should be 160° and not pink.
- Refrigerate leftovers as soon as possible after meals.

Care for Your Skin & Wounds Properly

- Clean all wounds and surrounding skin with mild soap and gently rinse with water.
- Cover all wounds with a bandage

and replace if it becomes loose, wet, or soaked with drainage.

- Contact your healthcare professionals if a wound does not heal, or if other symptoms occur.

Use Antibiotics Appropriately

- Antibiotics only work for bacterial illnesses. Illnesses caused by viruses should be treated with over-the-counter medication to relieve symptoms (for example, antibiotics will not shorten the duration of a cold).
- When prescribed, follow the prescription exactly. Always finish the course of treatment, even if you feel better before you are finished with the prescription.
- Avoid taking old, unfinished antibiotics or sharing prescription medication with family or friends.
- Report to your doctor any illness that does not get better after taking a course of prescribed antibiotics.

Be Careful Around All Wild Animals & Domestic Animals Unfamiliar to You

- After any animal bite, cleanse the wound with soap and water and consult with a clinician for further evaluation.
- If you have been bitten, the biting animal will need to be evaluated for disease. Get as much information as you can about the animal. Your animal control officer or local law enforcement can help you. If you have to detain the animal yourself, be very careful to avoid further exposure.
- Enjoy wild animals with your eyes, not by touching them.

Prevent Tick & Mosquito Bites

- Use repellants on skin and clothing according to directions when you will be outside during warm weather.
- Limit your time outside during high risk times for mosquitoes, such as dusk and dawn.
- Wear light-colored clothing to detect crawling insects before they attach.
- Check yourself for ticks as soon as possible after being in wooded or grassy areas.
- Remove ticks safely by using tweezers to pull straight out of the skin. Use of irritants such as a match or fingernail polish remover can cause the tick to expel disease-causing material into your body.
- After removing a tick, do not crush it. Crushing will release bacteria that can then infect you.
- If you become ill with fever 3-21 days after an insect bite or after being in a wooded or grassy area, contact your doctor. Provide the details about your recent activities and the recent tick/mosquito bite in order to help diagnose both rare and common illnesses more quickly.

Stay Alert to Disease Threats When Traveling to or Visiting Underdeveloped Countries

- Get all recommended traveler's immunizations in plenty of time before your trip.
- Use recommended protective medications for travel. Some medications need to be started before you travel.

-Don't drink untreated water, especially while hiking or camping. Bring bottled water to avoid dehydration.

-If you become ill after you return home, tell your doctor where you've been.

Protect Yourself From Sexually Transmitted Diseases

- Not having sex is the best way to avoid getting an STD.
- If you do have sex, use a latex condom. If you are allergic to latex, use a polyurethane condom.
- You can get an STD by having anal, oral or vaginal sex with an infected partner.
- Talk to your partner about past sex partners and about drug use using needles. If anything about your partner worries you, don't have sex!
- Know the signs and symptoms of STD. If you are at risk or if you have symptoms, get checked. Testing is available at your private doctor's office or at your local county health department.

Protect Yourself From Diseases Transmitted Through Blood

- Avoid participating in injection drug use. If you do inject drugs, never share needles.
- Avoid sharing personal care items, such as nail clippers, razors or toothbrushes.
- If you get a tattoo, be sure to get one from an OSDH licensed tattoo artist or establishment.
- Protect yourself from direct contact with blood by using personal protective equipment such as gloves when handling contaminated items.

OSDH Web Resources

The OSDH launched a new Website located at <<www.ok.gov/health>>. The Acute Disease Service Website was launched on the World Wide Web along with the redesigned OSDH Website. The ADS Website consists of a main page and five major sections: Disease Information, Disease Reporting, Publications and Statistics, Current Disease Topics, and a listing of ADS Staff.

The Disease Reporting section shows a listing of reportable diseases for healthcare professionals and laboratories along with contact information. Also included are printer friendly versions of the Oklahoma reportable diseases rules, disease reporting cards, and posters listing the notifiable conditions. The Disease Information section is the most comprehensive section with an alphabetized listing of communicable diseases as well as information available in several categories such as disease prevention, traveler's health, tickborne diseases, respiratory diseases, foodborne diseases, waterborne diseases, and rash illnesses. Each disease-specific page includes a summary, acute disease resources such as fact sheets and prevention recommendations, statistics and surveillance summaries (for reportable diseases), and links to external resources. The Publications and Statistics section indexes past and present reportable disease statistics, published annual summaries, and epidemiology bulletins. The ADS Website can be accessed directly at <<<http://ads.health.ok.gov>>>.

{Outbreak of *Vibrio Cholerae* Associated With Travelers to Cambodia}

Cholera is an enteric disease caused by the bacteria *Vibrio cholerae*. Cholera is an immediately notifiable disease in Oklahoma. When cases or positive laboratory results are reported, an epidemiologist from the ADS conducts a thorough investigation of each report to compile history, symptoms, laboratory test results, and exposure data. Contacts to a case of cholera are identified and control measures are implemented to prevent transmission to others.

On Wednesday, October 24, 2007, ADS received notification from an Oklahoma City hospital laboratory regarding a case of *Vibrio cholerae*. The patient presented to the Emergency Department on October 20th with a three-day history of profuse, watery diarrhea. The patient was rehydrated and released. *Vibrio cholerae* was isolated from a stool specimen collected by the hospital.

An investigation was immediately initiated by ADS. Travel history revealed a recent mission trip to Cambodia from October 14th through 17th with eleven other people from a local church. The case reported additional persons who attended the mission trip became ill with similar symptoms. Exposure history indicated trip participants waded in lake water and consumed raw fruits and vegetables while in Cambodia.

ADS worked with the church and obtained the names and contact information for the 11 other mission trip participants. An interview tool was developed to obtain demographic, symptom, and household contact information from those who attended the trip. ADS and the Cleveland County Health Department worked together to distribute enteric kits for specimen collection and to administer antibiotics to treat symptomatic individuals.

ADS epidemiologists interviewed eleven of the twelve persons who attended the mission trip. Seven persons (64%) reported experiencing a diarrheal illness. All seven agreed to submit a stool specimen; all stool specimens were negative for bacterial culture and isolation conducted by the OSDH PHL. Six persons opted to receive antibiotics. None of the symptomatic mission trip participants and household contacts were associated with a high-risk setting. Seven household contacts were identified with only one who experienced a diarrheal illness. This contact was provided antibiotics for treatment of suspected cholera.

This outbreak investigation highlights the risk of exposure to cholera during international travel to countries where the disease is endemic. Symptoms of cholera consist of profuse, watery diarrhea, nausea and vomiting. Untreated cases may present with severe complications such as severe dehydration, acidosis, circulatory collapse, hypoglycemia in children, and renal failure. In most infections, symptoms can be absent or mild. In severe cases, the death rate can exceed 50%. However, with proper rehydration case fatality is reduced to less than 1%. Infectiousness remains, as long as a stool is positive until a few days after recovery. The bacteria live in fresh or salt water and can cause disease when water comes into contact with an open wound or following ingestion of contaminated food or water. With modern sewage and water treatment systems, cholera is rare in the U.S.

Vibrio cholerae is confirmed by isolating the organism from a stool specimen. Antibiotics can be given to cases and contacts at risk for developing infection to shorten the duration of illness and reduce carriage of bacteria in stool. Physicians should consider cholera in patients with a diarrheal illness with a history of travel to developing countries within 5 days of symptom onset.

*prepared by Christie McDonald, MPH, Epidemiologist, ADS

References

Heymann, David L., Control of Communicable Disease Manual 18th Edition APHA, 2004. Epidemic Viral Gastroenteropathy, pp 227-228.

Summary of Selected Notifiable Disease Reports in Oklahoma

diseases/conditions	winter quarter ¹	year to date ²	5 year average ³
AIDS	23	191	188.6
Campylobacteriosis	95	496	444.4
Chlamydial infections	2518	12038	10599.8
Cryptosporidiosis	24	195	24.8
<i>E.coli</i> O157:H7	2	17	28.2
Ehrlichiosis	2	41	43.6
Giardiasis	36	147	118.6
Gonorrhea	31	174	4497.6
<i>H. influenzae</i> (all types)	17	79	58.8
<i>H. influenzae</i> , type B (kids < 5)	0	0	0
Hepatitis A	3	14	44.4
Hepatitis B (acute)	26	145	88
Hepatitis C (acute)	11	44	9.2
HIV infections	31	174	173.2
Meningococcal invasive	4	22	22
Rabies, animal	10	78	582
Rocky Mountain spotted fever	3	78	140.4
Salmonellosis	187	688	478.8
Shigellosis	43	140	720.8
<i>Streptococcus</i> invasive group A	19	77	73.6
<i>Streptococcus pneumoniae</i> , invasive	25	65	475.6
Syphilis (primary & secondary)	18	62	54.2
Syphilis (early latent)	20	104	71.6
Tuberculosis	26	148	173.8

diseases/conditions	year to date ²	5 year average ³
Brucellosis	1	0.2
Hemolytic Uremic Syndrome (HUS)	1	3.6
Legionellosis	6	11.2
Listeriosis	2	4.4
Lyme disease	0	0.6
Malaria	7	8.6
PAM	0	0.6
Psittacosis	0	0
Tularemia	12	13
Typhoid fever	3	1.2
Vibriosis	1	1.8
Yersiniosis (<i>Yersinia enterocolitica</i>)	3	1.8

number of animal rabies cases by animal type	year to date ²	percent
Bat	4	5.1
Cat	4	5.1
Cow	7	9.0
Dog	4	5.1
Goat	2	2.6
Horse	0	0
Skunk	57	73.1
Total	78	100

¹ 10.01.07 through 12.31.07

² 01.01.07 through 12.31.07

³ Five year average of year to date data for 2002 through 2007.

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