

ZOO NOTIC & VECTOR-BORNE

Public Health Newsletter

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The New York City Department of Health and Mental Hygiene publishes this newsletter to provide local animal health professionals with summaries of recent investigations by the Department, as well as important current events in the field of zoonotic and vector-borne diseases."

The mission of the Zoonotic and Vector-Borne Disease Unit (ZVDU) is the prevention and control of zoonotic and vector-borne diseases in New York City.

Please visit our website at www.nyc.gov/html/doh/html/zoo/zoo.shtml.

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Raccoon Rabies Epizootic on Staten Island and Rabies Update 2006

Rabies in New York City

As of November 1, 2006, 19 raccoons, two skunks, and two cats in Staten Island have tested positive for rabies. The most recent positive animal was identified on October 31st. Rabies in wild terrestrial animals poses a risk to other wild or domestic animals, as well as to humans who may be exposed to rabid animals.

In June 2006, three stray kittens abandoned in the Prince's Bay section of Staten Island were found and cared for by two families, one in Staten Island and one in New Jersey. Two of the cats developed neurologic illness and died. One of these was available for testing and tested positive for rabies. Multiple human exposures occurred, requiring post-exposure prophylaxis for rabies; these included exposures of veterinary staff that had treated the ill animals.

In a second incident, in August, a stray kitten was found in the backyard of a residence in the Huguenot area of Staten Island. The resident picked up the kitten after noticing the pet dog barking at the backyard sandbox. The kitten appeared to be injured with leg paralysis. The resident was bitten on the finger and several individuals who had direct contact with or fed the kitten were treated with rabies prophylaxis. The dog living at the residence in Staten Island had no observed direct contact with the cat and was up-to-date on its rabies vaccination. A booster vaccine was given and the dog was observed by the owner for 45 days.

The current epizootic of terrestrial rabies on Staten Island began in April of 2006, following an extended absence of rabies transmission on the island. From 1997 until early 2006, only one raccoon tested positive for rabies on Staten Island. The map demonstrates the widespread distribution of rabies on Staten Island in 2006. Rabid animals have been found this year in the Bronx (4 raccoons, 1 bat), Manhattan (1 bat) and Queens (2 raccoons) as well. Veterinarians are encouraged to be alert for signs and symptoms of rabies among animals they treat, and to remind New York City pet owners to avoid contact with wild animals and to vaccinate their pets against rabies.

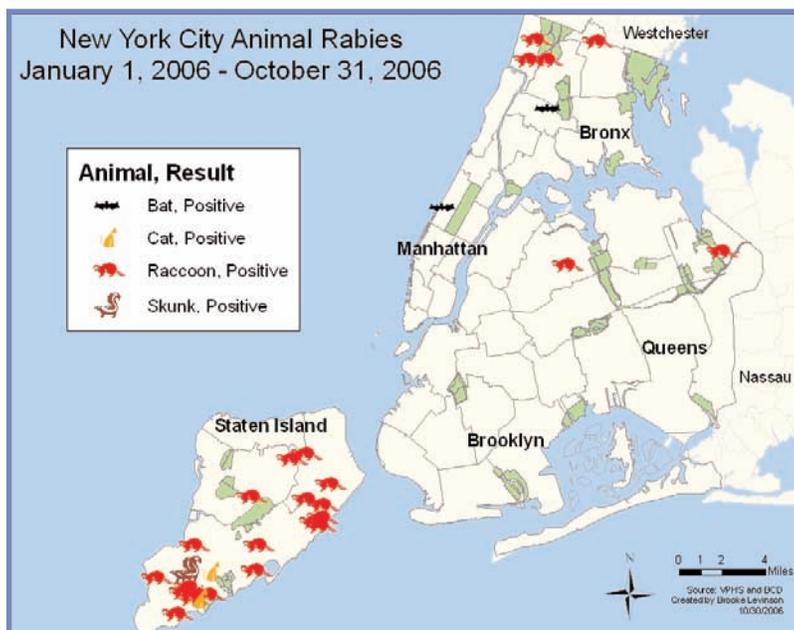
To date in 2006 (January through

September), 607 animals collected in New York City have been tested for rabies. Seventy-seven vector animal species from Staten Island have been tested in 2006 and 21 (27.3%) have been positive. Raccoons make up the plurality of animals tested (n=240) but cats, bats, dogs, opossums and skunks were also tested.

Rabies on Long Island

Nassau County, which borders Queens, has also had a terrestrial rabies epizootic among raccoons since 2004. In 2006, to date, Nassau County has identified 15 positive raccoons and Suffolk county identified 4 rabid raccoons. Through the collaborative efforts of Nassau and Suffolk counties, as well as the New York State Department of Health and the United States Department of Agriculture Wildlife Services, an extensive Oral Rabies Vaccination program was conducted in the fall of 2006 in Nassau and Suffolk Counties, and included a small area in eastern Queens. Since the first identification of raccoon rabies in Nassau County in August of 2004, a total of 61 raccoons have tested positive for rabies (10 in 2004, 36 in 2005 and 15 in 2006). Two raccoons have tested positive in Queens in 2006, and NYC DOHMH continues to conduct enhanced surveillance for raccoon rabies in areas of the City near Long Island. To get the most up-to-date rabies information relevant to New York City visit our website at: www.nyc.gov/html/doh/html/cd/cdrab.shtml.

Contact the NYCDOHMH at 212-788-9830 or call 311 with any questions regarding possible human exposure to rabies. Inquiries about animals exposed to or suspected of having rabies can be directed to Veterinary Public Health Services at 212-676-2483 or to 311.



Texas Boy Dies from Rabies

On May 12th, 2006, a teenager from Houston died after being infected with rabies. He was likely bitten by a rabid bat about one month earlier when he reported waking up after feeling something brush against his arm. When he opened his eyes, he found a bat flying around the bedroom, which he freed after capturing in a towel. No medical care was sought. The first week of May, he developed hypersensitivity to light, sound and movement as well as a fear of swallowing. Upon hospitalization, his condition worsened. Rabies was considered and he tested positive for the virus on ante-mortem testing. Physicians treated him with a therapeutic multi-drug protocol that helped save the life of another teenager who contracted rabies in Wisconsin in 2004. Despite heroic efforts, the boy died. Bat rabies continues to be the primary cause of human rabies in the United States, although it is very rare with only 10 other human cases reported since 1998.

In this case, as with the teenager in Wisconsin, the bat presumed to have transmitted rabies was captured and released. If this bat had been submitted for testing and had been positive, rabies post-exposure prophylaxis (PEP) would likely have been administered and would have prevented the development of rabies. Two important messages to convey to the public are to contact the health department after any possible human exposure to a bat, and to try to capture for testing any bat involved in a known or possible rabies exposure.

The 1999 ACIP [Advisory Committee on Immunization Practices] recommendation on Human Rabies Prevention specifies that: "In all instances of potential human exposures involving bats, the bat in question should be safely collected, if possible, and submitted for rabies diagnosis." Additional information on bat exposures and guidance regarding post-exposure prophylaxis for rabies are available on our website, along with fact sheets for the public and a poster for providers that can be downloaded, at www.nyc.gov/html/doh/html/cdrab/cdrab.shtml.

Avian Influenza Update

Avian Influenza (AI) preparedness remains a priority to the NYC DOHMH as well as federal and international health agencies. The highly pathogenic H5N1 form of avian influenza A (HPAI H5N1) that originated in Hong Kong in 1997 has spread dramatically among domestic poultry and wild birds in Asia, especially since 2003, and more recently in the Middle East, Africa and Europe. Although there have been over 250 human cases, and more than 150 deaths, it is primarily a disease of birds. As of October 2006, the virus is not known to have mutated to a form which is easily transmissible from person to person. If such a mutation were to occur, a pandemic could arise, since this is a novel strain for the human population, with virtually no immunity present among humans across the globe. To date, HPAI H5N1 has not been detected in the western hemisphere.

Birds are considered the most likely route of introduction of the virus to North America. This could occur via a southward movement of migratory birds from Alaska, where birds from Asia intermingle in breeding grounds with migratory birds from North and South America. The detection of HPAI H5N1 in the United States in birds would not indicate the arrival of a pandemic, but most likely the extension of the ongoing avian outbreak to this region of the world. The risk to humans in the US is unknown, but would likely be low, if the transmissibility of the virus is similar to that of the strains currently circulating in other parts of the world. Risk would likely be highest among those who had direct contact with infected wild birds or domestic poultry.

Background on Avian Influenza

AI type A viruses have been found in over 40 species of wild and domestic birds. Avian cases occur every year throughout the world. AI is actually a family of many different strains of influenza viruses; these are classified as either low or high pathogenicity, based upon severity of



disease, as well as genetic sequence and viral effects in cell culture. The virus is shed in the fecal droppings, saliva and nasal discharges of some infected avian wildlife species, and infected domestic poultry. Low pathogenicity AI (LPAI) occurs periodically in the U.S. including New York City and other areas of New York State.

Among the many subtypes of type A avian influenza that have been identified, the H5 and H7 subtypes are associated with HPAI. HPAI usually results in high morbidity/mortality in birds and is considered primarily to be a disease of domestic poultry. The United States Department of Agriculture (USDA), in conjunction with the New York State Department of Agriculture and Markets (NYSDAM), has been designated the lead agency for non-human disease surveillance and control, if and when HPAI is detected in New York State.

Avian Surveillance in the US

USDA, the United States Department of Homeland Security (DHS), and the Department of the Interior (DOI) have collaborated to maintain the highest level of vigilance to protect the poultry industry as well as wild birds in the US and North America. Surveillance includes quarantine and testing of imported live birds, monitoring illegally imported birds, checks on live bird markets, commercial and backyard flocks, and testing of thousands of wild migratory birds.

Recent Findings of Low Pathogenic H5N1

On October 30, 2006 USDA reported that two mallard ducks found in Niagara County tested presumptively positive for LPAI H5N1. Confirmation is pending, but this type of AI is different from the Asian HPAI strain and is not unexpected. LPAI H5N1 is not thought to pose a significant risk to avian populations or to the public. Surveillance of wild birds in North America has identified the H5 and N1 serogroups of AI in several states and in Canada; however, they were also determined not to be the highly pathogenic H5N1 strain.

Human Cases

The overwhelming majority of human cases of HPAI H5N1 have resulted from direct exposure to infected poultry, with a few exceptions. Human-to-human transmission likely occurred in Thailand in 2004. A family cluster has been described, in which an 11 year old girl living in a province died of pneumonia. She was not tested for H5N1 infection, but was considered to be a probable H5N1 fatality after having had contact with sick poultry. Her mother, who lived in Bangkok but visited her daughter to care for her while she was ill, was not known to have any contact with sick poultry, became ill and died, and H5N1 infection was confirmed.

In May 2006, WHO reported an H5N1 influenza cluster in Indonesia involving seven cases of person-to-person transmission; one of the cases involved two generations

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West Nile Virus 2006 Summary

West Nile (WN) virus continues to be the leading cause of epidemic human meningoencephalitis in the United States. WN virus activity for the 2006 mosquito season has ceased in New York City, with the most recent identification of the virus on October 4th. The table below summarizes 2006 mosquito, bird and human WN virus surveillance findings. Most WN virus activity this year was in Staten Island.

Twelve human cases of WN virus were identified this season (8 cases of WN neuroinvasive disease and 4 cases of WN fever) with onset dates between July 18 and September 3.

74 dead birds, found between June 1 and October 4, were found to be infected with WN virus. Among these the most common species were house sparrow (28), American robin (9), house finch (6), blue jay and European starling (5 each). 197 mosquito pools collected between June 27 and September 28 in New York City tested positive for WN virus.

Nationwide, as of October 26, there have been over 3600 human cases, including 1278 neuroinvasive cases and 112 deaths.



2006 WNV Positive Results Summary for New York City

WNV Positive Results	NYC	Bronx	Brooklyn	Manhattan	Queens	Staten Island
Birds	74	2	6	1	15	50
Mosquito Pools	197	9	13	4	35	136
Human West Nile Neuroinvasive Disease (Encephalitis, Meningitis or Acute Flaccid Paralysis)	8	1	0	1	2	4
Human West Nile Fever	4	0	0	0	0	4

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of transmission. Testing of the viruses by the Centers for Disease Control and Prevention (CDC) indicated the virus had not mutated to a form that is easily transmitted from person-to-person.

The risk to people for acquiring HPAI H5N1 through contact with wild birds is not known but is not thought to be high. Contact with wild birds may have been responsible for a cluster of human cases in Azerbaijan. Six cases lived in the same small settlement of Saylan Rayon in south eastern Azerbaijan. A field investigation conducted by the WHO and the Azeri Ministry of Health discovered unburied swan carcasses and suspect that the six victims became infected while collecting swan feathers, a common practice in the community. A retrospective survey of poultry deaths and a seroepidemiologic survey of villagers in Cambodia was recently published. Serologic testing of villagers approximately 2 months after outbreaks in poultry did not demonstrate any recent H5N1 infections, despite close contact with birds likely to have been infected with H5N1. These findings illustrate that H5N1 was not easily transmitted from birds to humans and asymptomatic or mildly symptomatic human infections did not occur.

HPAI H5N1 in Other Species

In March, 2006 German officials and the World Organization for Animal Health reported cats that died of HPAI H5N1 were found on the island of Ruegen. The cats were thought to have ingested birds infected with H5N1. The first reports of any feline infection came in 2004 in a

zoo in Bangkok where tigers were infected with the H5N1 influenza strain. Additionally, a stone marten (a weasel-like animal) found on the same island was infected with H5N1 and thought to have acquired the infection in the same manner. There is no evidence that cats can spread H5N1 to humans.

There are numerous resources available regarding avian influenza. For information that is continuously updated see the following websites:

Centers for Disease Control and Prevention:

www.cdc.gov/flu/avian/

Occupational Safety and Health Administration, Protecting Poultry Workers:

www.osha.gov/dts/shib/shib121304.pdf

World Health Organization:

www.who.int/csr/disease/avian_influenza/en/

World Organization for Animal Health

www.oie.int

NYS Dept of Agriculture and Markets

www.agmkt.state.ny.us/All/AvianFlu.html

NYC DOHMH

www.nyc.gov/html/doh/html/cd/cd-avianflu.shtm

Psittacosis in Wayne County, NY

The New York State Department of Health issued a press release in June 2006 warning people who came in contact with birds from a Wayne County pet store that they may have been exposed to psittacosis. Psittacosis is caused by the bacterium *Chlamydia psittaci*. All birds are susceptible but psittacine birds, such as parakeets, parrots, and cockatiels, and poultry, such as turkeys and ducks, are most commonly associated with human disease transmission. Humans become infected by inhaling the bacteria from dried droppings and secretions of infected birds.

Potential exposure to psittacosis in three family members from cockatiels purchased at the Animal Odyssey Pet Store in Newark, New York was investigated by the state and county health departments. One cockatiel purchased by the family died and another tested positive for psittacosis. The pet store owners obtained the birds from a private breeder and the remaining birds at the store were tested and treated as a precaution. People who had contact with the birds at the pet store since April 2006 were urged to seek medical attention if they developed fever or respiratory illness 1 to 4 weeks after exposure to the birds and to consult a veterinarian for treating their pet birds.

Psittacosis is rarely fatal in humans with antibiotic treatment (preferably tetracycline) but it can cause more severe illness in pregnant women or the elderly. Symptoms in humans are usually fever, headache, rash, myalgia, chills and upper or lower respiratory tract disease. In birds, symptoms of psittacosis include poor appetite, a ruffled appearance, eye or nose discharge, and diarrhea. Tetracycline is also effective in treating



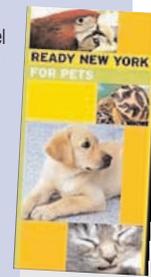
psittacosis in birds. Psittacosis should be considered in the diagnosis for any lethargic bird; some birds may shed the bacteria even if asymptomatic. It can be diagnosed by testing a swab of fecal material.

To prevent the spread of psittacosis, the State Health Department suggests the following precautions for bird owners:

- Clean the cage often so that bird droppings do not accumulate, dry up, and allow the bacteria to become airborne.
- Common disinfectants such as one percent Lysol or bleach solution (one-half cup bleach per gallon of water) can be used for cleaning.
- If cleaning dried bird droppings, moisten the surface before cleaning. This can be done by using a spray bottle filled with water. Avoid using a forceful spray.
- Use disposable gloves and a protective mask while cleaning the cage, to minimize exposure.
- Wash your hands thoroughly after cleaning the cage.

Ready New York For Pets

On September 16, 2006, American Kennel Club Responsible Dog Ownership Day, the New York City Office of Emergency Management (OEM) introduced its new pet preparedness brochure. The "Ready New York for Pets" guide was developed as part of OEM's Ready New York preparedness publication series to help pet owners prepare to care for their pets in case of an emergency. For many people, pets are part of the family and disasters like Hurricane Katrina are a reminder that all household members, including pets, should be considered in emergency planning.



The new brochure encourages pet owners to have a plan that addresses what they will do when an emergency requires them to leave their homes, leave their pet at home, or prevents them from returning home. It also recommends assembling an Emergency Supply Kit that includes food, water, and cleaning supplies, and putting together a Pet Go Bag with the following items:

Pet Go Bag Checklist

- A current color photograph of the owner and pet together (in case they are separated).
- Copies of medical records that indicate dates of vaccinations and a list of medications the pet takes and why.
- Proof of identification and ownership, including copies of registration information, adoption papers, proof of purchase, and microchip information.
- Physical description of the pet, including his/her species, breed, age, sex, color, distinguishing traits, and any other vital information about characteristics and behavior.
- Animal first-aid kit, including flea and tick treatment and other items recommended by the veterinarian.
- Food, water, and dishes for at least three days.
- Collapsible cage or carrier, muzzle and leash, litter pan and scoop, and plastic bags for clean-up.
- Cotton sheet to place over the carrier to help keep the pet calm, and comforting toys or treats.

Ready New York for Pets was created in partnership with OEM's Animal Planning Task Force, which includes representatives from the NYC Department of Health and Mental Hygiene, NYC Department of Parks & Recreation, American Red Cross in Greater New York, American Society for the Prevention of Cruelty to Animals, Animal Care & Control of New York City, Bide-A-Wee, Humane Society of the United States, Mayor's Alliance for NYC's Animals, Pet Industry Joint Advisory Council, Suffolk County Society for the Prevention of Cruelty to Animals, Veterinary Emergency Response Team, and Veterinary Medical Assistance Team One.

The guide is available at www.nyc.gov/html/oem/html/ready/pets_guide.shtm. Copies may also be ordered for veterinary practices by calling 311 (TTY: 212-504-4115).

It is impossible to keep a straight face in the presence of one or more kittens.



—Cynthia E. Varnado

Naturally Occurring Inhalational Anthrax Case in NYC

On February 21, 2006 the New York City Department of Health and Mental Hygiene (DOHMH) was notified of a case of inhalational anthrax in a 44-year-old male resident of Manhattan who made drums from unprocessed cow and goat hides in a storage space in Brooklyn. The investigation by the Bureau of Communicable Diseases revealed that the patient worked with the animal hides obtained both locally and from Africa. The case appeared to be an isolated, naturally occurring infection without evidence of bioterrorism or risk to the general public. In March 2006, the patient was released from the Pennsylvania hospital where he was treated. All environmental locations were cleaned and confirmed as being no longer contaminated. No other cases were identified.

This was the first case of naturally occurring inhalational anthrax in the United States since 1976. Anthrax is a disease caused by exposure to the spore-forming bacterium *Bacillus anthracis*. A spore is a dormant microscopic form of the bacteria that can persist for extended periods in the environment; anthrax spores can be found in soil throughout the world, particularly where livestock are raised. When spores are inhaled or ingested, or when they come into contact with the tissues of animals or humans, they can reactivate and multiply. Spores can

contaminate the fur or hair of an animal without making the animal sick. Anthrax spores can be found worldwide. In the US, states with recognized animal cases include South Dakota, Nebraska, Arkansas, Mississippi, Louisiana, Texas and California.

Anthrax infections associated with the handling of untanned sheep, cattle or goat hides have been reported previously, but are extremely rare and are usually cutaneous. Most previously reported inhalational anthrax cases associated with contaminated animal hides occurred in industrial settings (e.g., goat hair processing mills) before safe work conditions (including proper ventilation) were in place. Human cases of anthrax are reported sporadically among people who manipulate untanned animal hides (e.g., scrape fur off hides with razors) in areas of the world where the disease is enzootic in animals, such as such as parts of Asia, Africa, South and Central America, and Southern and Eastern Europe. One case of cutaneous anthrax was reported in 1974 in association with a goat skin drum which had been imported from Haiti. Information about safe handling practices for animal hides is available on our website at www.nyc.gov/html/doh/html/cd/cd-anthrax-hcp-fs.shtml

Anthrax information for veterinarians in New York City

Household pets are generally resistant to infection with anthrax. In addition, anthrax is not transmitted from per-

son to person or from living animal to animal. Herbivores (livestock animals) are the most susceptible to the disease. The incubation period in animals is the same as humans, on average 3 to 7 days (range 1 to 14 days). Typically, animals are infected with the disease by ingesting organisms from feeding on grass and soil contaminated with spores. The most common presentation of anthrax in animals is sudden death. Other signs and symptoms include fever, lack of rumination, depression, uncoordinated movement, difficulty breathing and convulsions. In some cases, edema and bloody discharge from natural body openings can occur.

Diagnosis is usually made by examination of blood smears from live or dead animals. The body cavity of animals that are suspected to have died from anthrax should not be opened for post-mortem examination. Appropriate disposal of dead animals includes incineration and disinfecting the pen, bedding, stable, and other areas the animal may have contaminated.

As a reminder, by law, certain animal diseases which are communicable to humans and of current public health importance are reportable to DOHMH. Anthrax is reportable if it is suspected in an animal. For a complete list of reportable animal diseases and how to report, see below or go to www.nyc.gov/html/doh/html/zoo/zoo.shtml.

Salmonella Associated with Reptiles and Rodents in Minnesota and Other States

Between December 2005 and January 2006, the Minnesota Department of Public Health received reports of four cases of *Salmonella typhimurium* in school children. An investigation revealed that three out of the four cases attended the same junior high-school. Cultures of environmental samples from a fox snake in one of the school's classrooms as well as three out of seven feed mice yielded *S. typhimurium*. At least one of the feed mice isolates matched the snake's pulse field gel electrophoresis (PFGE) patterns. The Michigan Department of Community Health also found pet snakes positive for *S. typhimurium* although the feed mice tested were negative.

Rodent-associated *Salmonella* infection has been linked to retail pet stores. An alarming number of cases were reported in the Midwest in 2004.¹ Cases, mostly in children, occurred in Kentucky, Georgia, Michigan, Illinois, Missouri, Minnesota, North Carolina, Pennsylvania, and New Jersey and were traced back to a handful of distributors and breeders. These breeders and distributors reported routine use of antibiotics. The organism was resistant to the most commonly used drugs for treatment in human infection. The rodent distribution business lacks regulation standards by local and federal authorities. It is important for pet owners and animal health-care workers to take measures to prevent infection from these animals (see recommendations).

Reptile and rodent associated *Salmonella* infections have occurred all over the US, involving snakes, iguanas, and turtles.² Between 1991 and 2001, reptile ownership in the United States doubled. The increasing number of reptiles in homes increases the chance that people can be infected with reptile-associated *Salmonella*. The organism is usually shed in feces and can survive for prolonged periods of time on surfaces such as cages.

Recommendations for preventing transmission of *Salmonella* from reptiles and rodents to humans

- Pet-store owners, health-care providers, and veterinarians should provide information to owners about the risks for and prevention of salmonellosis from these pets.
- Persons at increased risk for infection or serious complications from salmonellosis (e.g., children aged <5 years and immunocompromised persons) should avoid contact with reptiles and rodents.
- Reptiles should be kept out of households that include young children and immunocompromised persons. A family expecting a baby should remove any pet reptile from the home before the infant arrives.
- Reptiles should not be allowed in childcare centers.
- Persons should always wash their hands thoroughly with soap and water after handling reptiles and rodents or their cages and bedding.
- Reptiles and rodents should not be allowed to roam freely throughout a home or living area.

- Pet reptiles and rodents should be kept out of kitchens and other food-preparation areas. Kitchen sinks should not be used to bathe these pets or clean their cages or dishes. If bathtubs are used for these purposes, they should be cleaned thoroughly and disinfected with bleach.
- These pets should not be kissed or held close to the mouth.

¹ CDC. Outbreak of Multidrug-Resistant *Salmonella* Typhimurium Associated with rodents Purchased at Retail Pet Stores – United States, December 2003–October 2004.

² CDC. Reptile-Associated Salmonellosis – Selected States, 1998–2002. *MMWR* 2003; 49: 1206–1209.



Animal Disease Reporting

As a reminder, the following diseases are reportable by law in NYC by veterinarians, persons in charge of facilities responsible for animal care, and veterinary diagnostic laboratories.

- Upon suspicion: anthrax, brucellosis, glanders, plague, Q fever, tularemia, monkeypox and rabies.
- Upon diagnosis: psittacosis, leptospirosis, and arboviral encephalitis.
- "An outbreak of any disease or condition in birds or animals, of known or unknown etiology, which may pose a danger to public health."

To report to the New York City Department of Health and Mental Hygiene:

1. Call the Bureau of Communicable Disease at 212-788-9830 during regular business hours, and for urgent matters after regular business hours call the Poison Control Center at 212-764-7667.
2. Complete an Animal Disease Report Form (available online at www.nyc.gov/html/doh/downloads/pdf/zoo/zoo-disease-report-form.pdf) and fax to 212-788-4268 or mail to Zoonotic and Vector Borne Disease Unit, Bureau of Communicable Disease, 125 Worth St., Box 22A, New York, NY 10013.