Master of Public Health Field Experience Report

INTERNSHIP AT THE WYANDOTTE COUNTY HEALTH DEPARTMENT

by

EMILY MICHELLE CAVLOVIC
MPH Candidate

submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

Graduate Committee:
Dr. Natalia Cernicchiaro DVM, PhD
Dr. A. Sally Davis DVM, PhD
Dr. Kate KuKanich DVM, PhD, DAVCIM

Field Experience Site:
Unified Government of Wyandotte County and Kansas City, KS Public Health Department
May 31st 2016 to July 15th 2016

Field Experience Preceptor:
Ms. Kari Neill MPH

Kansas State University
Manhattan, Kansas

2016

Copyright

EMILY MICHELLE CAVLOVIC
2016

Keywords: Animal bites, Health Communication, Public Health, Rabies, Wyandotte County

Summary

This report is a summation of my field experience conducted at the Unified Government Public Health Department from May 31st to July 15th, 2016. I specifically worked at the Communicable Disease Control Program I also interacted with other sections of the health department. The main project consisted of increasing the reporting of animal bites in Wyandotte County in order to conduct more accurate and timely rabies surveillance in this County. This involved updating of current animal bite reporting protocols and rabies information, and improving access to the Communicable Disease Control webpage. During this internship, I also conducted projects that focused on increasing communication between the Communicable Disease Control Program and the residents of Wyandotte County. Overall, I learned about how a local public health department operates and strives to better the health of residents in a community.

Table of Contents

List of Figures

Acronyms

CDC - Center for Disease Control and Prevention

ESSENCE - Electronic Surveillance System for the Early Notification of Community-Based Epidemics

HDCV- Human Diploid Cell Vaccine

HRIG - Human Rabies Immunoglobulin

KDHE - Kansas Department of Health and Environment

NNDSS -National Notifiable Disease Surveillance System

NSSP - National Syndromic Surveillance Program

PEP - Post Exposure Prophylaxis

TB - Tuberculosis

Wyco PHD - Wyandotte County Public Health Department

Chapter 1 - Scope of Work

Introduction

The Wyandotte County Public Health Department (Wyco PHD) is located on 619 Ann Avenue in downtown Kansas City, Kansas. Its mission is to "monitor and assess health status indicators to identify community health problems, and promote and encourage healthy lifestyle behaviors". The health department is divided into five main divisions: Air Quality, Emergency Preparedness, Environmental Health, Personal Health Services, and Health Communities (Unified Government, 2014). In 2015, there were 24,811 visits to this health department, serving 12,493 clients (Unified Government 2015). Wyandotte County, KS has a population of 163,369 people, a median household income of $39,326 and a poverty rate of 24%. Wyandotte County is an ethnically diverse county; it is 42.1% Caucasian, 27.7% Hispanic or Latino, 24.3% African-American, 4.1% Asian and 1.3% American Indian or Alaskan Native. Twenty-five percent of county residents who are five years of age or older speak a language other than English at home (US Census Bureau 2015).

Learning Objectives

The objectives for my internship with the Wyandotte County Public Health Department were to 1) learn about the methods, activities and services that a public health department offers to its community; 2) increase my knowledge about rabies prevention and reporting methods; and 3) to increase my knowledge about disease surveillance methods and techniques. The first objective was achieved by interacting with and shadowing individuals from different offices within the health department. Observing staff in the Communicable Disease Control program

provided me with real-world knowledge and insights into the workings of an inner city health department. I participated in public swimming pool inspections with Mr. Jim Baker, an inspector from the Environmental Health division, and Logistics Delivery Systems training conducted by the Emergency Preparedness division. I attended a staff meeting of the leaders of the Healthy Communities Wyandotte program. The second objective was achieved by conducting research on how rabies was reported at both the state and county levels, creating rabies reporting forms that complied with the current KDHE standards, and gathering local police and animal control officer's perceptions about rabies reporting. The third and last objective was achieved by gathering information that will assist the updating of an online syndromic surveillance webpage and assisting with investigations of reportable diseases based on alerts to the health department from local laboratories, hospitals, physicians, and fellow health departments. Diseases that I helped investigate, performing different roles, during my internship included Pertussis, Legionella, Campylobacteriosis, and acute Hepatitis B.

Activities Performed at the Wyandotte County Health Department

The activities that I performed during my internship included: a) assisting in activities and projects conducted at the Communicable Disease Control program of the Wyco PHD, b) attending meetings and presentations given by different departments, c) observing public pool inspections, and d) participating in Local Distribution Site training.

Meetings and presentations

One of the initial activities was to attend a quarterly report meeting led by Mr. Terry Brecheisen, the director of the Wyco PHD. During the meeting, the director introduced new employees and interns, including me. I was able to meet many members of the different departments at this meeting. There was a lecture from the new head of the Quality Improvement

program. Quality improvement "consists of systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups" (HRSA, 2011). The long term goal of this committee is to identify inefficient processes within the health department and create new, sustainable processes.

Dr. Ingrid Garrison, the state veterinarian for the Kansas Department of Health and Environment, gave a presentation to animal control officers from Wyandotte County. Her lecture was part of a two-day training session created for the animal control officers. Dr. Garrison lectured on the epidemiology of the rabies virus, how to prevent exposure to the virus, and observation or quarantine periods for animals suspected of having rabies. Dr. Garrison also explained the role that the health department has in investigating animal bites for suspected rabies exposure. She emphasized that the officers should contact the local health department with any questions or concerns they may have relating to rabies.

Inspection of public swimming pools

Mr. Jim Baker is in charge of conducting pool inspections for the department of Environmental Health. I shadowed him during inspections of a hotel pool and spa, an apartment complex pool, and a homemade fountain that consisted of a tarp covering a large hole in the ground in the yard of an abandoned house. New ownership began construction of a fountain, but for unknown reasons he returned to his home state and left the fountain in its current condition. Originally, there was a pump in the fountain, but it has since been stolen. This hole in the ground represents a public health hazard because it retains water when it rains becoming a breeding ground for mosquitos that can carry pathogens like West Nile virus. Larvicide pellets were placed in the hole to prevent the birth of new mosquitos after the next rain shower.

The hotel pool and spa inspection consisted of checking the pH levels of the pool and Jacuzzi, and ensuring the pool lights worked properly. No visible signs of damage in or around the pool or spa were found. The hotel had a non-functioning pool light but the pool maintenance employee said that the part has been ordered to fix this light. The room did not have a sign that warned against changing water-proof diapers near the pool. A sign would be mailed to the maintenance employee to display, and a return visit would be scheduled in a month to ensure that the pool light was fixed and the sign displayed.

The apartment complex pool inspection was an excellent learning experience about proper pool safety and maintenance. The pool had rocks that were attached to the rim, but some were loose. The rocks are a hazard because some of them are quite large and could possibly fall on a person in the pool. The pool had hockey puck-size chlorine tablets sitting in the skimmer. This is a major health hazard to children because if consumed they can cause severe burns, vomiting, blood in stools, and other health hazards depending on the amount of chlorine consumed (Borke et al., 2015). The maintenance shed was unlocked and the chemicals and machinery were not stored properly. This pool was deemed unfit for use and closed until the issues were resolved.

Local Distribution Site training

The Emergency Preparedness department invited me to shadow them for a day and to participate in Local Distribution Site training. A Local Distribution Site is activated "during a Public Health emergency when it is necessary to initiate medical countermeasures (such as) distribution and dispensing of supplies" (Starbuck, 2016). This site repackages and distributes medical supplies from the federal government to hospitals, high exposure areas, and schools.

During this training exercise, I, along with several senior nurses, worked as a 'Supply Unit Leaders' overseeing the arrival, classification, and sorting of the medical supplies.

During the training, fake boxes of antibiotics were unpacked from a pallet, sorted by type, and repackaged in designated amounts to ship to imaginary dispensing points. Wyandotte County has a population of approximately 163,000 people with 21 designated points of dispensing which can serve 249, 678 people. The large number of dispensing points is to take into account the increase in people served if an emergency were to occur at events held in locations such as the Sporting KC stadium or the Kansas City Speedway. The Local Distribution Site previously dispensed medication during the 2009 H1N1 outbreak (Starbuck, 2016).

Products Developed

Deliverables associated with the rabies project

The deliverables for the rabies project consisted of rabies reporting forms for Wyandotte County, a rabies website on the Wyco PHD webpage, a rabies fact sheet, and a Microsoft PowerPoint presentation for medical providers. A form from Johnson County Department of Health and Environment was adapted for use in Wyandotte County in order to encourage an increase in reporting of rabies exposure from animal bites (Appendix 3). This was done by identifying prospective rabies exposures and collecting information required for a rabies investigation by the Wyco PHD. A rabies website was built to be accessed by animal control officers, police, physicians, veterinarians and the general public to input animal bite and rabies information (Appendix 10). The website http://www.wycokck.org/InternetDept.aspx?id=42991&menu_id=958 includes the aforementioned rabies reporting forms, the Kansas Department of Health and Environment (KDHE) rabies Exposure Assessment Algorithm, contact information for all animal control

departments within the county, a rabies fact sheet and links to additional information. The website is connected to the health department's communicable diseases' webpage via a hyperlink. The rabies fact sheet created provides basic information to the general public on rabies and animal bites (Appendix 8). The manager of the Communicable Disease Control program also requested the creation of a short PowerPoint presentation for medical providers that covers rabies sources, transmission, and proper post-exposure prophylaxis use.

Communicable Diseases website

The Disease Control & Prevention/ Tuberculosis webpage was updated and renamed Communicable Disease Control. The website was updated to more accurately represent the activities that the Communicable Disease Control program conducts, to allow easier access from the main health department website, and to house the new rabies website (Appendix 9).

Communicable Diseases spread sheet

A Microsoft Excel spread sheet was created for input of communicable diseases reported each month to the Wyco PHD (Appendix 11). This spread sheet consolidated this information in an easy to read format. The old form had a list of diseases organized alphabetically instead of grouped based on meaningful categories. This made it hard to draw conclusions about the disease cases reported monthly. In the new spread sheet, the diseases are color-coded and grouped into sections named as follows: enterics, hepatitis, respiratory, vaccine preventable, vector-borne, and uncommon. Also provided on the form are current and past year-to-date counts, and a monthly count for the previous year.

Communicable Diseases binder

Communicable Disease Control program binders, which contain a brief summation of information on Kansas reportable diseases, focusing mainly on Rabies and Tuberculosis, were

created. Binders include a list of reportable diseases in Kansas, the KDHE Reportable Disease form, the Rabies Exposure Determination form, the Rabies Investigation form, the KDHE Rabies Exposure Assessment Algorithm, information for employers on Tuberculosis extracted from the Centers for Disease Control (CDC), and a copy of the Tuberculosis form used by the Wyco PHD. These binders will be distributed to primary care physicians to increase their awareness about reportable diseases and the role of the Communicable Diseases program.

Core Competencies

Biostatistics

Basic descriptive and inferential statistical methodologies were used during the evaluation of rabies test result records from the KDHE and animal bite report files accessed at the Wyco PHD. The biostatistics course at Kansas State University provided an excellent foundation on the subject of biostatistics on which I was able to build upon during the field experience.

Environmental Health Sciences

An understanding of how environmental hazards and exposures affect overall health was provided by the MPH course on environmental toxicology. Environmental health methods were used during the swimming pool inspections conducted with Mr. Jim Baker. We evaluated the potential environmental hazards of some local swimming pools and a man-made fountain in an abandoned yard, and applied corrective measures for any hazards that were identified.

Epidemiology

Several epidemiological principles, such as measures of disease frequency, disease monitoring, and descriptive epidemiology, were applied during the field experience in relation to rabies related projects and the documentation created for the projects. In addition, epidemiology

principles were also employed during the disease investigations I observed and/or assisted with. My MPH courses provided me with epidemiological tools and methods which I was able to use and build upon during my field experience.

Health Services Administration

Interacting with personnel from Wyco PHD's different departments and programs provided a learning opportunity regarding the role and impact the public health department has on the accessibility of healthcare for the residents of Wyandotte County. Assisting in the tuberculosis clinic enabled me to directly impact the accessibility of healthcare for some of the residents of Wyandotte County.

Social and Behavioral Sciences

Wyandotte County has a highly diverse population made up of many ethnicities, cultures, and socioeconomic levels. Understanding this diversity enables the public health department to tailor programs and education in order to address the needs of different subsets of Wyandotte County residents.

Chapter 2 - The Challenge of Rabies in Public Health

Background on Rabies

Rabies is defined by the World Health Organization as "an infectious viral disease that is almost always fatal following the onset of clinical signs" (WHO, 2016). The rabies virus belongs to the genus *Lyssavirus*, family *Rhabdoviridae*. This virus has been in existence since at least 500 B.C. when the first description of rabies in dogs was recorded. 'Rabies' is a Latin word originally derived from the Sanskrit word 'rabhas' which means 'to do violence' (Garrison, 2016).

The rabies virus causes an infectious disease that kills approximately 55,000 people every year with 95% of these deaths occurring on the African and Asian continents. Forty percent of people who are bitten by suspect rabid dogs are children 15 years old or younger (WHO, 2016). Death from rabies is completely preventable by the use of a post-exposure vaccine, but lack of access to the vaccine and its high cost (~US $3,000) hinders people from receiving this necessary and lifesaving treatment. The cost of animal vaccination programs and of controlling stray animals has delayed efforts to reduce rabies levels in developing countries. According to the CDC, the United States (U.S.) spends approximately $245 to $510 million dollars annually on the prevention, testing and control of rabies (CDC, 2016).

Globally, the largest reservoir of the rabies virus is the domestic dog, but this virus can infect all mammals including humans (Brown et al., 2016). In the U.S. other mammals such as skunks, raccoons, bats, and foxes are also recognized reservoirs of the rabies virus. Rabies is usually transmitted from an infected mammal to a human or another mammal primarily through a bite that punctures the skin. This bite enables the rabies virus to enter into the body through

saliva transferred to the wound. A bite wound is not the only route of transmission. Exposure can also occur when infected saliva or brain material comes into contact with mucous membranes or an open cut in the skin. Once the virus enters into the body, it travels through the peripheral nervous system to the central nervous system where it causes acute encephalitis, which can lead to death (Brown et al., 2016).

The initial symptoms of a rabies infection are vague and often resemble flu symptoms. In people, these early symptoms include general weakness, discomfort, fever and headache, as well as, prickling or itching at the site of the bite. After these initial symptoms, there are two disease forms that can develop: "furious" rabies, which presents as hyperactivity, excited behavior, hydrophobia (fear of water), and possibly aerophobia (fear of flying); and "paralytic" rabies, which usually takes more time to develop and in which the muscles slowly become paralyzed. Death occurs in both forms due to cardiorespiratory arrest (WHO, 2016).

Rabies in the United States

In the United States, vaccination programs for domestic pets conducted by local veterinarians have helped reduce the number of laboratory-confirmed rabies cases in dogs from 6,949 in 1947 to 89 in 2013 (Brown et al., 2016). Despite reducing rabies in domestic animals, the U.S. still has a large wildlife reservoir, including raccoons, bats, skunks, and foxes, within which the virus is maintained (Figure 2.1). Rabid wildlife accounted for 92.6% of the total animal rabies cases reported in the U.S. in 2014, with raccoons accounting for 30.2% of all animal rabies cases. Domestic animals accounted for the remaining 7.4% of total animal rabies cases in 2014. In the state of Kansas, skunks are the most common rabies reservoir (CDC, 2016) (Figure 2.2). As of June 30th, 2016, the Kansas State Veterinary Diagnostic Laboratory has

received more positive test results on skunk samples (n = 25) than any other animal species submitted so far in 2016 (KSVDL Rabies Laboratory, 2016).

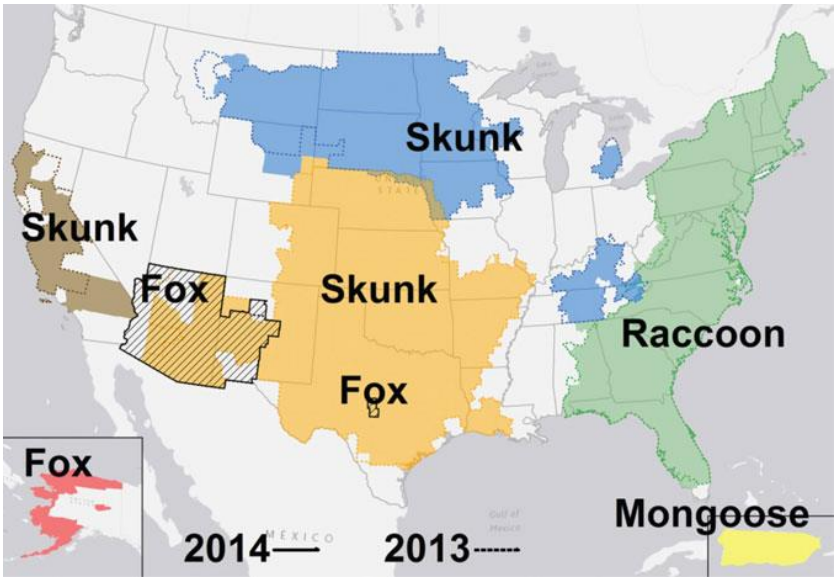


Figure 2.1 "Color-coded distribution of major rabies virus variant regions associated with mesocarnivores in the United States and Puerto Rico from 2008 to 2014"
(From http://www.cdc.gov/rabies/location/usa/surveillance/wild_animals.html)

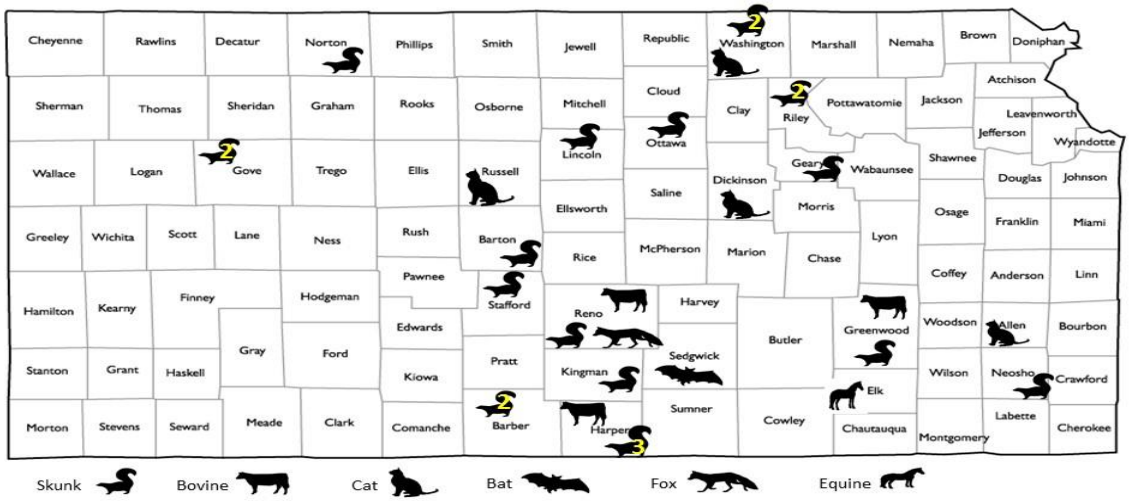


Figure 2.2 "Rabies trends in Kansas for 2016-Present"
(From http://www.ksvdl.org/images/disease-trends/Rabies%20Map%202016.jpg)

Post-rabies exposure

After a person has been bitten by an animal the wound should be washed with soap and warm water for a minimum of 15 minutes to decrease the risk of infection (WHO, 2014). A person should consider requesting a tetanus shot if they have not received one in the past ten years to prevent a possible tetanus infection from the animal bite (WHO, 2014). Not every person who is bitten by an animal will or should receive post-exposure prophylaxis. The rabies virus is only transmitted to and from mammals, and the animal bite must penetrate the skin to allow the virus direct access to muscle. A 10-day observation period for domestic pets or euthanasia and testing of wildlife should be conducted to determine if the administration of post-exposure prophylaxis is necessary. A person who has never received a pre-exposure rabies vaccination would additionally receive an injection of human rabies immune globulin (HRIG) to provide passive antibodies until the person's body begins producing its own antibodies in response to the rabies vaccine (KDHE, 2016). The rabies vaccine for humans is known as human diploid cell vaccine (HDCV) and it is administered in four intramuscular injections, or five if the person is immunocompromised, over a period of two weeks. On day zero, patients receive one dose of HRIG and their first dose of the HDCV vaccine. Then, booster doses of HDCV will be administered on days 3, 7, 14 and 28, the last only if they need a fifth dose. Patients that have had a rabies vaccine previously, receive two doses of HDCV on days 0 and 3 but no HRIG (KDHE, 2016). If during the course of post-exposure prophylaxis (PEP) treatment, the presumptive rabid animal is confirmed negative by the laboratory, PEP therapy may be discontinued.

Testing animals for the rabies virus

If a pet dog, cat or ferret bites a person, they are placed under a 10-day observation period starting on the same day that the pet bit the human patient. The pet can be observed at the owner's home, a licensed veterinary clinic, or an animal shelter. The reason for this observation period is due to the fact that dogs, cats, and ferrets can shed the virus in their saliva for up to 10 days before onset of clinical signs and then continue to shed the virus from onset until the death of the animal (KDHE, 2016). If the animal shows clinical signs of rabies during the 10-day period, then it is euthanized and its head sent to a designated rabies testing facility. If the observation period occurs at the owner's home, then a licensed veterinarian should examine the animal after the 10-day period to ensure that the pet is not displaying neurologic signs that could be missed by the owner. If the veterinarian deems the animal negative for rabies, then it is released from quarantine (KDHE, 2016). When a wild animal bites a person, the animal is immediately euthanized and the head submitted for testing. However, a bat should be sent intact for testing. A bite from a stray animal should be treated as a positive rabies exposure until the animal is confirmed negative by a certified laboratory. To confirm an animal as positive for rabies, the laboratory will perform a direct fluorescent antibody test on the animal brain (KSU, 2016). If the animal is not available for testing, then the full course of PEP should be administered (KDHE, 2016). The Kansas State University Rabies Laboratory in Manhattan, Kansas, is the primary diagnostic laboratory for the states of Kansas and Nebraska (KSU, 2016).

Regulations and reporting

Rabies is a reportable disease in the state of Kansas. All suspected and confirmed human and animal cases are required by law to be reported within four hours to the KDHE hotline as

outlined in the "REPORTABLE DISEASES IN KANSAS" list (Appendix 1). Not all reportable diseases are required to be reported within a 4-hour window but they all must be submitted to the KDHE via their electronic reporting tool used for surveillance known as EpiTrax (KDHE, 2014). The CDC has a national notifiable diseases surveillance system (NNDSS) in which states can voluntarily report health-related information. The NNDSS works in partnership with 57 health reporting authorities on the collection and dissemination of health-related information (CDC, 2015).

Animal bites, which are the main source of human rabies exposure, are not required by Kansas law to be reported to the KDHE. In contrast, the neighboring state of Missouri legally requires the reporting of animal bites. This discrepancy is attributed to the fact that each state creates their own reportable disease and condition list, thus, what is considered to be reportable will vary by state. Although the state of Kansas does not require the reporting of animal bites, it does require the reporting of suspect and confirmed rabies cases. In Wyandotte County the cities of Kansas City, Edwardsville, and Bonner Springs each have their own city codes for addressing rabies and rabid animals. These codes can be vague, and vary in protocol and jurisdiction (Appendix 2). For example, the Bonner Springs police department has complete jurisdiction over rabies investigations, while in Kansas City the 'Director of Animal Control' and 'Director of Health' share jurisdiction. In addition, Bonner Springs and Edwardsville city codes never make any reference to the 'local public health department' or 'Director of Health'. This allows the Bonner Springs and Edwardsville police departments to conduct investigations of suspect cases of rabies and never notify the Wyco PHD. This deprives the health department of valuable data about the number of animal bites occurring within Wyandotte County. The lack of communication between local cities and the health department hinders accurate rabies surveillance in the County

because the health department never receives reports of possible rabies exposures, or it receives information months after the incident has occurred. The KDHE will notify the Wyco PHD about animal specimens sent to the Kansas State diagnostic laboratory that have been declared positive or unsuitable for testing but the window of timely data collection has usually passed by the time the information reaches the health department. *The health department cannot conduct surveillance, monitoring, or dissemination of information regarding rabies to local cities if communication regarding rabies exposures does not exist.*

In the United States, wildlife such as skunks, foxes, raccoons, and bats serve as reservoir of the rabies virus. These animals can transmit the virus to other mammals such dogs, cats, and humans primarily through a bite that punctures the skin. Mandated reporting alerts of suspected and confirmed cases of rabies should be reported to local public health departments like the Wyco PHD, but this does not always occur. Differing city ordinances, the difficulty in defining what constitutes rabies exposure, and lack of current information on rabies and animal bites hinders the reporting of suspect cases by animal control officers, hospitals, and primary care physicians to the Wyco PHD. Thus, the health department needs to educate the human medicine community about rabies and animal bites, if reporting is to increase.

Chapter 3 - Field Experience

Overview of Projects

All the projects I conducted at the Wyco PHD had the goal of increasing the health department's communication to a specific population or the entire county population. First, rabies reporting forms were produced to increase communication between the health department and animal control officers or police officers regarding animal bites. Second, updates were made to the Communicable Diseases webpage to improve its accessibility and navigation for the general public and to add a rabies information section. Moreover, research was conducted to identify electronic tools that could be provided to school nurses to assist them in conducting syndromic surveillance in Wyandotte county's 73 schools within its boundaries. The following report is a description of the projects I worked on at the Wyco PHD including: a) creation of rabies reporting forms, b) update of the department's communicable disease webpage, and c) creation of tools for syndromic surveillance in local schools.

Rabies reporting

The Communicable Disease Control program wanted to increase its communication with local police departments and animal control officers. This was due to the health department receiving little to no information on animal bite incidents that could be considered rabies exposures. Since the Wyco PHD has no legal authority to demand the reporting of animal bite incidents, the plan was to create short, easy-to-use reporting forms to increase voluntary reporting.

The first of two forms created was the "Rabies Exposure Determination Form (Animal Bite) -Human" (Rabies Exposure Determination Form) used for human rabies exposure (Appendix 5). This form would be used by police or animal control officers to assist with the

determination of human rabies exposure. The initial format was borrowed, with permission, from the Johnson County Department of Health and Environment and edited to suit the needs of the Wyandotte County health department (Appendix 3). The form, written in English (only), consisted of two questions; Number 1) was "Was/were the animal(s) exhibiting signs/symptoms of rabies at the time of exposure?", which can be answered yes, no or unknown, and the prominent symptoms of the animal can be selected from a list of available options below this question. Number 2) was "Was it possible that the animal(s) had any contact with any potential rabies vectors?", which can also be answered yes, no or unknown. Included in the questionnaire is a list of possible animal vectors. Depending on how the questions are answered, the police or animal control officer is advised as to whether or not a rabies exposure may have occurred.

If the officer is unsure how to answer the questions asked on the Rabies Exposure Determination Form, he/she is directed to review the Rabies Exposure Assessment Algorithm created by the KDHE (Appendix 7). This algorithm consists of a flow chart that guides the police or animal control officer to the correct procedure for post-exposure prophylaxis usage and rabies testing based on the animal bite incident, the species of animal implicated, and if the animal is available for testing. A copy of the algorithm can be found on the new rabies website on the health department's webpage (KDHE, 2016). If the officer determines that an exposure may have occurred, then he or she is directed to fill out a second form entitled "Rabies Investigation" form. This form collects detailed information on the human potentially exposed, the animal involved and its owner, if applicable, the vaccination status of the animal if known, where it was observed, and if it was euthanized. This information is used by the health department in reporting suspect or confirmed rabies cases to the KDHE EpiTrax which is the electronic surveillance and reporting system used in Kansas (KDHE, 2016). The Rabies Exposure Determination Form also

refers the reporting officer to direct any remaining questions to the office of Communicable Disease Control program at the Wyco PHD. If the officer concludes that rabies exposure did not occur, based on the provided algorithm, then the incident does not have to be reported to the Communicable Disease Control Program. Ideally, this form will decrease the confusion on what constitutes rabies exposure and when to notify the health department.

The second form entitled "Rabies Investigation Form - Human" (Rabies Investigation Form) was created from the former rabies investigation form used by the health department (Appendix 5). The manager of the Communicable Disease Control program wanted the new rabies investigation form to be current with the guidelines set out by the current Compendium of Animal Rabies Prevention and Control, 2016 and the Advisory Council on Immunization Practices (Appendix 6) (Rupprecht et al., 2010; Brown et al., 2016). Recommendations on human post-exposure prophylaxis changed from administering five doses to only administering four doses for an individual with a healthy immune system. The animal observation and quarantine time periods were changed in the new form to reflect the new quarantine period for an animal based on their rabies vaccination status. The new rabies investigation form is streamlined to focus on human rabies exposure. This reduced unnecessary and repetitive questions making the form more user friendly. Additionally, a notes section was added to allow for capture of information not covered by the questions listed on the form.

Analyzing Communicable Disease Control Program's animal bite report information

The Communicable Disease Control program has on file the paper animal bites reports it received in the year 2015 and from January 2016 to date. Likely this is not a complete record of total animal bite incidents that have occurred in Wyandotte County, because no mandate

currently exists that requires the reporting of animal bites in Wyandotte County or Kansas City, KS. I took the information from these reports and grouped it into categories including age range of the bite victim, where the bite report originated from, the species of the animal involved, and month of bite report. The ages of the bite victims were grouped into categories entitled, 'young children' (1-6 yrs old), 'children and teenagers' (7-15 yrs old), 'young adults' (16-25 yrs old), 'adults' (25's – 40's), 'middle age' (50's), and 'senior citizens' (60's plus). In 2015, the Communicable Disease Control Program received 44 animal bite reports. The bites occurred with the highest frequency during the summer months and early fall. Tweens/teenagers was the most common age range of bite victims (n = 14) followed by adults (n = 9) and then young children (n = 8). I was surprised by these data, because I assumed that young children would be the most common age range since they would presumably be more likely to interact with unfamiliar or wild animals. The reports originated from hospitals, a police department, and a school. From January 2106 to present, the Communicable Disease Control Program has received 46 animal bite reports. The bites occurred with the highest frequency in the spring months with tweens/teenagers again as the most common victim (n = 15). The reports originated from hospitals, health departments, animal control, and a primary care clinic (Appendix 14).

The KDHE was contacted to request information on animal specimens submitted for rabies testing. I received a Microsoft Excel spreadsheet that contained data from KDHE's Epitrax, spanning 1986 to present, on the number of specimens that tested positive for rabies or were declared unsuitable for testing and presumed positive. I also received Excel spread sheets that contained data from the Kansas State University Rabies Diagnostic Laboratory on specimens submitted from 2011-2016 that tested negative. From 1989 to present, six bats, two cats, one raccoon, and one skunk were declared positive for the rabies virus. From 2011 to present, 26

cats, 28 dogs, four raccoons, and three bats were declared negative for rabies. (Appendix 15). This data assisted with identifying the burden of the rabies virus in Wyandotte County.

Communicable Disease Webpage

At the start of my field experience, the health department's webpage did not have any information on animal bites or rabies. This was a problem because the Communicable Disease Control program wanted increased rabies reporting, yet no disease information was being provided in a format that was readily accessible to partners and the public. Thus a rabies webpage that links to the Communicable Disease homepage was created (UG, 2014). The website now includes the "Rabies Exposure Determination Form" and "Rabies Investigation Form" documents, a link to the KDHE Rabies Assessment Algorithm, and a rabies facts sheet (Appendix 8 & 9). The information was separated into two different sections, one for the general public and another for medical providers, veterinarians, animal control, or police. Additional information at the bottom of the webpage provides links to the KDHE rabies website; the Compendium of Animal Rabies Prevention and Control, 2016, and the Advisory Committee on Immunization Practices (Rupprecht et al., 2010; Brown et al., 2016).

Prior to my work this summer, it was very difficult to navigate the Communicable Disease Control webpage on the health department's website. There was a link in the form of a picture labeled Emergency Preparedness/Disease Control on the health department homepage. Upon clicking this link, the user was directed to the emergency preparedness webpage. However, a search through the alphabetical list of services was the only route to find the Communicable Disease Control webpage. Prior to my arrival the lack of accessibility to this website was identified as a potentially significant barrier to the overall goal of increasing communication

between the Wyco PHD and the residents of Wyandotte County. This problem could also negatively impact the use of the new rabies webpage because it was connected to the Communicable Disease Control webpage. The problem was ultimately resolved through creation of a link to the Communicable Disease Control webpage on the Emergency Preparedness website. Hopefully this new link will decrease the amount of searching required and increase traffic to the website. Additionally, a tuberculosis (TB) webpage is being created by the Communicable Disease Control manager. This webpage, like the rabies webpage, will link to the new Communicable Disease Control webpage. This is being done to prevent the Communicable Disease Control webpage from becoming cluttered, and to provide adequate space for information on active TB disease, monitoring latent infection, treatment of TB, services provided by the TB clinic, and the operating hours of the clinic.

Syndromic surveillance in local schools

Health departments utilize various surveillance techniques to collect, analyze, and interpret health-related data (Young, 2005). During my internship a project was proposed on syndromic surveillance with school nurses. The focus of syndromic surveillance is the collection of symptomatic information for the purpose of monitoring disease indicators in a timely manner to detect outbreaks sooner than would be possible with other surveillance techniques. Currently, there is a webpage that is essentially an online form where nurses report the number of gastrointestinal, *Streptococcus* spp. - throat, respiratory and influenza-like illnesses, as well as the number of absences which the Communicable Disease Control manager can use to view counts of illness from schools located in Wyandotte County. The Communicable Disease Control manager was asking the school nurses to voluntary report the information, but the nurses

were not receiving useful feedback, such as reports about illness and absentee trends in each respective school. A mass e-mail list exists, but the Communicable Disease Control manager believes that little information warrants mass dissemination to every school in the county. A tool was needed to publish health-related information that could be accessed by school nurses and provide useful information to schools. Additionally, with this website enhancement, schools could receive important state and local health-related information from the Kansas Health Alert Network (KDHE, 2015).

The first step was to compile data about the number of schools that were reporting illness and absentee information. This will serve as a baseline which can be applied to school reporting submission data collected after the new webpage is available. Data was collected for the 2014-2015 and the 2015-2016 school years (Appendix 12). This information was then sorted into the total number of schools that reported in a given year, the total number of schools that reported each month from September to May, and the total number of schools that reported every month from September to May. Wyandotte County has a total of 72 schools consisting of 52 elementary schools, 11 middle schools and 10 high schools. During the 2014-2015 school year, five elementary schools (9.6%), two middle schools (18%) and zero high schools reported every month from September to May. In that same year, nineteen elementary schools (37%), four middle schools (36%) and two high schools (20%) reported at least once during the school year. During the 2015-2016 school year, seven elementary schools (13%), one middle school (9%) and zero high schools reported every month. However, twenty-two elementary schools (42%), four middle schools (36%), and five high schools (50%) reported at least once. There is a potential error with submissions currently as a user name is not associated with a particular school. For example, a nurse may accidentally submit a report for the school Argentine instead of their

respective school because Argentine is the default choice if a school isn't selected from the dropdown list on the report form.

The next step was to analyze the surveillance reports and websites used by different counties. The Wyco PHD had an existing agreement with the Sedgwick county health department, which gave us administrator access to their 'School Illness Reporting' website. The overall analysis provided insight into the utilization of message boards, the different types of illness reporting forms, and how the data were presented. A message board and the timely release of weekly reports were the most common tools in use. These tools provide a potential incentive for nurses to report weekly information. The more nurses conduct weekly reporting, the more effective the syndromic surveillance would be in providing timely information on the incidence of illness in schools in Wyandotte County

Future public health initiatives

The National Syndromic Surveillance Program's (NSSP) Biosense Platform is "a secure cloud-based computing environment in which practitioners can use tools to rapidly collect, evaluate, store, and share data" (CDC, 2016). Beginning July 18th 2016 and ending in November 2016, the NSSP is implementing a syndrome based surveillance application created by John Hopkins University Applied Physics Laboratory and Division of Preventive Medicine at the Walter Reed Army Institute of Research called ESSENCE. ESSENCE stands for Electronic Surveillance System for the Early Notification of Community-Based Epidemics. The first version, ESSENCE 1, was designed for global surveillance in United States' military treatment facilities. A second version, ESSENCE 2, was designed for use in medical facilities in the District of Columbia area (Lombardo and Pavlin, 2004). A refined version of the ESSENCE

application is now being added to the NSSP's Biosense Platform and will collect hospital data from 47 states and the District of Columbia (CDC, 2016).

During this transition to ESSENCE, nine health jurisdictions will be enrolled to this new program every four weeks. The state of Kansas is in the first set of jurisdictions set to be enrolled starting July 18th (Figure 2.3). When the process is complete, hospitals, epidemiologists, and local public health departments in Kansas will all have access to ESSENCE (KDHE, 2016).

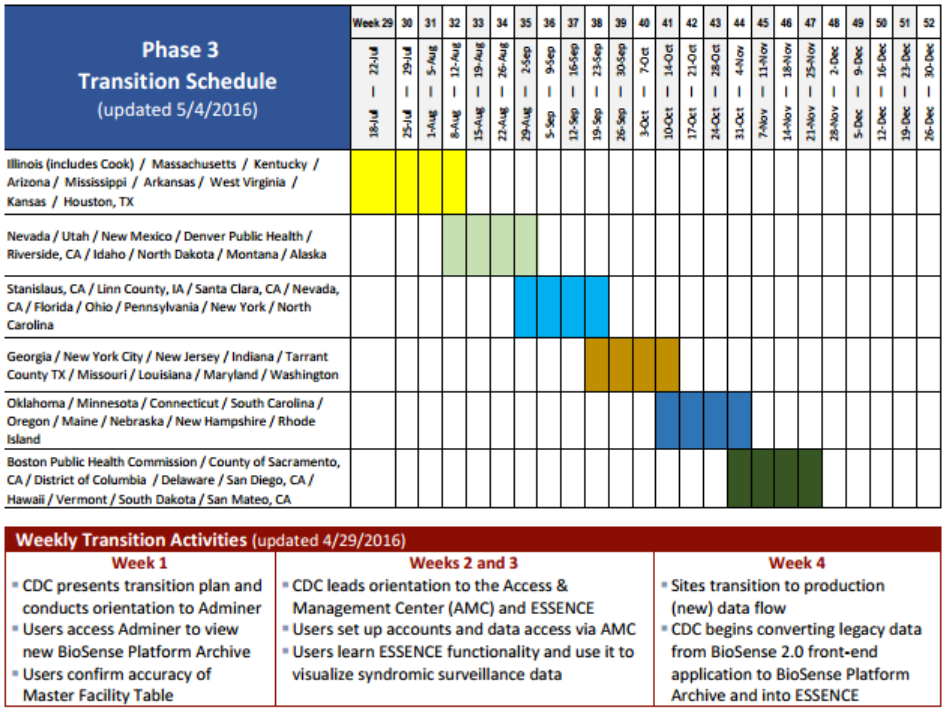


Figure 2.3 ESSENCE Transition schedule
(From http://www.cdc.gov/nssp/documents/nssp-update-2016-06.pdf)

This transition to ESSENCE will allow the Wyco PHD to query rabies related topics such as animal bites or post exposure prophylaxis use in emergency rooms in Wyandotte County. The purpose of the queries is to identify rabies related trends or clusters that require the attention of the Communicable Disease program.

Kansas' participation in ESSENCE will allow the Wyco PHD to query the number of cases of gastrointestinal, *Streptococcus* spp. throat infections, respiratory, and influenza-like illnesses reported in emergency rooms in this county. The data collected from ESSENCE combined with data from the school nurses could serve as an alert to the Communicable Disease Control program, if there is an increase in disease incidence. Moreover, this observation can be distributed to school nurses to help them respond more quickly to the occurrence of outbreaks among the student population. The use of ESSENCE and its data will allow the health department to conduct accurate and timely syndromic surveillance in Wyandotte County (CDC, 2016).

The projects completed during this field experience were tied to the specific goal of increasing communication with the residents of Wyandotte County. This work made it easier to find the Communicable Disease's webpage, increased the amount of accessible rabies information on the Communicable Disease Control webpage, provided up-to-date forms for animal bite reporting, and analyzed the amount of school illnesses reporting conducted by school nurses.

Chapter 4- Conclusion

Challenges of working at a Public Health Department

Working in a public health department is rewarding but it also comes with its own challenges and limitations. It is a city, county, or state run entity, thus the resources available are tied to a fluctuating budget. The Unified Government of Wyandotte County and Kansas City, KS 2016 Amended and 2017 Operating budget, will see a decrease of 5.8% ($5,257) in Public Health Emergency Preparedness funding, which will be used to support a national Zika response program (UG, 2016). A health department's yearly budget can greatly influence what can be accomplished and when personnel vacancies can be filled. When there is not enough funding for the hiring of personnel, the growth of health programs to serve an increasing population can be compromised. For instance, the Communicable Disease manager has to conduct every disease investigation when the main epidemiologist is absent, as such the Communicable Disease Control Program could employ another disease investigator. This would give the manager more time to work on projects such as syndromic surveillance.

I noted several challenges while working at the Wyco PHD that may be unique to this County. In 2016, the Robert Wood Johnson Foundation ranked Wyandotte County as the least healthy county in the state of Kansas. It ranked 101st place out of 101 counties. There are 105 counties in Kansas, but four were not ranked. The residents of Wyandotte County tended to smoke more, be obese, and be physically inactive. In addition, 22% of residents in Wyandotte are uninsured compared to the Kansas average of 14% (RWJ Foundation, 2016). In addition to serving its residents, the health department also provides health services specific for refugees who come to Wyandotte County. The language and cultural differences can make it difficult to clearly communicate with refugees or immigrants.

Communication within Wyandotte County

I believe there is a disconnect between the health department and the rest of Wyandotte County including City Hall. This may be due to the fact that there is no specific position in the Wyco PHD devoted entirely to communication. There is a need for a public relations person for the health department who could give press conferences, manage the health departments' social media outlets like Facebook and Twitter, and manage and refresh content posted on the health department's webpage, enabling distribution of time sensitive health information to the community. Currently, there are a few people who devote some of their time to communication related activities. However, the department will benefit from hiring a full-time public information officer.

Based on my work on the Communicable Disease webpage, the Communicable Disease manager has developed a plan to jump start communication with the residents of Wyandotte County. Her plan is to contact all supervisors/managers to ask if there is interest among the personnel in their divisions and programs, to meet and discuss a more unified plan for the website. This includes updating individual division or program pages and, if there is interest, potentially addressing the overall layout, navigation, and ease of use of the website. The Wyco PHD has been working on a new printed health brochure, but the Communicable Disease manager is afraid it will direct people to a website that is subpar. Moreover, the Wyco PHD currently does not have any designated staff for conducting Health Informatics. A health informatics analyst would record and analyze health data from Wyandotte County to discover developing health trends that could be addressed by the Health Department (UG, 2015).

The Wyco PHD is also pursuing accreditation by the national Public Health Accreditation Board. This is a voluntary process with the end goal of "improving and protecting the health of the public by advancing the quality and performance of Tribal, state, local, and territorial public

health departments" (PHAB, 2013). In the upcoming years, the Wyco PHD will conduct a Community Health Assessment and Community Health Improvement Plan which is required prior to filing an application with the Public Health Accreditation Board. The Wyco PHD plans to apply for accreditation in 2018 (UG, 2016).

Working at the Wyandotte County Public Health Department allowed me to learn about the challenges, limitations, and rewards of providing health services to the residents of Wyandotte County. It also enabled me to learn about the different forms and methods of health communication, and why it is so important to tailor the information to the intended audience. The health department is taking steps to become accredited by the Public Health Accreditation Board which involves conducting a Community Health Assessment and a Community Health Improvement Plan. These actions should identify the needs of the residents of Wyandotte County and provide the health department with future goals of improving the quality of life for the years to come.

References

"2016 Amended and 2017 Operating Budget." Unified Government of Wyandotte County and Kansas City, KS, 1 Jan. 2016. Web. 22 July 2016. http://www.wycokck.org/uploadedFiles/Departments/Finance/2016%20Budget/2016%20Amended%202017%20Proposed%20Budget.pdf

2016 Kansas Annual Rabies Testing Results. Kansas State University, 3 May 2016. Web. 16 June 2016. http://www.ksvdl.org/rabies-laboratory/diagnostic-test/rabies-results/kansas/2016/index.html.

"2015 Amended and 2016 Operating Budget." Unified Government of Wyandotte County and Kansas City, KS, 1 Jan. 2015. Web. 22 July 2016. http://www.wycokck.org/uploadedFiles/Departments/Finance/2016%20Budget/2015%20Amended%202016%20Proposed%20Budget.pdf

About Us. Unified Government of Wyandotte County and Kansas City, KS, 2014. Web. 29 June 2016. http://www.wycokck.org/InternetDept.aspx?id=19468&menu_id=958&banner=15284.

Brown, Catherine M., Sally Slavinski, Paul Ettestad, Tom J. Sidwa, and Faye E. Sorhage. "Compendium of Animal Rabies Prevention and Control, 2016." Public Veterinary Medicine: Public Health 248.5 (2016): 505-17. Print. 16 June 2016

Borke, Jesse, David Zieve, and Isla Ogilvie. Chlorine poisoning. Medline Plus, 4 Nov. 2015. Web. 25 June 2016. https://www.nlm.nih.gov/medlineplus/ency/article/002772.htm.

"Comprehensive Annual Financial Report." Financial Reports. Unified Government of Wyandotte County and Kansas City, KS, 31 Dec. 2015. Web. 29 June 2016. http://www.wycokck.org/InternetDept.aspx?id=16640&menu_id=954&banner=15284.

County Health Rankings & Roadmaps. Robert Wood Johnson Foundation, 2016. Web. 21 July 2016. http://www.countyhealthrankings.org/app/kansas/2016/rankings/wyandotte/county/outcomes/overall/snapshot.

Data Collection and Reporting. CDC, 6 Mar. 2015. Web. 17 June 2016. https://wwwn.cdc.gov/nndss/data-collection.html

DeSalvo, Karen B., Patrick W. O'Carroll, Denise Koo, John M. Auerbach, and Judith A. Monroe. "Public Health 3.0: Time for an Upgrade." American Journal of Public Health 106.4 (2016): 621-22. Web. 22 July 2016. http://web.a.ebscohost.com.er.lib.k-state.edu/ehost/pdfviewer/pdfviewer?sid=5d472c51-ee4f-4039-afe3-f4bbec91e454%40sessionmgr4006&vid=1&hid=4106.

Emergency Preparedness/Disease Control. Unified Government of Wyandotte County and Kansas City, KS, 2014. Web. 22 June 2016. http://www.wycokck.org/Internetdept.aspx?id=564&menu_id=958&banner=15284.

Garrison, Ingrid. "Rabies What ACOs and LEOs Need to Know." KDHE. Kansas City, KS. 2 Feb. 2016. Lecture. 16 June 2016

"HD School Symptoms reports." Unified Government of Wyandotte County/KCK Reports. UGPHD, 2016. Web. 20 June 2016. http://ugreports/Reports/Pages/Folder.aspx?ItemPath=%2fHealth+Department&ViewMode=List.

Kansas Health Alert Network. KDHE, 2015. Web. 23 June 2016. http://www.kdheks.gov/it_systems/ks-han.htm.

"Kansas Notifiable Diseases List." Disease Reporting for Health Professionals. Kansas Department of Health and Environment, 29 Sept. 2014. Web. 16 June 2016. http://www.kdheks.gov/epi/disease_reporting.html.

Lombardo, Joseph S., and H. Burkom Pavlin. "ESSENCE II and the Framework for Evaluating Syndromic Surveillance Systems." Morbidity and Mortality Weekly Report (MMWR) 53 (2004): 159-65. Web. 28 June 2016. http://www.cdc.gov/mmwr/preview/mmwrhtml/su5301a30.htm.

NSSP Update (June 2016). CDC, June 2016. Web. 26 June 2016. http://www.cdc.gov/nssp/documents/nssp-update-2016-06.pdf.

Public Health 3.0. Office of Disease Prevention and Health Promotion, 2014. Web. 19 July 2016. https://www.healthypeople.gov/2020/tools-resources/public-health-3.

Quality Improvement. US Department of Health and Human Services Human Resources and Services Administration(HRSA), Apr. 2011. Web. 25 June 2016. http://www.hrsa.gov/quality/toolbox/methodology/qualityimprovement/.

"Quick Facts Wyandotte County, Kansas." United States Census Bureau, 2015. Web. 29 June 2016. http://www.census.gov/quickfacts/table/PST045215/20209,00.

"Rabies Investigation Guideline." Kansas Department of Health and Environment, Mar. 2016. Web. 16 June 2016. http://www.kdheks.gov/epi/Investigation_Guidelines/Rabies_Disease_Investigation_Guideline.pdf.

Rabies. CDC, 18 Apr. 2016. Web. 16 June 2016. http://www.cdc.gov/rabies/index.html.

Rabies. World Health Organization, Mar. 2016. Web. 16 June 2016. http://www.who.int/mediacentre/factsheets/fs099/en/.

Rupprecht, Charles E., Deborah Briggs, Catherine M. Brown, Richard Franks, Samuel Kate, Harry D Kerr, Susan M Lett, Robin Levis, Martin I Meltzer, William Schaffner, and Paul R Cieslak. "Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies." Morbidity and Mortality Weekly Report (MMWR) 59 (2010): 1-9. Print.

Starbuck, Ron. "Local Distribution Site Standard Operating Guide." Unified Government of Kansas City, KS and Wyandotte County Dept. of Public Health (2016): 1-7. Print. 14 June 2016.

What is Public Health Department Accreditation? Public Health Accreditation Board, 2013. Web. 22 July 2016. http://www.phaboard.org/accreditation-overview/what-is-accreditation/.

"WHO Guide for Rabies Pre and Post Exposure Prophylaxis in Humans." World Health Organization, Dec. 2014. Web. 7 July 2016. http://www.who.int/rabies/PEP_Prophylaxis_guideline_15_12_2014.pdf?ua=1.

Wilson, Elisha l., Joseph R. Egger, Kevin J. Konty, Marc Paladini, Don Weiss, and Trang Q. Nguyen. "Description of a School Nurse Visit Syndromic Surveillance System and Comparison to Emergency Department Visits, New York City." American Journal of Public Health 104.1 (2014): 50-56. Print.

Young, T K. Population Health Concepts and Methods. New York: Oxford University Press, 2005. 96. Print. 11 August 2016.

Appendix

Appendix 1. Reportable Diseases in Kansas

REPORTABLE DISEASES IN KANSAS for health care providers, hospitals, and laboratories
(K.S.A. 65-118, 65-128, 65-6001 - 65-6007, K.A.R. 28-1-2, 28-1-4, and 28-1-18. Changes effective as of 4/28/2006)

☎ - Indicates that a telephone report is required by law within four hours of *suspect* or *confirmed* cases to KDHE toll-free at 877-427-7317

ⓘ - Indicates that an isolates must be sent to: Division of Health and Environmental Laboratories
Forbes Field, Building #740, Topeka, KS 66620-0001
Phone: (785) 296-1633

Acquired Immune Deficiency Syndrome (AIDS)
Amebiasis
Anthrax ☎
Arboviral disease (including West Nile virus, Western Equine encephalitis (WEE) and St. Louis encephalitis (SLE)) - indicate virus whenever possible
Botulism ☎
Brucellosis
Campylobacter infections
Chancroid
Chlamydia trachomatis genital infection
Cholera ☎
Cryptosporidiosis
Cyclospora infection
Diphtheria
Ehrlichiosis
Escherichia coli O157:H7 (and other shiga-toxin producing E. coli, also known as STEC) ⓘ
Giardiasis
Gonorrhea
Haemophilus influenza, invasive disease
Hantavirus Pulmonary Syndrome
Hemolytic uremic syndrome, postdiarrheal
Hepatitis, viral (acute and chronic)
Hepatitis B during pregnancy
Human Immunodeficiency Virus (HIV) (includes Viral Load Tests)
Influenza deaths in children <18 years of age
Legionellosis
Leprosy (Hansen disease)
Listeriosis
Lyme disease
Malaria
Measles (rubeola) ☎
Meningitis, bacterial ☎
Meningococcemia ⓘ ☎
Mumps ☎
Pertussis (whooping cough) ☎
Plague (Yersinia pestis) ☎
Poliomyelitis ☎
Psittacosis
Q Fever (Coxiella burnetii) ☎
Rabies, human and animal ☎
Rocky Mountain Spotted Fever
Rubella, including congenital rubella syndrome ☎
Salmonellosis, including typhoid fever ⓘ
Severe Acute Respiratory Syndrome (SARS) ⓘ ☎
Shigellosis ⓘ
Smallpox ☎
Streptococcal invasive, drug-resistant disease from Group A *Streptococcus* or *Streptococcus pneumoniae* ⓘ
Syphilis, including congenital syphilis
Tetanus
Toxic shock syndrome, streptococcal and staphylococcal
Transmissible Spongioform Encephalopathy (TSE) or prion disease (includes CJD)
Trichinosis
Tuberculosis, active disease ⓘ ☎
Tuberculosis, latent infection
Tularemia
Varicella (chickenpox)
Viral hemorrhagic fever ☎
Yellow fever

In addition, laboratories must report:
- Viral load results of reportable diseases
- ALL blood lead levels, as of 12/2002 (KCLPPP/ABLES)
- CD4+ T-lymphocyte count < 500/ µl or CD4+ T-lymphocytes <29% of total lymphocytes

Outbreaks, unusual occurrence of any disease, exotic or newly recognized diseases, and suspect acts of terrorism should be reported within 4 hours by telephone to the Epidemiology Hotline: 877-427-7317

Mail or fax reports to your local health department and/or to:
KDHE Office of Surveillance and Epidemiology, 1000 SW Jackson, Suite 210, Topeka, KS 66612-1274
Fax: 877-427-7318 (toll-free)

Appendix 2. Animal Bite and Rabies Codes for Wyandotte County

Kansas Statutes and Regulations

28-1-13. **Rabies control; isolation of mammals causing exposure to rabies for observation and examination; quarantine of mammals exposed to rabies.**

(a) In conjunction with investigation of the exposure to rabies of a human or other mammal by another nonhuman mammal, the isolation of the mammal causing exposure to rabies shall be as follows.

(1) An owned or wanted dog, cat, or ferret shall be isolated for 10 days as determined by the local health officer or the local health officer's designee at one of the following locations:

(A) The residence of the owner of the dog, cat, or ferret;

(B) in a veterinary hospital; or

(C) at a facility holding a current state pound and shelter license. During this time the local health officer or the local health officer's designee shall determine whether or not the dog, cat, or ferret is suffering from rabies, and if not, the local health officer or the local health officer's designee shall authorize the release of the dog, cat, or ferret upon payment by the owner of the boarding fee.

(2) Stray, unclaimed, or unwanted dogs, cats, or ferrets shall be sacrificed immediately and the head submitted for laboratory examination for evidence of rabies infection.

(3) The management of horses, cattle, and sheep shall be determined by the local health officer or the local health officer's designee.

(4) Mammals, other than dogs, cats, ferrets, horses, cattle, or sheep, including the offspring of wild species cross-bred with domestic dogs and cats, skunks, foxes, raccoons, coyotes, bats, and other species known to be involved in the transmission of rabies, whether owned or unowned, shall be sacrificed immediately and the head submitted for laboratory

examination for evidence of rabies infection. Any mammal that has been vaccinated may be sacrificed and tested if the period of virus shedding is unknown for that species.

(5) Mammals, including rabbits, hares, gerbils, guinea pigs, hamsters, mice, rats, squirrels, chipmunks, and other species not known to be involved in the transmission of rabies, need not be sacrificed and submitted for laboratory examination for evidence of rabies infection, unless the circumstances of the potential exposure to rabies incident, in the judgment of the local health officer or the local health officer's designee, indicate otherwise.

(6) The disposition of mammals that are not known to be involved in the transmission of rabies and that are maintained in zoological parks, shall be in accordance with the judgment of the local health officer or the local health officer's designee.

(b) Quarantine of mammals exposed to rabies by a known or suspected rabid mammal shall be as follows.

(1) Stray, unclaimed, or unwanted dogs, cats, or ferrets shall be sacrificed immediately.

(2) Dogs, cats, or ferrets that have an owner, are wanted by that owner, and are not immunized against rabies shall be quarantined for six months at one of the following locations, as determined by the local health officer or the local health officer's designee:

(A) The residence of the owner of the dog, cat, or ferret;

(B) in a veterinary hospital; or

(C) at a facility holding a current state pound and shelter license. These dogs, cats, or ferrets shall be immunized against rabies one month before release from quarantine. The local health officer or the local health officer's designee shall authorize the release of the dog, cat, or ferret upon payment of the boarding fee.

(3) Dogs, cats, ferrets, horses, cattle, and sheep that have an owner and are wanted by that owner, and for which the owner produces rabies vaccination certificates that contain the following information shall be immediately revaccinated and kept under the owner's control and observed for 45 days:

(A) the expiration date of the rabies vaccination; and

(B) positive identification for each of these mammals showing that the mammals are currently vaccinated by a licensed veterinarian with an approved vaccine for that species.

(4) Horses, cattle, and sheep not vaccinated with an approved vaccine for that species shall be sacrificed immediately or quarantined for six months under conditions satisfactory to the local health officer or the local health officer's designee. The local health officer or the local health officer's designee shall authorize the release of the horse, cow, or sheep upon payment of any boarding fees.

(5) Other mammals shall be sacrificed immediately, except for those mammals currently vaccinated with an approved vaccine for that species. Mammals that have been appropriately vaccinated may be immediately re-vaccinated and quarantined for at least 90 days under conditions satisfactory to the local health officer or the local health officer's designee.

(Authorized by K.S.A. 65-128, K.S.A. 65-101; implementing K.S.A. 65-101; effective May 1, 1982; amended May 1, 1986; amended July 5, 1996; amended April 24, 1998.)

28-1-14. **Rabies control in wildlife mammals.**

(a) The possession or sale of skunks, raccoons, foxes and coyotes for keeping of these mammals as pets shall be prohibited.

(b) Removal of musk glands of skunks for purposes of attempted domestication shall be prohibited.

(c) Except as permitted by the secretary, attempts to immunize skunks, coyotes, raccoons, foxes, and other wildlife mammals known to be involved in the transmission of rabies shall be prohibited.

(d) Subsections (a) and (b) of this regulation shall not apply to bonafide zoological parks or research institutions. (Authorized by and implementing K.S.A. 65-101; effective May 1, 1982; amended May 1, 1983; amended July 5, 1996.)

Bonner Springs

CHAPTER II. ANIMAL CONTROL AND REGULATION

ARTICLE 1. GENERAL PROVISIONS

2-117. Impoundment of Rabies Suspects.

(a) When any animal subject to rabies has bitten or attacked any person, or when an animal is suspected of having rabies, it shall be the duty of any person having a knowledge of the facts to report the same immediately to the Police Department.

(b) Licensed dog or cat.

(1) The owner or harborer of a properly vaccinated biter dog or cat shall have the dog or cat examined by a licensed veterinarian, of their choice, who shall submit a report to the Animal Control Officer within 24 hours of the incident.

(2) The biter dog or cat may be impounded upon the licensed premises by the owner or harborer. Impoundment shall mean within a structure or secure enclosure or upon a leash only upon the premises of the owner or harborer. The period of impoundment shall be 10 days.

(3) The owner or harborer of a properly vaccinated biter dog or cat shall have the dog or cat examined by a licensed veterinarian again on the 10th day of impoundment. A written report by the veterinarian that the biter dog or cat is not affected by rabies, filed with Animal Control Officer, shall terminate impoundment.

(c) Unvaccinated dog or cat.

(1) The owner or harborer of a biter dog or cat which has not been vaccinated shall have it examined immediately by a licensed veterinarian who shall submit a report to the Animal Control Officer within 24 hours of incident.

(2) The animal shall be confined for a period of 10 days upon the premises of a duly licensed veterinarian, located within the City. It shall be unlawful for any person to release from confinement any animal or remove any animal from its place of confinement to another place without the consent of the Animal Control Officer. The confinement of the animal shall be at the expense of the owner or custodian of the animal. Following consultation with a licensed veterinarian, if the Animal Control Officer has reasonable cause to believe the animal is diseased, or upon exigent circumstances, the Animal Control Officer shall be empowered to order examination of the animal to determine whether it may have rabies. It shall be unlawful for any person to refuse to surrender any animal for quarantine when demand is made by the order of the Animal Control Officer. If the animal dies or is killed, a laboratory examination of the head shall be made, at the expense of the animal's owner or custodian. (Ord. 1492, Sec. 5.10.100)

2-118. Animals Bitten by Rabid Animals

Whenever a dog, cat or other animal is bitten by a rabid animal or an animal later proved to have been rabid, it shall be the duty of the owner of the animal that is bitten, to report that fact to a licensed veterinarian and/or the Police Department. It shall also be the duty of the owner of the bitten animal to either destroy or have his or her bitten animal destroyed unless:

(a) The animal which was bitten has been vaccinated against rabies at least three (3) weeks before being bitten and has a current vaccination; and

(b) If the bitten animal has a current vaccination, it shall be confined for 90 days; and

(c) The bitten animal shall be released from confinement only upon written order from a licenses veterinarian, who declares the animal to be free of rabies; and

(d) If the animal is found to have contracted rabies during confinement, it shall properly be disposed of. (Code 1989)

Edwardsville

Chapter 2 Animal Control

ARTICLE 2.02 RABIES CONTROL

Sec. 2.02.001 Animals biting or scratching person or other animal

(a) The animal control officer or any law enforcement officer or local health officer may take up, upon private or public property, any animal which has bitten or scratched a person or other animal, and impound the animal in a veterinary hospital or animal care facility for a period of not more than 30 days, during which time the local health officer shall determine whether or not such animal is suffering from a disease and, if not, the local health officer shall authorize the release of the animal upon payment by the owner of the boarding fee therefor. The health officer may authorize the keeping of any such animal on the owner's premises if the owner produces a rabies vaccination certificate showing the animal has valid rabies vaccination protection. Impoundment costs shall be borne by the owner.

(b) If any animal impounded in accordance with subsection (a) above dies within the confinement period, regular accepted methods of necropsy examination shall be performed to insure that anyone exposed to the dog may be apprised of the absence or presence of rabies so that proper public health steps may be taken. The owner of the dog shall pay for the necropsy examination. (2005 Code, sec. 2-118)

Sec. 2.02.002 Animals bitten by rabid animal

Whenever a dog, cat or other animal is bitten by a rabid animal or an animal later proved to have been rabid, it shall be the duty of the owner of the animal that is bitten to report that fact to the local health officer and/or the police department. It shall also be the duty of the owner of the

bitten animal to either destroy or have his or her bitten animal destroyed unless the animal which was bitten had been vaccinated against rabies at least three weeks before being bitten and has a current vaccination. If the bitten animal has a current vaccination, it shall be confined for 90 days. The bitten animal shall be released from confinement only upon written order from the local health officer, who declares the animal to be free of rabies. If the animal is found to have contracted rabies during confinement, it shall be properly disposed of. (2005 Code, sec. 2-119)

Unified Government of Wyandotte County and Kansas City, KS

Chapter 7 – ANIMALS

ARTICLE IV. - ANIMAL BITES AND DISEASE CONTROL

Sec. 7-107. - Human exposure to zoonotic diseases by animals other than dogs or cats.

(a) Any bite wound by an animal other than a dog or cat exposing an individual to the possibility of rabies or other zoonotic disease (hereinafter referred to as "incident") shall be immediately reported to the director of animal control by the victim and by the owner, keeper or harborer of the animal if the incident is known to such person. Any animal bite that requires medical treatment shall be reported within 24 hours to the director of health or the director of animal control by the treating physician or hospital caring for the patient. It is the duty of the health department to promptly notify the director of animal control of any such bite reported to the police.

(b) It is unlawful for the owner, keeper or person harboring the animal involved in such incident to release it from custody, to hide or conceal such animal, or to take or allow such animal to be taken beyond the limits of the city, unless so authorized by the director of animal control, until an observation period stipulated by the state department of agriculture for the particular species of animal is over or such period is ruled unnecessary by the director of animal control.

(c) It is the duty of such owner or keeper, upon receiving notice of such incident, to immediately place the animal involved in a duly licensed veterinary medical facility, the address of which must be furnished to the director of animal control at once, or in the unified government animal shelter where such animal shall be isolated and confined for observation.

The owner or keeper of an animal involved in a biting incident is liable for the cost of confinement and observation (K.A.R. 28-1-13).

(d) The death or any suspicious change in health or behavior of any such animal undergoing observation shall be reported immediately by the observing authority to the director of health or the director's designated representative. In the event that a proper period of observation is undetermined or undeterminable for the species of animal involved in an incident, the director of health may order whatever laboratory examination of the animal or the animal's tissues is required by prudent medical practice for the protection of the victim, and no liability for damages shall arise from any injury to or the death of the animal occasioned by the laboratory examination.

(e) When an animal involved in an incident is outside the city, the director of health or the director of animal control shall forward information concerning the incident to the appropriate authority of the jurisdiction of residence of the owner, keeper or harborer or the appropriate state health department for coordinated disease prevention.

(Code 1988, § 7-61; Ord. No. O-22-03, § 1, 6-5-2003; Ord. No. O-8-15, § 1, 1-29-2015)

- **Sec. 7-108. - Domestic dog and cat bites resulting in human exposure to rabies.**

(a) Any bite wound by a dog or cat exposing an individual to the possibility of rabies or other zoonotic disease (hereinafter referred to as "incident") shall be immediately reported to the director of animal control by the victim and by the owner, keeper or harborer of the animal if the incident is known to such person.

(b) It is the duty of every owner or keeper of any dog or cat upon receiving notice or having knowledge of the involvement of his pet in a human exposure to the possibility of rabies or other zoonotic disease by biting (hereinafter referred to as "incident") to immediately

contact the director of animal control for instruction on quarantine for the biting animal. Quarantine location and period shall be regulated by the state department of agriculture, through K.A.R. 28.1.13, and any amendments thereto. However, any city police department canine and/or any assisting police canine from other law enforcement agencies involved in an incident may continue on active duty.

(c) It is unlawful for the owner harboring the animal involved in such incident to release it from custody, to hide such animal, or to take or allow such animal to be taken beyond the limits of the city, unless so authorized by the director of animal control, until the period of confinement and observation here required is completed. The owner or keeper of such animal involved in an incident shall be liable for the cost of confinement and observation.

(d) The death or any suspicious change in the health or behavior of any such dog or cat undergoing observation shall be reported as soon as possible by the observing authority to the director of animal control and the director of health or the director's designee.

(Code 1988, § 7-62; Ord. No. O-22-03, § 1, 6-5-2003; Ord. No. O-106-07, § 1(7-62), 12-17-2007; Ord. No. O-8-15, § 1, 1-29-2015)

- **Sec. 7-109. - Reserved.**

Editor's note— Ord. No. O-8-15, § 3, adopted Jan. 29, 2015, repealed the former § 7-109 in its entirety, which pertained to non-family bite violations and derived from the Code of 1988, § 7-63, and Ord. No. O-22-03, § 1, adopted June 5, 2003.

Sec. 7-112. - Confinement of animals bitten by rabid animals.

The owner of any animal known to have been bitten by a rabid animal or by an animal suspected of being rabid shall immediately notify the director of animal control. The animal shall

be confined for a period determined by the director of health, and if determined to be rabid by a licensed veterinarian, shall be destroyed immediately.

(Code 1988, § 7-66; Ord. No. O-22-03, § 1, 6-5-2003)

Appendix 3. Rabies form from Johnson County

JOHNSON COUNTY KANSAS
Health & Environment

RABIES EXPOSURE – HUMAN INVESTIGATION FORM (ANIMAL BITE)

DESCRIPTION OF INCIDENT:

_____
_____
_____
_____

ANIMAL(S) CAUSING EXPOSURE INFORMATION

Number of animals causing exposure? _____

List each animal separately:

SPECIES	COLOR / DESCRIPTION	OWNED ANIMAL	PROOF OF CURRENT RABIES VACCINATION	ANIMAL AVAILABLE FOR TESTING / OBSERVATION
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐

1) Was/were the animal(s) exhibiting signs/symptoms of rabies at the time of exposure? YES ☐ NO ☐ UNKNOWN ☐
Unusual aggression ☐ Wild animal not afraid of people ☐ Nocturnal animal active in daytime ☐
Excessive salivation ☐ Difficulty swallowing ☐ Impaired movement ☐ Paralysis ☐

2) Was it possible that the animal(s) had any contact with any potential rabies vectors? YES ☐ NO ☐ UNKNOWN ☐
Bats ☐ Skunks ☐ Raccoons ☐ Coyotes ☐ Foxes ☐ Stray Dogs ☐ Stray Cats ☐

If YES or UNKNOWN was selected for one or both of the previous questions, a Rabies Exposure may have occurred. Refer to KDHE Rabies Exposure Assessment Algorithm, Provoked Animal Bites and Rabies Exposure, and Rabies Risk Level Assessment documents if further guidance is needed.

3) DOES THIS INVESTIGATION INDICATE A POSSIBLE RABIES EXPOSURE? YES ☐ NO ☐

- If YES, complete the following actions:
  - Contact JCDHE Disease Containment at 913-826-1303.
  - Complete RABIES EXPOSURE – DETAILED INFORMATION FORM.
  - Complete RABIES EXPOSURE – ANIMAL DISPOSITION FORM.
  - Fax all completed forms to JCDHE Disease Containment at 913-826-1300.
  - Direct exposed person(s) to a healthcare provider for immediate care.
- If NO, incident does not need to be reported to JCDHE Disease Containment. Appropriate medical care for injured person(s) and/or actions by Animal Control Officers should be continued as warranted.

Johnson County Department of Health and Environment Information Only:

Date Received: _____ Case Number: _____ Epitrax Number: _____ Status: _____

Date Investigation Began: _____ Date Investigation Completed: _____ Investigator Name: _____

JCDHE 2/15

Appendix 4. Previous Wyandotte County rabies reporting form

Unified Government Public Health Department
ANIMAL BITE REPORT FORM

Fax or phone report to Disease Control & Prevention at: Fax 913-573-6744 or Phone 913-573-6712

Report Date_____ **Reporting person**_____ **Phone**_____

A. Complete this section for Potential Human Exposure to Rabies

Name_____

Birthdate_____ Age_____ Sex M F

Address_____

City/State/Zip_____

Phone_____

Owner Name_____

Address_____

City/State/Zip_____

Phone_____

Did the victim previously complete a series of rabies vaccine? Yes No

Has the victim had a tetanus vaccine within the past 5 years? Yes No

If no, tetanus vaccine is needed.

Date of exposure_____

Type of exposure: Bite Scratch

Part of body injured_____

Did the attacking animal appear healthy? Yes No

Describe events which led to exposure:

B. Complete this section for Potential Animal Exposures to Rabies

Owner Name_____

Birthdate_____ Age_____ Sex: M F

Address_____

City/State/Zip_____

Phone_____

Date of exposure_____

How many animals exposed?_____

List each animal separately:

Species	Proof of current rabies immunization	
_____	Yes	No
_____	Yes	No
_____	Yes	No
_____	Yes	No
_____	Yes	No

Veterinarian's Name_____

Address_____

City/State/Zip_____

Phone_____

Did the attacking animal appear healthy? Yes No

Describe events which led to exposure:

C. Complete this Section for the Animal(s) Causing the Exposure

Number of animals causing the exposure?_____

List each animal separately below:

Species	Proof of current rabies vaccination		Animal confined?	
_____	Yes	No	Yes	No
_____	Yes	No	Yes	No
_____	Yes	No	Yes	No

D. Disposition of Animal Causing Exposure

Check one: ☐ Dog or cat confined for 10 days Start Date _____ End Date_____

Location of confinement: ☐ Animal Shelter ☐ Veterinarian ☐ Owner

Name _____ Phone_____

Address_____

City/State/Zip _____

☐ Animal sacrificed and tested for rabies.
Test results: _____

☐ Attempting to capture animal

☐ Animal destroyed and not tested

☐ Animal not located

☐ Other_____

Comments:_____

Appendix 5. Rabies Investigation Forms

RABIES EXPOSURE DETERMINATION FORM (ANIMAL BITE) - HUMAN

Unified Government of Wyandotte County Public Health Department (UG PHD)

DESCRIPTION OF INCIDENT:

_____
_____
_____
_____

ANIMAL(S) CAUSING EXPOSURE INFORMATION

Number of animals causing exposure? _____

List each animal separately:

SPECIES	COLOR / DESCRIPTION	OWNED ANIMAL	PROOF OF CURRENT RABIES VACCINATION	ANIMAL AVAILABLE FOR TESTING / OBSERVATION
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐
_____	_____	YES ☐ NO ☐ UNKNOWN ☐	YES ☐ NO ☐	YES ☐ NO ☐

1) Was/were the animal(s) exhibiting signs/symptoms of rabies at the time of exposure? YES ☐ NO ☐ UNKNOWN ☐
   Unusual aggression ☐ Wild animal not afraid of people ☐ Nocturnal animal active in daytime ☐
   Excessive salivation ☐ Difficulty swallowing ☐ Impaired movement ☐ Paralysis ☐

2) Was it possible that the animal(s) had any contact with any potential rabies vectors? YES ☐ NO ☐ UNKNOWN ☐
   Bats ☐ Skunks ☐ Raccoons ☐ Coyotes ☐ Foxes ☐ Stray Dogs ☐ Stray Cats ☐

If YES or UNKNOWN was selected for one or both of the previous questions, a Rabies Exposure may have occurred. Refer to KDHE Rabies Exposure Assessment Algorithm and if further guidance is needed.

3) DOES THIS INVESTIGATION INDICATE A POSSIBLE RABIES EXPOSURE? YES ☐ NO ☐

- **If YES**, complete the following actions:
  - Complete RABIES INVESTIGATION FORM with all known information (form available on www.wycokck.org).
  - Contact UG PHD Communicable Disease Control at 913-573-6712 with any questions.
  - Fax completed RABIES INVESTIGATION FORM to UG PHD Communicable Disease Control at 913-573-6744.
  - Direct exposed person(s) to a healthcare provider for immediate evaluation.
- **If NO**, incident does not need to be reported to UG PHD Communicable Disease Control. Appropriate medical care for injured person(s) and/or actions by Animal Control Officers should be continued as warranted.

Unified Government Public Health Department Information Only:

Date Received: _____ Case Number: _____ Epitrax Number: _____ Status: _____

Date Investigation Began: _____ Date Investigation Completed: _____ Investigator Name: _____

UG PHD 6/16

Unified Government Public Health Department
RABIES INVESTIGATION FORM- HUMAN

Fax or phone report to Disease Control & Prevention at: Fax 913-573-6744 or Phone 913-573-6712
Please fill out form with all known information

Report Date_____ **Reporting person**_____ **Phone**_____

A. Complete this section for Potential Human Exposure to Rabies

Name_____
Birthdate_____ Age_____ Sex M F
Address_____
City/State/Zip_____
Phone_____

Veterinarian's Name_____
Address_____
City/State/Zip_____
Phone_____

Owners Name _____
Address_____
City/State/Zip_____
Phone_____

Did the victim previously complete a series of rabies vaccine? Yes No

Has the victim had a tetanus vaccine within the past 5 years? Yes No
If no, tetanus vaccine is needed.

Date of exposure_____
Type of exposure: Bite Scratch
Part of body injured_____
_____
_____

Did the attacking animal appear healthy? Yes No Was the animal bite was provoked? Yes No
Describe events which led to exposure:
_____
_____
_____

C. Complete this Section for the Animal(s) Causing the Exposure

Number of animals causing the exposure?_____
List each animal separately below:

Species	Proof of current rabies vaccination	Animal confined?
_____	Yes No	Yes No
_____	Yes No	Yes No
_____	Yes No	Yes No

D. Disposition of Animal Causing Exposure

Check one: ☐ Dog or cat confined/observed for __ days

Start Date _____ End Date_____

Location of confinement: ☐ Animal Shelter ☐ Veterinarian ☐ Owner

Name _____ Phone_____
Address
City/State/Zip _____

☐ Animal sacrificed and tested for rabies.
Test results: _____
☐ Attempting to capture animal
☐ Animal destroyed and not tested
☐ Animal not located
☐ Other

Comments:_____
_____
_____

E. Complete this Section for Exposed Humans	F. Complete this Section for Exposed Animals
Check one: ☐Person received HRIG and 4 doses of rabies vaccine *(5 doses if immunocompromised)* ☐ Person started series but did not complete series because: __ animal was not rabid __ patient refused further treatment __ patient was lost-to-follow-up ☐ Person refused to start treatment ☐Other_____ _____ _____	Check one: ☐ Animal was sacrificed. Date_____ ☐ Animal was revaccinated; and observed for 45 days because: __animal was current __dog/cat (overdue) boosted within 96 hrs __dog/cat demonstrated anamnestic response ☐ Animal vaccinated within 96 hours and quarantined for: __4 months (Dog/Cat) __6 months ☐ Other_____ _____

Notes:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name of person doing investigation:_____ Date:_____

EpiTrax Identification Number:_____

Appendix 6. Appendix of updated rabies guidelines

Advisory Committee on Immunization Practices recommendations

Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies

Recommendations of the Advisory Committee on Immunization Practices

Prepared by
Charles E. Rupprecht, VMD, PhD[1]
Deborah Briggs, PhD[2]
Catherine M. Brown, DVM[3]
Richard Franka, DVM, PhD[1]
Samuel L. Katz, MD[4]
Harry D Kerr, MD[5]
Susan M. Lett, MD[5]
Robin Levis, PhD[6]
Martin I. Meltzer, PhD[1]
William Schaffner, MD[7]
Paul R.Cieslak, MD[8]

[1]*National Center for Emerging and Zoonotic Infectious Diseases (proposed), CDC*
[2]*Kansas State University, Manhattan, Kansas*
[3]*Massachusetts Department of Public Health, Jamaica Plain, Massachusetts*
[4]*Duke University Medical Center, Durham, North Carolina*
[5]*American College of Emergency Physicians, Dallas, Texas*
[6]*Food and Drug Administration, Washington, District of Columbia*
[7]*Vanderbilt University School of Medicine, Nashville, Tennessee*
[8]*Oregon Department of Public Health, Corvallis, Oregon*

Summary

This report summarizes new recommendation and updates previous recommendations of the Advisory Committee on Immunization Practices (ACIP) for postexposure prophylaxis (PEP) to prevent human rabies (CDC. Human rabies prevention—United States, 2008: recommendations of the Advisory Committee on Immunization Practices. MMWR 2008;57[No. RR-3]). Previously, ACIP recommended a 5-dose rabies vaccination regimen with human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV). These new recommendations reduce the number of vaccine doses to four. The reduction in doses recommended for PEP was based in part on evidence from rabies virus pathogenesis data, experimental animal work, clinical studies, and epidemiologic surveillance. These studies indicated that 4 vaccine doses in combination with rabies immune globulin (RIG) elicited adequate immune responses and that a fifth dose of vaccine did not contribute to more favorable outcomes. For persons previously unvaccinated with rabies vaccine, the reduced regimen of 4 1-mL doses of HDCV or PCECV should be administered intramuscularly. The first dose of the 4-dose course should be administered as soon as possible after exposure (day 0). Additional doses then should be administered on days 3, 7, and 14 after the first vaccination. ACIP recommendations for the use of RIG remain unchanged. For persons who previously received a complete vaccination series (pre- or postexposure prophylaxis) with a cell-culture vaccine or who previously had a documented adequate rabies virus-neutralizing antibody titer following vaccination with noncell-culture vaccine, the recommendation for a 2-dose PEP vaccination series has not changed. Similarly, the number of doses recommended for persons with altered immunocompetence has not changed; for such persons, PEP should continue to comprise a 5-dose vaccination regimen with 1 dose of RIG. Recommendations for pre-exposure prophylaxis also remain unchanged, with 3 doses of vaccine administered on days 0, 7, and 21 or 28. Prompt rabies PEP combining wound care, infiltration of RIG into and around the wound, and multiple doses of rabies cell-culture vaccine continue to be highly effective in preventing human rabies.

The material in this report originated in the National Center for Emerging and Zoonotic Infectious Diseases (proposed), Lonnie King, DVM, Director.
Corresponding preparer: Charles E. Rupprecht, VMD, PhD, National Center for Emerging and Zoonotic Infectious Diseases (proposed), 1600 Clifton Road, N.E., MS G-33, Atlanta, GA 30333. Telephone: 404-639-1050; Fax: 404-639-1564; E-mail: cyr5@cdc.gov.

Introduction

Rabies is a zoonotic disease caused by RNA viruses in the family *Rhabdoviridae*, genus *Lyssavirus* (*1*). Virus is transmitted in the saliva of rabid mammals via a bite. After entry to the central nervous system, these viruses cause an acute, progressive encephalomyelitis. The incubation period usually ranges from 1 to 3 months after exposure, but can range from days to

TABLE 3. Rabies postexposure prophylaxis (PEP) schedule — United States, 2010

Vaccination status	Intervention	Regimen*
Not previously vaccinated	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent (e.g., povidine-iodine solution) should be used to irrigate the wounds.
	Human rabies immune globulin (HRIG)	Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated around and into the wound(s), and any remaining volume should be administered at an anatomical site (intramuscular [IM]) distant from vaccine administration. Also, HRIG should not be administered in the same syringe as vaccine. Because RIG might partially suppress active production of rabies virus antibody, no more than the recommended dose should be administered.
	Vaccine	Human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) 1.0 mL, IM (deltoid area†), 1 each on days 0,§ 3, 7 and 14.¶
Previously vaccinated**	Wound cleansing	All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidine-iodine solution should be used to irrigate the wounds.
	HRIG	HRIG should not be administered.
	Vaccine	HDCV or PCECV 1.0 mL, IM (deltoid area†), 1 each on days 0§ and 3.

* These regimens are applicable for persons in all age groups, including children.
† The deltoid area is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.
§ Day 0 is the day dose 1 of vaccine is administered.
¶ For persons with immunosuppression, rabies PEP should be administered using all 5 doses of vaccine on days 0, 3, 7, 14, and 28.
** Any person with a history of pre-exposure vaccination with HDCV, PCECV, or rabies vaccine adsorbed (RVA); prior PEP with HDCV, PCECV or RVA; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

of PEP. If PEP has been initiated and appropriate laboratory diagnostic testing (i.e., the direct fluorescent antibody test) indicates that the animal that caused the exposure was not rabid, PEP may be discontinued.

Vaccine Use

A regimen of 4 1-mL vaccine doses of HDCV or PCECV should be administered intramuscularly to previously unvaccinated persons (Table 3). The first dose of the 4-dose regimen should be administered as soon as possible after exposure. The date of the first dose is considered to be day 0 of the PEP series. Additional doses then should be administered on days 3, 7, and 14 after the first vaccination. Recommendations for the site of the intramuscular vaccination remain unchanged (e.g., for adults, the deltoid area; for children, the anterolateral aspect of the thigh also is acceptable). The gluteal area should not be used because administration of vaccine in this area might result in a diminished immunologic response. Children should receive the same vaccine dose (i.e., vaccine volume) as recommended for adults.

HRIG Use

The recommendations for use of immune globulin in rabies prophylaxis remain unchanged by the revised recommendation of a reduced rabies vaccine schedule. HRIG is administered once to previously unvaccinated persons to provide rabies virus-neutralizing antibody coverage until the patient responds to vaccination by actively producing virus-neutralizing antibodies. HRIG is administered once on day 0 at the time PEP is initiated, in conjunction with human rabies vaccines available for use in the United States. If HRIG was not administered when vaccination was begun on day 0, it can be administered up to and including day 7 of the PEP series (*12,25*). If anatomically feasible, the full dose of HRIG is infiltrated around and into any wounds. Any remaining volume is injected intramuscularly at a site distant from vaccine administration. HRIG is not administered in the same syringe or at the same anatomic site as the first vaccine dose. However, subsequent doses (i.e., on days 3, 7, and 14) of vaccine in the 4-dose vaccine series can be administered in the same anatomic location in which HRIG was administered.

Postexposure Prophylaxis for Previously Vaccinated Persons

Recommendations for PEP have not changed for persons who were vaccinated previously. Previously vaccinated persons are those who have received one of the ACIP-recommended pre- or postexposure prophylaxis regimens (with cell-culture vaccines) or those who received another vaccine regimen (or vaccines other than cell-culture vaccine) and had a documented adequate rabies virus-neutralizing antibody response. Previously vaccinated persons, as defined above, should receive 2 vaccine doses (1.0 mL each in the deltoid), the first dose

Public Veterinary Medicine: Public Health

Compendium of Animal Rabies Prevention and Control, 2016

National Association of State Public Health Veterinarians Compendium of Animal Rabies Prevention and Control Committee

Catherine M. Brown DVM, MSc, MPH (Co-Chair)
Sally Slavinski DVM, MPH (Co-Chair)
Paul Ettestad DVM, MS
Tom J. Sidwa DVM, MPH
Faye E. Sorhage VMD, MPH

From the Massachusetts Department of Public Health, 305 South St, Jamaica Plain, MA 02130 (Brown); the New York City Department of Health and Mental Hygiene, 2 Gotham Center, CN# 22A, 42-09 28th St, Queens, NY 11101 (Slavinski); the New Mexico Department of Health, 1190 St Francis Dr, Room N-1350, Santa Fe, NM 87502 (Ettestad); and the Texas Department of State Health Services, PO Box 149347, MC 1956, Austin, TX 78714 (Sidwa).

Consultants to the Committee: Jesse Blanton, PhD (CDC, 1600 Clifton Rd, Mailstop G-33, Atlanta, GA 30333); Richard B. Chipman, MS, MBA (USDA APHIS Wildlife Services, 59 Chenell Dr, Ste 2, Concord, NH 03301); Rolan D. Davis, MS (Kansas State University, Room 1016 Research Park, Manhattan, KS 66506); Cathleen A. Hanlon, VMD, PhD (Retired); Jamie McAloon Lampman (McKamey Animal Center, 4500 N Access Rd, Chattanooga, TN 37415 [representing the National Animal Care and Control Association]); Joanne L. Maki, DVM, PhD (Merial a Sanofi Co, 115 Trans Tech Dr, Athens, GA 30601 [representing the Animal Health Institute]); Michael C. Moore, DVM, MPH (Kansas State University, Room 1016 Research Park, Manhattan, KS 66506); Jim Powell, MS (Wisconsin State Laboratory of Hygiene, 465 Henry Mall, Madison, WI 53706 [representing the Association of Public Health Laboratories]); Charles E. Rupprecht, VMD, PhD (Wistar Institute of Anatomy and Biology, 3601 Spruce St, Philadelphia, PA 19104); Geetha B. Srinivas, DVM, PhD (USDA Center for Veterinary Biologics, 1920 Dayton Ave, Ames, IA 50010); Nick Striegel, DVM, MPH (Colorado Department of Agriculture, 305 Interlocken Pkwy, Broomfield, CO 80021); and Burton W. Wilcke Jr, PhD (University of Vermont, 302 Rowell Building, Burlington, VT 05405 [representing the American Public Health Association]).

Endorsed by the AVMA, American Public Health Association, Association of Public Health Laboratories, Council of State and Territorial Epidemiologists, and National Animal Care and Control Association.

This article has not undergone peer review.

Address correspondence to Dr. Brown (catherine.brown@state.ma.us).

Rabies is a fatal viral zoonosis and serious public health problem.[1] All mammals are believed to be susceptible to the disease, and for the purposes of this document, use of the term animal refers to mammals. The disease is an acute, progressive encephalitis caused by viruses in the genus *Lyssavirus*.[2] Rabies virus is the most important lyssavirus globally. In the United States, multiple rabies virus variants are maintained in wild mammalian reservoir populations such as raccoons, skunks, foxes, and bats. Although the United States has been declared free from transmission of canine rabies virus variants, there is always a risk of reintroduction of these variants.[3–7]

The rabies virus is usually transmitted from animal to animal through bites. The incubation period is highly variable. In domestic animals, it is generally 3 to 12 weeks, but can range from several days to months, rarely exceeding 6 months.[8] Rabies is communicable during the period of salivary shedding of rabies virus. Experimental and historic evidence documents that dogs, cats, and ferrets shed the virus for a few days prior to the onset of clinical signs and during illness. Clinical signs of rabies are variable and include inappetance, dysphagia, cranial nerve deficits, abnormal behavior, ataxia, paralysis, altered vocalization, and seizures. Progression to death is rapid. There are currently no known effective rabies antiviral drugs.

The recommendations in this compendium serve as a basis for animal rabies prevention and control programs throughout the United States and facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies control program. The compendium is reviewed and revised as necessary, with the most current version replacing all previous versions. These recommendations do not supersede state and local laws or requirements. Principles of rabies prevention and control are detailed in Part I, and recommendations for parenteral vaccination procedures are presented in Part II. All animal rabies vaccines licensed by the USDA and marketed in the United States are listed and described in Appendix 1, and contact information for manufacturers of these vaccines is provided in Appendix 2.

Modifications of note in this updated version of the compendium, compared with the previous version,[9] include clarification of language, explicit en-

observation, confinement, or strict quarantine periods of exposed animals despite previous vaccination is based in part on the potential for overwhelming viral challenge, incomplete vaccine efficacy, improper vaccine administration, variable host immunocompetence, and immune-mediated death (ie, early death phenomenon).[13,55-57]

a) Dogs, cats, and ferrets. Any illness in an exposed animal should be reported immediately to the local health department. If signs suggestive of rabies develop (eg, paralysis or seizures), the animal should be euthanized, and the head or entire brain (including brainstem) should be submitted for testing (*see* Part I.A. 10. Rabies diagnosis).

(1) Dogs, cats, and ferrets that are current on rabies vaccination should immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner's control and observed for 45 days.

(2) Dogs, cats, and ferrets that have never been vaccinated should be euthanized immediately. There are currently no USDA-licensed biologics for postexposure prophylaxis of previously unvaccinated domestic animals, and there is evidence that the use of vaccine alone will not reliably prevent the disease in these animals.[58] If the owner is unwilling to have the animal euthanized, the animal should be placed in strict quarantine for 4 (dogs and cats) or 6 (ferrets) months. Strict quarantine in this context refers to confinement in an enclosure that precludes direct contact with people and other animals. A rabies vaccine should be administered at the time of entry into quarantine to bring the animal up to current rabies vaccination status. Administration of vaccine should be done as soon as possible. It is recommended that the period from exposure to vaccination not exceed 96 hours.[59,60] If vaccination is delayed, public health officials may consider increasing the quarantine period for dogs and cats from 4 to 6 months, taking into consideration factors such as the severity of exposure, the length of delay in vaccination, current health status, and local rabies epidemiology.

(3) Dogs and cats that are overdue for a booster vaccination and that have appropriate documentation of having received a USDA-licensed rabies vaccine at least once previously should immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner's control and observed for 45 days.[39] If booster vaccination is delayed, public health officials may consider increasing the observation period for the animal, taking into consideration factors such as the severity of exposure, the length of delay in booster vaccination, current health status, and local rabies epidemiology.

(4) Dogs and cats that are overdue for a booster vaccination and without appropriate documentation of having received a USDA-licensed rabies vaccine at least once previously should immediately receive veterinary medical care for assessment, wound cleansing, and consultation with local public health authorities.

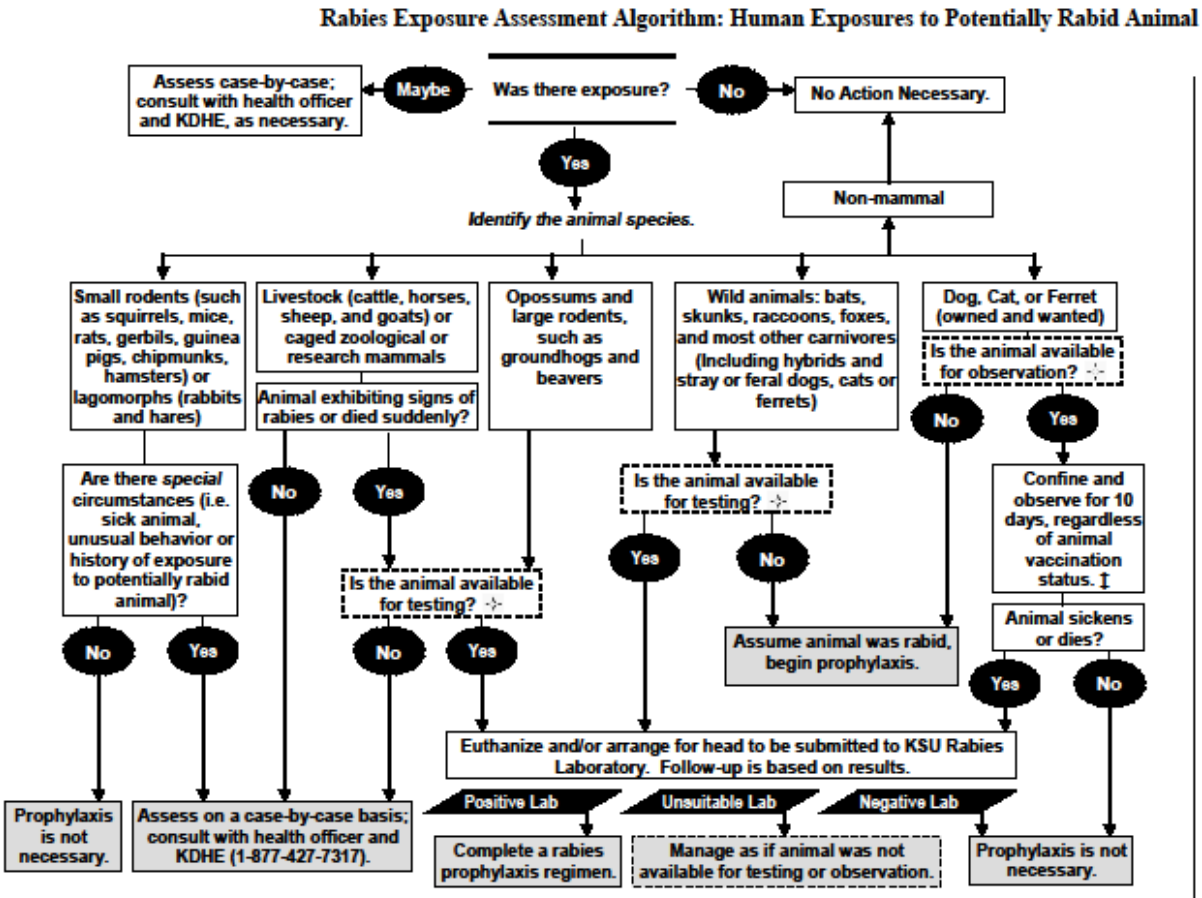
(a) The animal can be treated as unvaccinated, immediately given a booster vaccination, and placed in strict quarantine (*see* Part I. B. 5. a) (2)).

(b) Alternatively, prior to booster vaccination, the attending veterinarian may request guidance from the local public health authorities in the possible use of prospective serologic monitoring. Such monitoring would entail collecting paired blood samples to document prior vaccination by providing evidence of an anamnestic response to booster vaccination. If an adequate anamnestic response is documented, the animal can be considered to be overdue for booster vaccination (*see* Part I. B. 5. a) (3)) and observed for 45 days.[39] If there is inadequate evidence of an anamnestic response, the animal is considered to have never been vaccinated and should be placed in strict quarantine (*see* Part I. B. 5. a) (2)).

(5) Ferrets that are overdue for a booster vaccination should be evaluated on a case-by-case basis, taking into consideration factors such as the severity of exposure, time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiology, to determine need for euthanasia or immediate booster vaccination followed by observation or strict quarantine.

b) Livestock. All species of livestock are susceptible to rabies; cattle and horses are the most frequently reported infected species.[3] Any illness in an exposed animal should be reported immediately to the local health department and animal health officials. If signs suggestive of rabies develop, the animal should be euthanized, and the head or entire brain

Appendix 7. KDHE Rabies Exposure Assessment Algorithm



Appendix 8. Rabies Information Sheet

Rabies

UG Public Health Department
Communicable Disease Program
619 Ann Avenue
Kansas City, KS 66101
Phone (913) 573-6712
Fax (913) 575-6744

What is Rabies?

Rabies is a virus that only infects the nervous system of mammals, including humans.

What is Rabies Exposure?

Rabies exposure occurs when a human comes into contact with the rabies virus, mainly through a bite from a rabid animal. Exposure can also occur if the virus comes into contact with broken skin, like a scrape, or enters the eyes or mouth.

What are common sources of Rabies?

- Wildlife like bats, skunks, foxes, coyotes and raccoons are the animals most likely to get rabies. Pets like dogs, cats, or ferrets can also become infected with rabies; however, rabies can be prevented by having your pet vaccinated regularly by a licensed veterinarian. Any mammal can be a source of rabies but the ones listed above are the most common.
- Being exposed to rabies by a bat doesn't always take a bite. Exposure must be considered when there has been direct contact between a human and a bat, unless the person can be certain a bite, scratch or mucous membrane contact (eyes or mouth) did not occur. Potential exposure must also be considered if a bat is found in the same room as a person who is sleeping, mentally disabled, intoxicated, or an unattended infant or child.

What do I do if I am bitten or exposed?

- Immediately wash the area with soap and warm water.
- Contact a physician.
- Get the contact information of the owner of the pet who bit you.
- If you were bitten by a wild animal, record its location and report it to animal control.
- In the case of a bat, if possible, safely catch the bat and submit for testing.
- You can refrigerate/cool the bat, but **avoid freezing** it because this may cause it to be rejected for testing.

Rabies exposure is not a medical emergency, but it is a medical urgency!

What is Post-Exposure Prophylaxis (PEP)?

Rabies post-exposure prophylaxis is a series of four shots containing a rabies vaccine for humans. The

Rabies Information Sheet (part 2)

How can Rabies be prevented?

The best way to prevent rabies in your pets is to have them vaccinated against rabies. Avoid contact with all wild animals. Do not keep wild animals as pets. Animals which have had contact with a possible rabid animal should be reported to animal control. Any person(s) who have been bitten or otherwise exposed to an animal that might have rabies should be reported immediately to the local health department.

For further information, contact the Unified Government Health Department Communicable Disease Control program at (913) 573-6712.

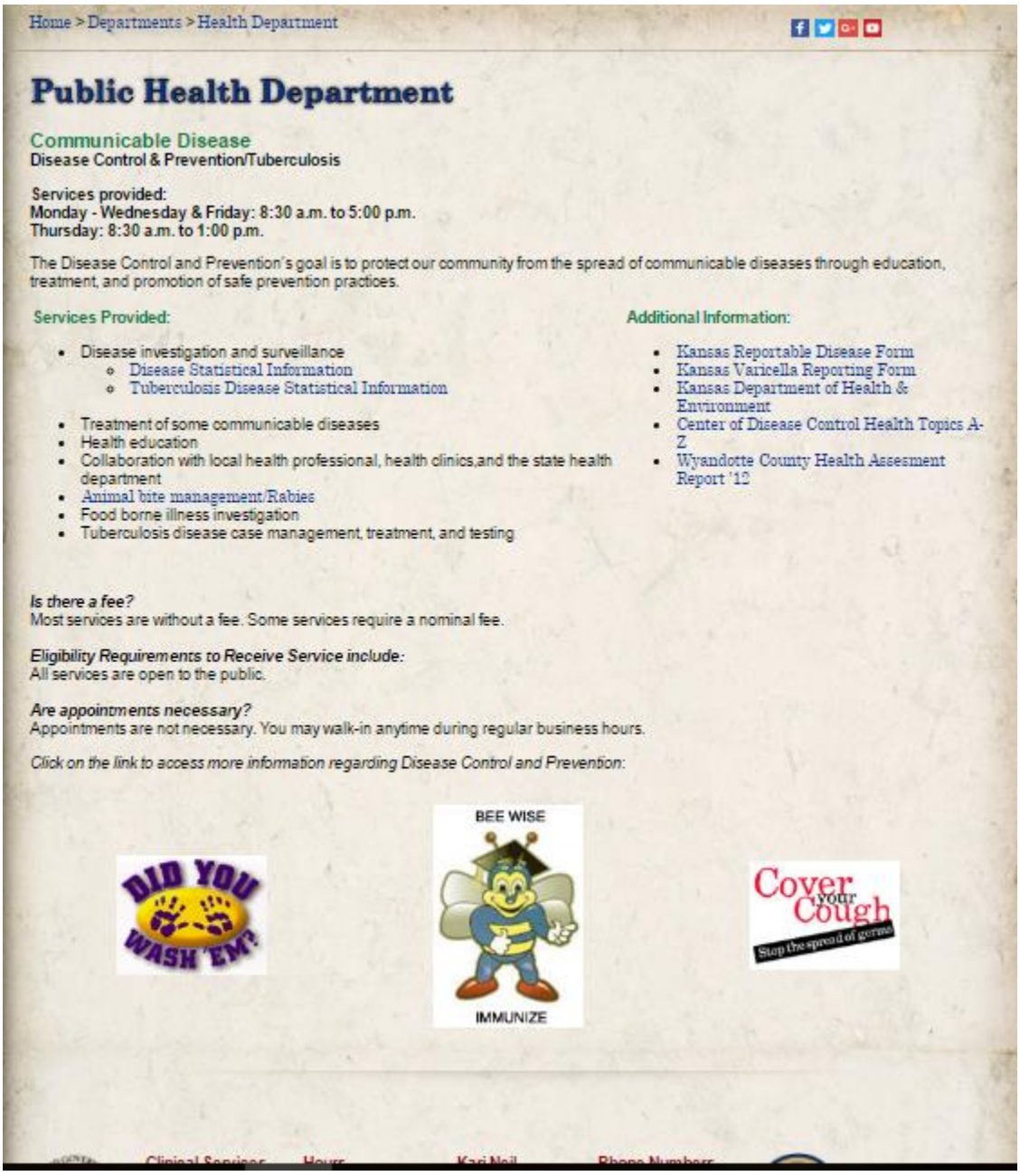
Animal Type to Post-Exposure Prophylaxis Table
Provided by Centers for Disease Control and Prevention (CDC)

Animal Type	Evaluation and Disposition of Animals	Post-Exposure Prophylaxis (PEP) Recommendations
Dogs, Cats, Ferrets	Healthy and available for a 10-day observation period	Should not begin PEP unless animal develops clinical signs of rabies
	Rabid or suspected rabid	Immediately begin PEP
	Unknown (escaped)	Consult public health officials
Raccoons, skunks, foxes, bats and most other carnivorous mammals	Regarded as rabid unless animal is proven to be negative by laboratory test	Immediately begin PEP
Livestock, horses, rodents (squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice), rabbits, hares and other mammals *These bites rarely require rabies PEP*	Consider individually on a case-by-case basis	Consult public health officials

References

CDC Rabies website: http://www.cdc/gov/rabies
KDHE Rabies Website: http://www.kdheks.gov/epi/human_animal_health.htm#rabies
World Health Organization: http://www.who.int/mediacentre/factsheets/fs099/en/

Appendix 9. Communicable Disease Webpage



Home > Departments > Health Department

Public Health Department

Communicable Disease

Disease Control & Prevention/Tuberculosis

Services provided:
Monday - Wednesday & Friday: 8:30 a.m. to 5:00 p.m.
Thursday: 8:30 a.m. to 1:00 p.m.

The Disease Control and Prevention's goal is to protect our community from the spread of communicable diseases through education, treatment, and promotion of safe prevention practices.

Services Provided:

- Disease investigation and surveillance
  - Disease Statistical Information
  - Tuberculosis Disease Statistical Information
- Treatment of some communicable diseases
- Health education
- Collaboration with local health professional, health clinics,and the state health department
- Animal bite management/Rabies
- Food borne illness investigation
- Tuberculosis disease case management, treatment, and testing

Additional Information:

- Kansas Reportable Disease Form
- Kansas Varicella Reporting Form
- Kansas Department of Health & Environment
- Center of Disease Control Health Topics A-Z
- Wyandotte County Health Assesment Report '12

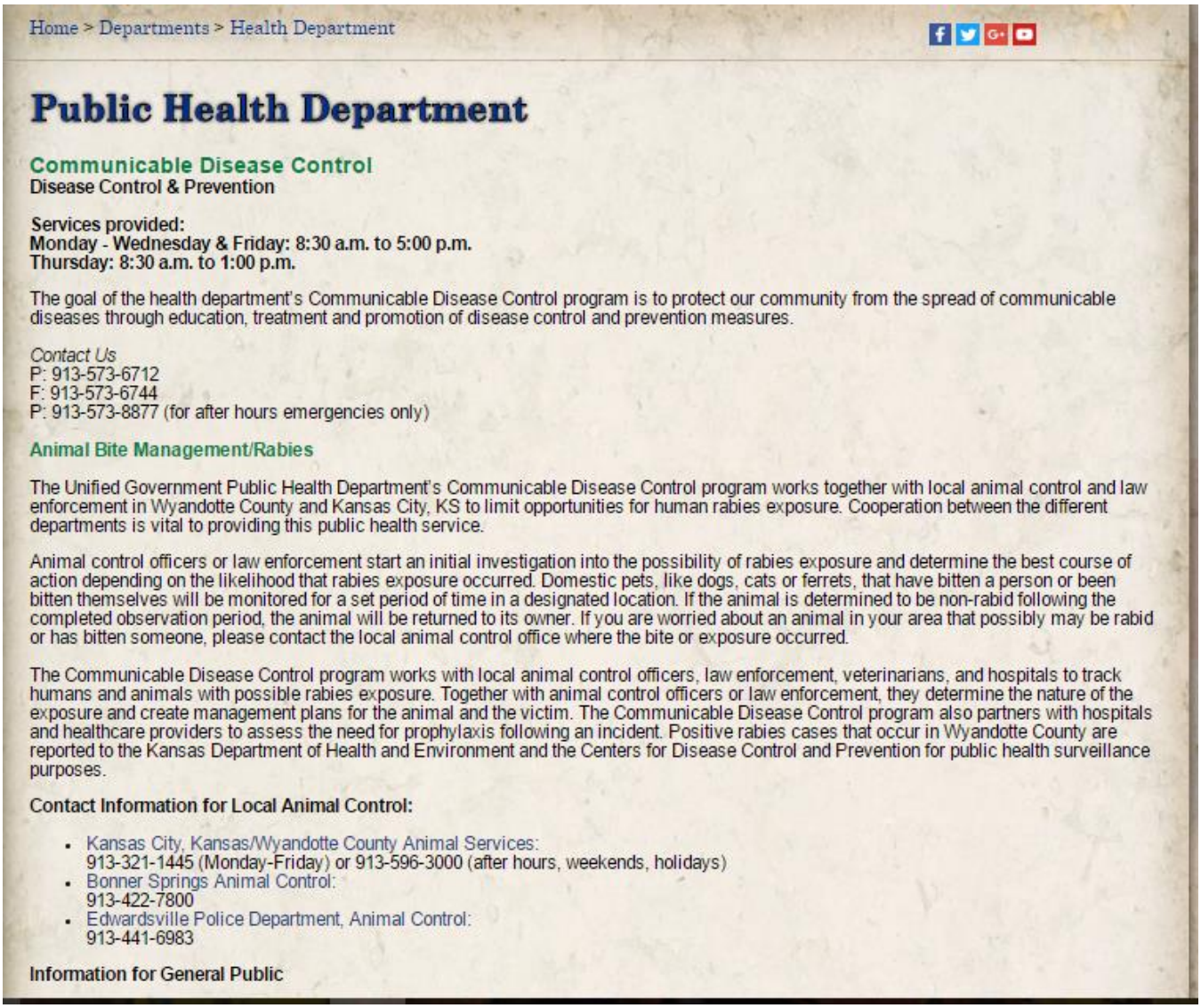
Is there a fee?
Most services are without a fee. Some services require a nominal fee.

Eligibility Requirements to Receive Service include:
All services are open to the public.

Are appointments necessary?
Appointments are not necessary. You may walk-in anytime during regular business hours.

Click on the link to access more information regarding Disease Control and Prevention:

Appendix 10. Rabies Webpage



Home > Departments > Health Department

Public Health Department

Communicable Disease Control

Disease Control & Prevention

Services provided:
Monday - Wednesday & Friday: 8:30 a.m. to 5:00 p.m.
Thursday: 8:30 a.m. to 1:00 p.m.

The goal of the health department's Communicable Disease Control program is to protect our community from the spread of communicable diseases through education, treatment and promotion of disease control and prevention measures.

Contact Us
P: 913-573-6712
F: 913-573-6744
P: 913-573-8877 (for after hours emergencies only)

Animal Bite Management/Rabies

The Unified Government Public Health Department's Communicable Disease Control program works together with local animal control and law enforcement in Wyandotte County and Kansas City, KS to limit opportunities for human rabies exposure. Cooperation between the different departments is vital to providing this public health service.

Animal control officers or law enforcement start an initial investigation into the possibility of rabies exposure and determine the best course of action depending on the likelihood that rabies exposure occurred. Domestic pets, like dogs, cats or ferrets, that have bitten a person or been bitten themselves will be monitored for a set period of time in a designated location. If the animal is determined to be non-rabid following the completed observation period, the animal will be returned to its owner. If you are worried about an animal in your area that possibly may be rabid or has bitten someone, please contact the local animal control office where the bite or exposure occurred.

The Communicable Disease Control program works with local animal control officers, law enforcement, veterinarians, and hospitals to track humans and animals with possible rabies exposure. Together with animal control officers or law enforcement, they determine the nature of the exposure and create management plans for the animal and the victim. The Communicable Disease Control program also partners with hospitals and healthcare providers to assess the need for prophylaxis following an incident. Positive rabies cases that occur in Wyandotte County are reported to the Kansas Department of Health and Environment and the Centers for Disease Control and Prevention for public health surveillance purposes.

Contact Information for Local Animal Control:

- Kansas City, Kansas/Wyandotte County Animal Services:
  913-321-1445 (Monday-Friday) or 913-596-3000 (after hours, weekends, holidays)
- Bonner Springs Animal Control:
  913-422-7800
- Edwardsville Police Department, Animal Control:
  913-441-6983

Information for General Public

- Rabies Facts & Prevention
  Information for persons who may have been exposed to rabies, and/or persons who may have questions about rabies.

Rabies Prevention Video

Information for Animal Control and Medical Providers

- Rabies Exposure Determination Form
  First form to be filled out by an animal control officer, veterinarian and/or healthcare provider to provide information needed to determine if a potential rabies exposure has occurred.
- KDHE Rabies Exposure Assessment Algorithm
- Rabies Investigation Form
  Form to be filled out by an animal control officer, Veterinarian and/or Healthcare Provider if a potential rabies exposure has occurred.
  - *Provoked bite:* Bite inflicted by a healthy animal while a human is trying to handle or feed the animal.
  - *Examples (KDHE):* Bites by an injured animal; Bites by an animal protecting "their space"; Bites by an unfamiliar or non-domesticated animal a person was interacting with

Additional Information:

- Kansas Department of Health and Environment Rabies Information
- Compendium of Animal Rabies Prevention and Control, 2016
- ACIP Vaccine Recommendations
  Guidelines for Post-exposure Prophylaxis for humans

Appendix 11. Reportable Disease Spreadsheet

Disease Name	MMWR May 2016	YTD Cases Jan-May 2016	MMWR May 2015	YTD Cases Jan-May 2015
Enteric Diseases				
Botulism				
Brucellosis				
Campylobacteriosis				
Cryptosporidiosis				
E.coli (STEC)				
Giardiasis				
Listeriosis				
Salmonellosis (Typhoid fever)				
Shigellosis				
Hepatitis Diseases				
Hepatitis A				
Hepatitis B acute				
Hepatitis B chronic				
Hepatitis B during pregnancy				
Hepatitis C				
Hepatitis E				
Respiratory Diseases				
Haemophilus influenza, invasive disease				
Influenza deaths in children <18 yrs old				
Legionellosis				
Pertussis				
Streptococcal Group A, invasive				
Streptococcal pneumonia				
Tuberculosis, active disease				
Tuberculosis, latent infection				
Vaccine Preventable Diseases				
Diptheria				
Measles				
Menigitis, bacterial				
Mumps				
Rubella				
Tetanus				
Vector-borne Diseases				
Lyme disease				

Reportable Disease Spreadsheet (pg. 2)

Rocky Mountain Spotted Fever				
Ehrlichiosis				
Total				
Total	0	0	0	0
Uncommon Diseases				
Amebiasis				
Cholera				
Cyclospora				
Hantavirus Pulmonary Syndrome				
Leprosy				
Malaria				
Meningococcemia				
Plague				
Poliomyelitis				
Psittacosis				
Q Fever				
Rabies				
SARS				
Smallpox				
Toxic Shock Syndrome				
Transmissible Spongioform Encephalopahty				
Trichinosis				
Tularemia				
Varicella				
Viral Hemorrhagic Fever				
Yellow Fever				
Total	0	0	0	0

Appendix 12. School Illness Reporting Summary for 2014-2015

Total number of schools who reported each month of the school year (2014-2015)									
	Sept 2014	**Oct 2014**	**Oct 2014**	**Dec 2014**	**Jan 2015**	**Feb 2015**	**March 2015**	**April 2015**	**May 2015**
Elementary	12	13	15	12	15	13	12	11	9
Middle	2	2	2	4	3	2	3	2	2
High	1	2	1	0	1	0	0	1	2
Total	15	17	18	16	19	15	15	14	13

Total number of schools who reported every month of the school year (2014-2015)			
	Elementary	**Middle School**	**High School**
	Delaware Ridge	Piper	None
	Junction	Turner	
	Turner		
	Open Door		
	White Church		
Total	5	2	0

Total number of schools who reported in the year (2014-2015)			
Elementary		**Middle School**	**High School**
All Saints	Mark Twain	Argentine	Turner
Bonner Springs	McKinley	Piper	Washington
Claude Huyck	Midland Trail	Turner	
Delaware Ridge	Oak Grove	West	
Douglass	Open Door		
Edwardsville	Piper		
Junction	Stony Point South		
KCK Early Childhood Center	Turner		
White Church			
Total	19	4	2

School Illness Reporting Summary for 2015-2016

Total number of schools who reported each month of the school year (2015-2016)									
	Sept	Oct	Nov	Dec	Jan	Feb	Marcy	April	May
Elementary	11	12	12	11	14	14	16	12	10
Middle	3	3	3	3	3	2	2	2	2
High	4	5	3	2	2	0	1	0	1
Total	18	20	18	16	19	16	19	14	13

Total number of schools who reported every month of the school year (2015-2016)			
	Elementary	Middle School	High School
	Frank Rushton	Turner	None
	Junction		
	Midland Trail		
	Oak Grove		
	Open Door		
	Turner		
	White Church		
Total	7	1	0

Total number of schools who reported in the year (2015-2016)			
Elementary		Middle School	High School
All Saints	Noble Prentis	Argentine	Schlagel
Banneker	Oak Grove	Northwest	Piper
Bonner Springs	Open Door	Piper	Sumner
Claude Huyck	St. Patrick	Turner	Turner
Delaware Ridge	Stony Point South		Washington
Eugene Ware	Piper		
Frank Rushton	TA Edison		
JFK	Turner		
Junction	Turner 6th grade Academy		
Mark Twain	V. Lindsay Sda		
Midland Trail	White Church		
Total	22	4	3

Appendix 13. Summary of 2015 Communicable Disease Control animal bite records

Month (2015)	Bites reported per month
February	4
March	5
April	5
May	3
June	8
July	6
August	5
September	6
November	1
December	1
total	**44**

Reporter (2015)	Count
Hospital	27
Police Department	16
School	1
Total	**44**

Hospital report per state	Count
Hospital	**27**
KS	9
MO	18
Total	**27**

Age groups of bite victims	Count
young children (1-6 yrs. old)	8
tweens/teenagers (7- 15 yrs. old)	14
young adults (16- 25 yrs. old)	3
adults (30's and 40's)	9
middle age (50's)	5
senior citizens (60's +)	**3**
unknown	1
total	**43**

Appendix 14. Summary of 2016 Communicable Disease Control animal bite records

Month (2016)	Bites reported per month
January	2
February	6
March	15
April	10
May	10
June	3
Total	**46**

Reporter (2016)	Count
Animal Control	15
Health Department	5
Hospital	22
Police Department	3
Primary Care Clinic	1
Grand Total	**46**

Hospital reports per state	Count
Hospital	**22**
KS	3
MO	19
Total	**22**

Age groups of bite victims	Count
young children (1-6 yrs. old)	8
tweens/ teenagers (7-15 yrs. old)	15
young adults (16- 25 yrs. old)	8
adults (30's - 40's)	6
middle age (50's)	3
senior citizens (60's +)	6
Total	**46**

Appendix 15. KDHE data on animal specimens submitted for rabies testing from Wyandotte County

Positive Rabies Test Species Submissions from 1989 to Present

Positive rabies test	*Year*										
Species	1989	1990	1991	1993	1994	1995	1998	2006	2007	2016	**Total**
Bat	1	1			1	1	1		1	1	**7**
Cat						1		1			2
Raccoon				1							1
Skunk			1								1
Total	1	1	1	1	1	2	1	1	1	1	**11**

Negative Rabies Test Species Submissions from 2011 to 2016

Negative rabies test	*Year*						
Species	2011	2012	2013	2014	2015	2016	**Total**
Bat	1			1	1		3
Cat	8	6	4	3	3	2	26
Dog	7	3	2	9	2	4	27
Dog	1						1
Raccoon				3	1		4
Total	17	9	6	16	7	6	**61**

Negative Rabies Test Species Submissions by City and Year

Negative test per city	*Count per year*						
Species	2011	2012	2013	2014	2015	2016	**Total**
Bat							**3**
Kansas City	1				1		
Lenexa				1			
Cat							**26**
Basehor	1						
Bonner Springs		1		1			
Edwardsville	1						
Kansas City	5	5	4	2	3	2	
Kansas City	1						
Dog							**28**
Bonner Springs		1		1			
Kansas City	8	2	2	8	2	4	
Raccoon							**4**
Bonner Springs				1			
Kansas City				2	1		

Total	**17**	**9**	**6**	**16**	**7**	**6**	**61**