

# 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, Influenza and Vector-Borne Disease Unit (ZIVDU) is the detection, prevention and control of zoonotic, influenza and vectorborne diseases in New York City. Please visit our website at [www.nyc.gov/html/doh/html/zoo/zoo.shtml](http://www.nyc.gov/html/doh/html/zoo/zoo.shtml).

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## Raccoon Rabies Epizootic in Manhattan



Raccoon rabies has been present in New York City since the virus first appeared in the area in 1992, but has been limited primarily to the Bronx and Staten Island. In December 2009, Manhattan began experiencing a large epizootic of raccoon rabies in and around Central Park. As of May 31, 2010 a total of 114 raccoons in and around Central Park (including 2 each from Morningside and Riverside Parks) have tested positive for rabies since last year. In response, the City convened a Task Force consisting of representatives from local, state and federal agencies and organizations with expertise in rabies management including the United States Department of Agriculture (USDA), New York State Department of Environmental Conservation, New York State Department of Health, New York City Department of Health and Mental Hygiene (NYC DOHMH), NYC Parks and Recreation and the Central Park Conservancy. The group developed a plan consisting of public education, a raccoon vaccination program and enhanced surveillance designed to learn more about the size of the raccoon population, and the extent of the rabies epizootic.

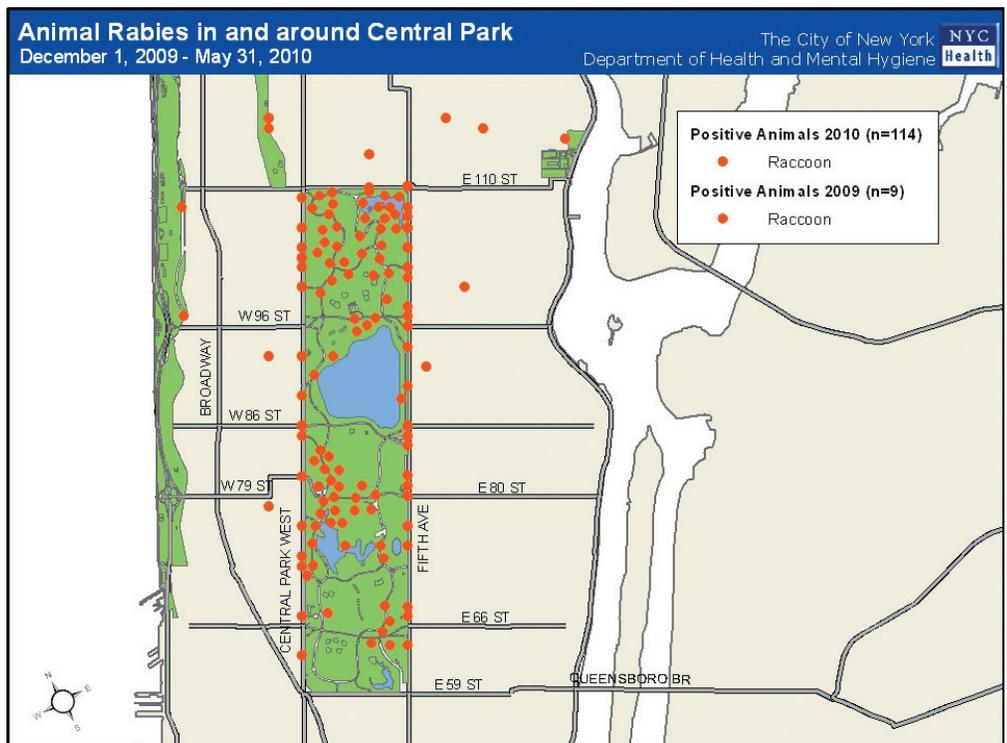
On February 16, 2010, USDA Wildlife Services, in conjunction

with the City's Health and Parks Departments and Central Park Conservancy, began a humane trap, vaccinate and release (TVR) program in and around Central Park, Morningside Park and Riverside Park. Raccoons caught in the humane traps were given a parenteral rabies vaccine, eartagged for identification and then re-released at the trap site.

The TVR program ran for 8 weeks and will be followed by another TVR program in the summer in order to vaccinate the young raccoons born this spring. The traps are placed in areas that are not readily accessible by the public to prevent park visitors and pets from disturbing the cages. There is also contact information posted by the cages in case of an emergency. As of April 9, 2010, the last day of the winter/spring TVR operation, a total of 237 raccoons had been vaccinated, ear-tagged and released.

Raccoons are the most commonly reported rabid animal in New York City. Vaccinating raccoons in the Central Park area against rabies will help protect additional raccoons from rabies infection and prevent further spread of the virus in the city. The TVR program will also help decrease the chance that a person or a pet is bitten by a rabid raccoon. Though these types of occurrences are rare in the city, four people have been bitten or otherwise exposed to rabid or potentially rabid raccoons since the outbreak began in December 2009. All persons received rabies postexposure prophylaxis and are doing fine. In addition, two dogs have been exposed to rabid raccoons. Both were current on their rabies vaccines, treated by veterinarians and are also doing fine.

The Health Department's rabies surveillance reports and information about rabies is available at [www.nyc.gov/health/rabies](http://www.nyc.gov/health/rabies) and updated regularly. ■



# Rabies Pre- and Post-exposure Vaccination and Titer Testing Protocols

The following information has been extracted from the document, "Human Rabies Prevention – United States, 1999 Recommendations of the Advisory Committee on Immunization Practices (ACIP)". This document can be found in its entirety on our website, [www.nyc.gov/health](http://www.nyc.gov/health). Go to Health Topics A–Z, click on "R" for Rabies, and then the link for "Information for Professionals."

## Primary or Pre-exposure Vaccination

Pre-exposure vaccination should be considered for veterinarians and any staff whose activities bring them into frequent contact with rabies virus or potentially rabid bats, raccoons, skunks, cats, dogs, or other species at risk for having rabies.

Pre-exposure prophylaxis is administered for several reasons:

- Simplifies postexposure prophylaxis by eliminating the need for rabies immune globulin (RIG) and decreasing the number of doses of vaccine needed
- Provides possible protection when postexposure therapy is delayed
- Provides possible protection for exposure to rabies, such as a scratch or a bite that goes unrecognized or unreported, when an elevated titer is maintained (see titer testing below)

The New York City Department of Health and Mental Hygiene does not offer rabies vaccine, for either pre- or post-exposure. Persons interested in obtaining pre-exposure vaccination should contact their physician or a travel vaccination

clinic. Persons seeking postexposure vaccination should seek care at an emergency room.

## Titer Testing

Veterinarians and their staff who work directly with animals where animal rabies is enzootic, such as New York City, are considered to have frequent risk for exposure to rabies and should have a serum sample tested for rabies antibody every 2 years. If the titer is less than complete neutralization at a 1:5 serum dilution by the rapid fluorescent focus inhibition test (RFFIT), the person should receive a single booster dose of vaccine.

Rabies titer testing is available through the commercial laboratory Quest Diagnostics® or Kansas State University Rabies Laboratory (KSU). Your provider should collect a serum sample and ship specimens directly to either laboratory (please note that specimens sent to Quest Diagnostics® are forwarded directly to KSU). For more information go to <http://www.vet.ksu.edu/depts/dmp/service/rabies/index.htm> or <http://www.questdiagnostics.com/>.

Persons who are immuno-suppressed may not mount an adequate immune response so should avoid activities for which rabies pre-exposure prophylaxis is indicated. When this is not possible, they should seek advice on how to approach obtaining rabies pre-exposure vaccination from their health care provider or contact the DOHMH Bureau of Communicable Disease for more information.

## Postexposure Therapy for Previously Vaccinated Persons

If exposed to rabies, previously vaccinated persons should receive two intramuscular doses (1.0 mL each) of vaccine, one immediately and one 3 days after the first dose. RIG is unnecessary and should not be administered to these persons because an anamnestic response will follow the administration of a booster regardless of the pre-booster antibody titer.

## Postexposure Prophylaxis for Unvaccinated Persons

In 2009 ACIP approved the recommendation to reduce the number of rabies vaccines used for postexposure prophylaxis (PEP) from 5 doses to 4 doses in persons who are not immunosuppressed and who have not been immunized in the past. A regimen of 4 one-mL vaccine doses of rabies vaccine (HDCV or PCECV) should be administered intramuscularly to previously unvaccinated persons with no immunosuppression. The first dose of the 4-dose course should be administered as soon as possible after exposure. This date is considered day 0 of the PEP series. Additional doses should then be administered on days 3, 7, and 14 after the first vaccination. Considerations for the site of the intramuscular vaccination and recommendations for the use of RIG remain unchanged. ■

## First Rabid Raccoon in Brooklyn

A raccoon collected in Boerum Hill on Feb. 12, 2010 tested positive for rabies, making it the first rabid raccoon reported from Brooklyn since rabies first appeared in NYC in 1992. The raccoon was captured after it was observed pestering a dog through a backyard fence. Previously, 5 rabid bats and a cat had been found in Brooklyn. The cat was found in 2001 on subway tracks and is thought to have come into the borough from elsewhere. Enhanced surveillance in the area will help determine if the rabid raccoon was an isolated incident or if it may represent the movement of raccoon rabies and terrestrial transmission into Brooklyn. ■

## Rabies Pre-exposure Prophylaxis Schedule

Type of vaccination	Route	Regimen
Primary	Intramuscular	HDCV, PCECV, or RVA; 1.0 mL (deltoid area), one each on days 0*, 7, and 21 or 28
Booster	Intramuscular	HDCV, PCECV, or RVA; 1.0 mL (deltoid area), day 0* only

HDCV=human diploid cell vaccine; PCECV=purified chick embryo cell vaccine; RVA=rabies vaccine absorbed.

\*Day 0 is the day the first dose of vaccine is administered.

## Overview for Handling Animals Involved in Potential Rabies Exposure Incidents

Please note, the New York City Health Code, Section 11.66 "Rabies: compulsory vaccination" mandates vaccination of dogs and cats four months of age or older.

### Person bitten or otherwise exposed to a healthy dog, cat, ferret\* or livestock \*\*:

If the owner is available, the owner should observe the biting animal for 10 days and contact the DOHMH Animal Bite Unit at 212-676-2483.

- If the dog, cat, ferret or livestock is alive and healthy after 10 days, owner notifies the DOHMH.
- If dog, cat, ferret or livestock develops neurological symptoms or dies during the 10 day period, immediately notify DOHMH at 212 676 2115 to arrange for rabies testing.
- If the animal's rabies vaccine status is not up to date, do not vaccinate the animal until after the completion of the 10 day observation period.

\*Please note ferrets are illegal in NYC.

\*\*Livestock includes goats, sheep, equine and swine.

\*\*\*Rabies vector species include raccoons, skunks, foxes, coyotes and bats.

If the owner cannot be located or the animal is a stray

- Attempt to make arrangements to have dog, cat, ferret or livestock captured for observation or testing with the DOHMH.

- If the animal is not captured, have person bitten immediately contact their health care provider or the Bureau of Communicable Disease for treatment advice.

Persons bitten do not need to receive rabies postexposure prophylaxis (PEP) if the biting dog, cat, ferret or livestock remains healthy during the 10 day period or tests negative for rabies.

If a biting animal tests positive, rabies PEP is always indicated.

### Person bitten or otherwise exposed to a sick dog, cat, ferret\* or livestock \*\*::

Immediately notify DOHMH at 212 676 2115 to arrange for rabies testing.

- Persons bitten do not need to receive rabies postexposure prophylaxis (PEP) if the biting dog, cat, ferret or livestock tests negative for rabies.

- If a biting animal tests positive, rabies PEP is always indicated.

If the animal is not captured, have person bitten immediately contact their health care provider or the Bureau of Communicable Disease for treatment advice.

### Person bitten or otherwise exposed to a rabies vector species\*\*\*

Immediately notify DOHMH at 212 676 2115 to arrange for rabies testing.

- Persons bitten do not need to receive rabies postexposure prophylaxis (PEP) if the rabies vector species\*\*\* tests negative for rabies.
- If a biting animal tests positive, rabies PEP is always indicated.

If the animal is not captured, rabies PEP is indicated.

### Person bitten or otherwise exposed to any other type of mammal

Have person bitten immediately contact their health care provider or the Bureau of Communicable Disease for treatment advice.

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## 2009 H1N1 Infections in Animals



Human-to-human transmission of the 2009 H1N1 strain of the influenza A virus was first reported in NYC in April 2009 and has since expanded to a global pandemic. This novel influenza virus has been identified by the CDC as a genetic combination of North American swine and avian flu viruses with human and swine flu viruses from Asia and Europe. The outbreak now appears to be on the decline in the U.S. but continues to be closely monitored by health agencies worldwide. The H1N1 virus has also affected several animal species, summarized in Table 1. While most zoonotic diseases can be spread from animals to people, 2009 H1N1 is primarily transmitted from people to animals.

- Most H1N1-infected animals had only mild respiratory illness and fully recovered.
- Cats and ferrets are susceptible to influenza viruses, including H1N1 and H5N1, the avian flu virus.
- Dogs are primarily susceptible to H3N8, the canine flu virus.
- H1N1 has been detected in several commercial swine herds and turkey flocks. *Swine*: U.S., Canada, Argentina, Taiwan, Singapore, Indonesia, United Kingdom, Ireland, Germany, Italy, Denmark, Norway, Finland, Iceland, Australia, Japan; *Turkeys*: U.S., Canada, Chile

Species	Date of Report	State or Country	Clinical Details	Disposition
Cat	11/04/09	IA	Respiratory infection	Recovered
	11/17/09	UT	Difficulty breathing	Recovered
	11/18/09	OR	Labored breathing, pneumonia	Died
	12/04/09	CO	Lower respiratory tract infection	Recovered
	12/08/09	OR	Weakness, sneezing, nasal discharge, history of allergies and chronic sinusitis	Died
	12/08/09	France	Respiratory illness	Recovered
	12/10/09	PA	Lethargy, loss of appetite, pneumonia	Died
	01/15/10	CO	Sneezing, runny nose & eyes; feline herpes virus co-infection	Recovered
Cheetah	12/01/09	CA	Cough, lethargy, loss of appetite; 3 others in private zoo ill	Recovered
Dog	11/25/09	China	Cough, nasal discharge	Recovered
	12/22/09	NY	Cough, lethargy, loss of appetite	Recovered
Ferret	10/09/09	OR	Weakness, sneezing, coughing, fever	Recovered
	10/27/09	OR	Fever, sneezing, coughing, nasal discharge; 3 out of 9 ferrets in home ill	Recovered
	11/23/09	OR	Coughing, sneezing, nasal discharge, inappropriate urination	Recovered
	10/29/09	NE	3 other ill ferrets in home	Died
	12/30/09	NY	1 other ill ferret in home	Recovered

- USDA studies show no risk of acquiring H1N1 from eating pork or poultry from previously infected animals since the virus has only been found in the respiratory tract.
- All H1N1 infections were likely transmitted from person-to-animal: exposure to an owner or household contacts with either H1N1 or influenza-like illness was reported in most of the cases below and suspected in the others.
- To date, there is no evidence that H1N1 has been transmitted from animal-to-person and there appears to be very limited potential for animal-to-animal transmission. ■

### References:

1. American Veterinary Medical Association. 2009 H1N1 Flu Virus Outbreak. Feb 8 2010. Available at [http://www.avma.org/public\\_health/influenza/new\\_virus/default.asp](http://www.avma.org/public_health/influenza/new_virus/default.asp).
2. Oregon Veterinary Medical Association. H1N1 & Animals: 5 Oregon Ferrets Positive for H1N1 Virus. Jan 12 2010. Available at <http://oregonvma.org/news/h1n1>.
3. U.S. Food and Drug Administration. USDA Study Confirms Pork from Pigs Exposed to H1N1 Virus is Safe to Eat. Dec 16 2009. Available at [http://usda.gov/documents/ARS\\_STUDY\\_H1N1\\_Pork\\_12-16-09.pdf](http://usda.gov/documents/ARS_STUDY_H1N1_Pork_12-16-09.pdf).

## Salmonella Associated with Water Frogs

Animal contact is a well-recognized source of salmonellosis in humans. The ubiquitous bacterium has been transmitted to people by reptiles such as turtles and lizards, amphibians, and chicks. Most recently, African dwarf frogs were identified as the culprit in a 2009 multistate outbreak



of *Salmonella* Typhimurium, the first multistate outbreak associated with amphibians. To date, 85 cases with the outbreak strain have been identified in 31 states; none from NYC. African dwarf frogs are an aquatic species commonly sold as ornamental aquarium pets and the implicated frogs likely came from a common breeder in California. Since September 2009, the NYC DOHMH attempts to interview all reported human salmonellosis cases to ascertain possible food, water, and animal exposures. Contact with reptiles or amphibians is rarely reported by interviewed cases (7%). At least 3 cases, 2 with turtle contact and one with lizard contact, were infected with serotypes associated with those reptiles in the past (2,3). However, further testing was not performed on the reptiles to verify whether they were the likely source of *Salmonella* infection.

### Reminders for preventing salmonellosis from pets:

- Educate pet owners on risk of acquiring salmonellosis
- Remind pet owners and especially children to use proper handwashing techniques after handling pets, their habitats, and anything else that comes into contact with pets
- Advise pet owners on proper cleaning of animal habitats ■

### References:

1. Centers for Disease Control and Prevention. Multistate outbreak of human *Salmonella* Typhimurium infections associated with aquatic frogs --- United States, 2009. *MMWR* 2010;58:1433-1436.
2. Centers for Disease Control and Prevention. Turtle-associated salmonellosis in humans --- United States, 2006-2007. *MMWR* 2007;56:649-652.
3. Willis C, Wilson T, Greenwood, M. Pet reptiles associated with a case of salmonellosis in an infant were carrying multiple strains of *Salmonella*. *J Clin Microbiol* 2002;40:4802-4803.

## 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.

- If suspected: anthrax, brucellosis, glanders, plague, Q fever, tularemia, monkeypox, rabies, severe acute respiratory syndrome (SARS), and novel influenza virus with pandemic potential
- If diagnosed: psittacosis, leptospirosis, salmonellosis, tuberculosis, and Rocky Mountain spotted fever
- Any outbreak of any disease or condition that may pose a danger to public health or any unusual manifestation of a disease in an animal

### To report to the Department of Health and Mental Hygiene:

1. Call the Bureau of Communicable Disease at 212-788-9830 during regular business hours. For urgent matters after regular business hours call the Poison Control Center at 212-764-7667 (212-POISONS).
2. Complete an Animal Disease Report Form (available at [www.nyc.gov/html/doh/downloads/pdf/zoo/zoo-disease-report-form.pdf](http://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 Street, CN-22A, New York, NY 10013.

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**Dog, cat, ferret\* or livestock\*\* bitten or otherwise exposed to any rabid animal or rabies vector species\*\*\* that is unavailable for testing or has a bite wound of unknown origin:**

If dog, cat, ferret or livestock is current on rabies vaccination,

- Revaccinate as soon as possible and have the owner observe the animal for 45 days at home.

If dog, cat, ferret or livestock is not current on rabies vaccination,

- Revaccinate and have animal observed at veterinary facility (at owner's expense) for 6 months; otherwise, dog, cat, ferret or livestock must be euthanized.

**All other animals will be considered on a case by case basis by DOHMH.**

### Contact information:

To report animal bites, call 212-676-2483 during business hours.

To contact Veterinary Public Health Services regarding issues related to animal bites, call 212-676-2115.

To contact the Bureau of Communicable Disease regarding human exposures, call 212-788-9830.

After business hours, please call the Poison Control Center at 212-764-7667 (212-POISONS). ■

\*Please note ferrets are illegal in NYC.

\*\*Livestock includes goats, sheep, equine and swine.

\*\*\*Rabies vector species include raccoons, skunks, foxes, coyotes and bats.

## MRSA Transmission Between People and Pets



### Facts

- Methicillin-resistant *Staphylococcus aureus* (MRSA) is resistant to beta lactam antibiotics and most commonly causes skin, soft tissue, and wound infections
- Both people and animals can become colonized with MRSA in their nasal passages or on skin without becoming ill. Pets can also carry MRSA in the intestinal tract and around the anus.
- Colonized pets and people can transmit MRSA to other animals and people through direct contact with infected areas. Although likely rare, pets can transmit MRSA to people and animals during the brief time they are colonized.
- Most pets with MRSA were likely originally colonized by exposure to an infected person.
- **Colonization in pets is usually transient and most, if not all, pets will clear the bacteria in a few weeks without antibiotic treatment.**

### Management Guidelines

- Testing of pets for MRSA carriage should only be considered when there is recurrent MRSA in the household and transmission is ongoing despite the implementation of household infection control measures.
- Testing of pets should only be done as part of an overall investigation of the household. Testing of pets but not human household contacts is not indicated.
- Removal of the pet should only be considered in exceptional circumstances, and removal should be temporary. Such circumstances could include households where controlling contact with the pet is not possible and/or when people in the household are being treated to eliminate MRSA carriage. The beneficial effects of pet contact should be considered in any discussion about removal of the pet from the household.

### Findings from Recent Studies

#### 1. Methicillin-resistant *Staphylococcus aureus* carriage in UK veterinary staff and owners of infected pets: new risk groups by Loeffler et al.

- Veterinary personnel significantly more likely to carry MRSA than pet owners
- Among 608 veterinary staff and pet owners who had contact with pets carrying MRSA, 12.3% of veterinarians and 7.5% of pet owners with MRSA carriage
- MRSA carriage rates higher than in general population
- Findings consistent with other studies but question remains whether those treating MRSA-infected pets are more likely to be colonized because they acquired it from

pet or because they already had MRSA and infected patient

- **MRSA in pets is a human-borne disease.** Pets usually acquire MRSA from a close human contact. Attempts to control MRSA in pets should include human interventions as well.

#### 2. Methicillin-resistant and -susceptible *Staphylococcus aureus* (MSSA) Infections in dogs by Faires et al.

- Most infections caused by both MRSA and MSSA were skin infections.
- **Prior use of antibiotics was associated with development of MRSA**
  - Dogs that received any antibiotic within 90 days were approximately 3.8 times as likely to have MRSA vs. MSSA infection.
  - Dogs treated with fluoroquinolone antibiotics were 4.6 times as likely to have MRSA vs. MSSA infection.

#### 3. Profiling MRSA positive dogs: Results of year-long active surveillance in a veterinary teaching hospital by Balen et al.

- Out of 435 dogs, 5.7% were MRSA carriers. Ownership by people in the veterinary healthcare field was a risk factor for infection. • Dogs owned by people working in the veterinary field were 5.1 times more likely to be MRSA positive. ■

**References:** Arizona Department of Health Services. MRSA Information for Veterinarians. Oct 23 2009. Available at [www.azdhs.gov/phs/oids/epi/disease/mrsa/pdf/AZ%20MRSA%20Information%20for%20Veterinarians.pdf](http://www.azdhs.gov/phs/oids/epi/disease/mrsa/pdf/AZ%20MRSA%20Information%20for%20Veterinarians.pdf).

2. University of Guelph Centre for Public Health & Zoonoses. MRSA for Pet Owners. Sep 28 2008. Available at <http://www.wormsandgermsblog.com/uploads/file/M2%20MRSA%20-%20owner.pdf>.

3. Barton M, Hawkes M et al. Guidelines for the prevention and management of community-associated methicillin-resistant *Staphylococcus aureus*: A perspective for Canadian health care practitioners. *Can J Infect Dis Med Microbiol* 2006;17(Suppl C):4C-24C. Available at [www.wormsandgermsblog.com/Can%20J%20Infect%20Dis%20Med%20Microbiol%202006%20Barton.pdf](http://www.wormsandgermsblog.com/Can%20J%20Infect%20Dis%20Med%20Microbiol%202006%20Barton.pdf).

4. Loeffler, A, Pfeiffer DU, Lloyd, DH, Smith, H, Soares-Magalhaes, R, Lindsay JA. Methicillin-resistant *Staphylococcus aureus* carriage in UK veterinary staff and owners of infected pets: new risk groups. *J Hospital Infection* 2010;74:282-288.

5. Faires, MC, Traverse M, Tater KC, Pearl DL, Weese JS. Methicillin-resistant and -susceptible *Staphylococcus aureus* infections in dogs. *Emerg Infect Dis* 2010;16:69-75. Available at [www.cdc.gov/EID/content/16/1/69.htm](http://www.cdc.gov/EID/content/16/1/69.htm).

5. Ohio State University, Office of International Affairs. 2009. Available at <http://oia.osu.edu/scholar-research-exposition/research-summaries-2009/1059-profiling-mrsa-positive-dogs-results-of-a-year-long-active-surveillance-in-a-veterinary-teaching-hospital.html>