RABIES EXPOSURE PROTOCOL UPDATE, EMERGENCY SUPPORT FUNCTION 11 RESOURCE DETERMINATION, AND MASS TUBERCULOSIS SCREENING FOR JOHNSON COUNTY, KANSAS

Kansas State University – Olathe
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Contact Information

• Christopher M Lewis, DVM
  – Disease Containment Intern
    • Johnson County Department of Health and Environment
      – 11875 South Sunset Drive, Suite 300, Olathe, Kansas 66061
        • christopher.lewis@jocogov.org or cmlewisdvm@gmail.com

• Nancy Tausz, RN, BSN, MPA (Preceptor)
  – Disease Containment Division Director
    • Johnson County Department of Health and Environment
      – 11875 South Sunset Drive, Suite 300, Olathe, Kansas 66061
        • nancy.tausz@jocogov.org
        • 913-826-1222
Presentation Overview

Scope of Work

Individual Projects
  Background
  Learning Objectives
  Activities Performed

MPH Program Competencies

Observations and Conclusions
Scope of Work

**Johnson County Department of Health and Environment (JCDHE)**
- Rabies Exposure Protocol Update
- Mass Tuberculosis Screening

**Johnson County K-State Research and Extension Office**
- Emergency Support Function 11 Resource Determination
Johnson County, Kansas
- Population: 566,933 (2013)
  - Under 18 years old: 25.6%
  - 18-65 years old: 62.2%
  - Over 65 years old: 12.2%
- Area: 477 square miles
- 20 cities / towns

Kansas City Metro Area (MSA)
- Population: 2,035,000 (2010)
- Area: 7857 square miles
- 14 counties across Kansas and Missouri
Johnson County Demographics

- Johnson County, Kansas
  - Race
    - White alone: 87.8%
    - Hispanic or Latino: 7.4%
    - Black/African American alone: 4.9%
    - Asian alone: 4.6%
    - Two or more races: 2.3%
    - American Indian/Alaskan Native alone: 0.4%

- Median Household Income: $74,717
  - Only 6.5% of residents below poverty level
  - National Poverty Rate was 14.5% in 2013

US Census Bureau
Johnson County Demographics

• In 2010 – Population Without Insurance Coverage (Age 18-64)
  – 12.1% in Johnson County
  – 18.2% in United States

Johnson County Resources

• 6 Major Hospitals
• 66 Nursing Homes
• 340 Parks
• >1500 Restaurants Operating

jocogov.org
Preceptors

- **Liz Ticer**
  - Public Health and Emergency Preparedness Coordinator and Program Manager
    - Johnson County, 2005-2015
  - Public Health Emergency Planner
    - Wyandotte County, 2003-2005
  - Accepted position as Emergency Management Coordinator in Grapevine, Texas
    - February 2015

- **Nancy Tausz, RN, BSN, MPA**
  - Disease Containment Division Director
    - Johnson County, 1999-present
  - Immunization Program Manager
  - Immunization Program Staff Nurse
Johnson County Offices

• Health Division – Olathe Clinic
  – 11875 South Sunset Drive, Suite 300
    Olathe, Kansas 66061

• Health Division – Mission Clinic
  – 6000 Lamar Avenue, Suite 140
    Mission, Kansas 66202

• K-State Research and Extension
  – 11811 South Sunset Drive, Suite 1500
    Olathe, Kansas 66061
Rabies Exposure Protocol Update
Background on Rabies

- Single-stranded RNA virus
  - Bullet-shaped
- Family *Rhabdoviridae*, genus *Lyssavirus*
- Only infects Mammals
- Multiple species-associated variants
  - Canine, raccoon, bat, fox, skunk
Rabies Exposure Protocol Update

Background on Rabies

• Worldwide Problem
  – As many as 55,000 people die each year
    • 95% of deaths in Africa and Asia
    • 40% of deaths are children under 15 years old
  
  – Estimated 15,000,000 people receive Post-Exposure Prophylaxis (PEP) each year
  
  – Case Fatality Rate almost 100%
    • Most deadly of all known viruses
  
  – Disproportionately high risk levels in low-income, rural communities and countries

World Health Organization website
Rabies Exposure Protocol Update
Background on Rabies

- US and Johnson County
  - Only 1-2 deaths per year across the US
  - Last death in Kansas was in 1968
Rabies Exposure Protocol Update

Background on Rabies

1. Virus Inoculation – Bite or open wound
2. Replication – Within muscle tissue
3. Binding – Virus binds to nerve receptors
4. Axonal Spread – Peripheral nerves to spinal cord
5. Replication/Ascent – Spinal cord to brain
6. Infection – Encephalitis causing neuro symptoms
7. Centrifugal Spread – Along nerves to salivary glands and other tissues
Rabies Exposure Protocol Update

Learning Objectives

• “To learn about and describe the relationship between Kansas statutes related to public health and zoonotic disease issues (most notably, rabies) and local (i.e., municipal and county-level) ordinances related to public health and zoonotic disease issues (i.e., rabies).”

• Accomplished by comparing Kansas statutes pertaining to the management of rabid animals and rabies exposures to city animal codes of same nature
Rabies Exposure Protocol Update
Anticipated Activities

1) To review current statutes and procedures regarding rabies exposure and prevention

2) To consult with relevant stakeholders to determine if revisions were needed

3) To determine if any other statutes or procedures pertaining to rabies and public health needed to be reevaluated
Rabies Exposure Protocol Update
Activities Performed

- Participated in meetings with JCDHE Disease Containment staff to determine needs and expectations of project
  - Tiffany Geiger – JCDHE Disease Investigator for Rabies
  - Cathy Shemwell – JCDHE Disease Containment Program Manager
  - Nancy Tausz – JCDHE Disease Containment Division Director
  - Problem: Animal Control Agency/Officer contact information was outdated
  - Problem: Inconsistent reporting of rabies exposure cases
    - Only Rabies Exposures need reported to JCDHE
    - Reports received often incomplete, on outdated forms, or not received at all
  - Problem: Animal Control Officers and Veterinarians wanted some guidance on what constitutes a rabies exposure
Rabies Exposure Protocol Update
Activities Performed

• Updated Animal Control Agency/Officer Contact List
  – Confirmed information via e-mails and phone calls
  – PDF created after completion, then distributed to stakeholders

• Compiled/Compared Animal Codes from Johnson County Cities
  – Most were easily accessed from each city’s website
  – PDF of compiled codes created

• Created Johnson County Rabies Exposure Protocol
  – Modeled from AVMA, NASPHV, KDHE, and Johnson County Animal Bite Procedure
  – Reviewed by JCDHE staff including the JCDHE Health Officer
  – PDF created and distributed to stakeholders
Rabies Exposure Protocol Update
Activities Performed

• Created RABIES EXPOSURE Forms
  – Human Investigation Form (Animal Bite)
  – Detailed Information Form
  – Animal Disposition Form
  – Human Disposition Form
• All based on info requested from CDC, KDHE, JCDHE
• Converted into fillable PDF forms to ease completion, storage, and submittal by investigators
• Distributed to Animal Control Officers, DVMs, hospitals, then posted on updated JCDHE Rabies website
Rabies Exposure Protocol Update
Activities Performed

• Provided Rabies Exposure Decision-Making and Support Documents
  – Rabies Exposure Assessment Algorithm
    • From KDHE Rabies Disease Investigation Guidelines document
  – Provoked Animal Bites and Rabies Exposure
    • Created to help define provoked bites for investigating officers, veterinarians, and hospital staff
  – Rabies Risk Level Assessment
    • Adapted from North Carolina Rabies Control Manual

• Updated Rabies Brochure
  – Updated existing JCDHE Rabies Brochure
Rabies Exposure Protocol Update
Activities Performed

• Updated Johnson County Department of Health and Environment Rabies Website
  – Podcast explaining changes made to RABIES EXPOSURE forms
  – Summary of Rabies Exposures and Testing protocols for JCDHE
  – List of Johnson County Animal Control Offices

• Sent Mass E-mail to Johnson County Animal Control Officers and DVMs
  – Explanation of changes to protocol and forms
  – PDFs of new Protocol, RABIES EXPOSURE forms, rabies exposure decision-making documents, Animal Control Contact List, and links to website and forms
Emergency Support Function 11 Resource Determination
ESF 11 Resource Determination
Background on ESF 11

• National Preparedness Goal – first in 2003, latest in 2011
  – First issued by President George W. Bush on December 17, 2003
    • Prepare for response to natural or man-made disasters or emergencies

• Pet Evacuation Transportation Standards Act (PETS Act) – 2006

• Post-Katrina Emergency Management Reform Act (PKEMRA Act) – 2006

• National Response Framework (NRF) – 2008

All above amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act – 1988
ESF 11 Resource Determination
Background on ESF 11

• “Emergency Support Functions (ESFs) is the grouping of governmental and certain private sector capabilities into an organizational structure to provide support, resources, program implementation, and services that are most likely needed to save lives, protect property and the environment, restore essential services and critical infrastructure, and help victims and communities return to normal following domestic incidents.”
  – The Public Health Emergency Department of the US Department of Health and Human Services (HHS)

• 15 Different Emergency Support Functions
  – Transportation; Communications; Public Works and Engineering; Firefighting; Information and Planning; Mass Care, Emergency Assistance, Temporary Housing, and Human Services; Logistics; Public Health and Medical Services; Search and Rescue; Oil and Hazardous Materials; Agriculture and Natural Resources; Energy; Public Safety and Security; Long-Term Community Recovery (later superseded); and, External Affairs
ESF 11 Resource Determination
Background on ESF 11

• National ESF 11 – Agriculture and Natural Resources Annex
  – Five Primary Functions
    • Provide nutrition assistance
    • Respond to animal and plant disease and pests*
    • Ensure the safety and security of the commercial food supply
    • Protect natural and cultural resources and historic properties
    • Provide for the safety and well-being of household pets*

• Johnson County ESF 11 – Agricultural, Animal Welfare, and Natural Resources
  – Animal Welfare Appendix
  – Foreign Animal Disease Appendix
ESF 11 Resource Determination
Background on ESF 11

Coordinating Agency: Johnson County K-State Research and Extension

- **Animal Welfare Support Agencies**
  - Community Animal Shelter
  - Volunteer Groups
  - JC Dept. Parks and Recreation
  - JC Dept. Public Works
  - Jurisdictional Animal Control
  - Jurisdictional Fire Departments
  - Jurisdictional Law Enforcement
  - KCVMA
  - Johnson County Animal Response Team (JoCART)

- **Foreign Animal Disease Support Agencies**
  - Animal Welfare Support Agencies, plus
  - Johnson County Appraiser
  - Johnson County Legal Department
  - JC Dept. Planning and Development
  - JC Dept. Health and Environment
  - Johnson County Sheriff’s Office
  - Jurisdictional HAZMAT Teams
  - KS Dept. Agriculture
  - KS Dept. Health and Environment
  - KS Dept. Transportation
  - KS Highway Patrol
ESF 11 Resource Determination
Learning Objectives

• “Develop an understanding of emergency response procedures and how organization of available resources will improve the efficiency of those procedures.”

• Achieved by studying the ESF 11 functions for Johnson County and discussing the benefits of resource determination and organization with stakeholders.
ESF 11 Resource Determination
Anticipated Activities

1) To contact relevant stakeholders in Johnson County to determine and list resources available in an emergency situation

2) Expected to begin the project but, due to ongoing nature of such an activity, would not finish the project
ESF 11 Resource Determination
Activities Performed

• Created ESF 11 Contact List
  – Merged Emergency Managers/Emergency Response Organizations list with Animal Control Agency/Officer List from Rabies Project
  – Converted to PDF and distributed to stakeholders

• Consulted with ESF 11 Leaders
  – Rick Miller – Johnson County K-State Research and Extension Office
  – Cary Gerst – Johnson County Department of Emergency Management
  – Eric Thompson – Code 3 Associates
  – Brad Miller – Johnson County Animal Response Team (JoCART)
ESF 11 Resource Determination

Activities Performed

• Compiled lists of current and needed resources
  – Lists created by previously mentioned ESF 11 leaders

• Created Emergency Support Function 11 Resource Survey
  – Fillable PDF form e-mailed to agencies/officers on ESF 11 Contact List as well as Johnson County veterinarians

• Created ESF 11 Survey Resource List with PDFs
  – Based on responses to ESF 11 Resource Survey
  – Embedded respondents’ PDFs within document
Mass Tuberculosis Screening
Mass Tuberculosis Screening
Background on Tuberculosis

• *Mycobacterium tuberculosis* (TB)
  – Rod-shaped, non-motile, acid-fast, slow-growing bacterium

• TB Infection (Latent)
  – Bacteria present in body but not active
  – Not contagious to others

• TB Disease (Active)
  – Bacteria actively multiplying within body
  – Contagious with pulmonary or laryngeal forms of disease
  – May develop months to decades after infection
  – Only 5-10% of infections become active disease
Mass Tuberculosis Screening
Background on Tuberculosis

- Worldwide Problem
  - In 2013, 9,000,000 people developed TB disease
    • 1,500,000 people died from disease
  - 95% of Deaths in poor or middle income countries
    • Africa, Southwest Asia, Western Pacific

Estimated TB Incidence Rates - 2010
Mass Tuberculosis Screening
Background on Tuberculosis

• US Statistics (CDC 2013)
  – 9582 TB Disease cases reported
  – 3.0 cases / 100,000 persons
  – In 2011, 536 deaths from TB disease

• Kansas Statistics (KDHE 2012)
  – 42 TB Disease cases reported
  – 1.46 cases / 100,000 persons

• Johnson County Statistics (JCDHE 2012-2014)
  – 7.6 TB Disease cases reported (3 yr avg)
  – 1.4 cases / 100,000 persons
  – 109 confirmed and probable TB infections reported (3 yr total)
  – 19.2 infections / 100,000 persons
Mass Tuberculosis Screening
Background on Tuberculosis

• Bacteria spread through air
  – When person with active disease talks, coughs, sneezes, or sings

• Lung Disease (70-80% of cases)
  – Prolonged cough, hemoptysis, fever, severe night sweats, appetite loss

• Disease can also develop in:
  – Lymph nodes, bones and joints, kidneys, bladder, brain and meninges, and chest wall
Mass Tuberculosis Screening
Background on Tuberculosis

**Screening Tests**

- **Tuberculin Skin Test**
  - Tuberculin injected intradermally in forearm
  - Check for presence and size of reaction 48-72 hours later
  - Indicates infection, does not determine if active disease

- **TB Blood Test**
  - Utilizes interferon-gamma release assays (IGRAs) to measure individual’s immune response to TB bacteria
    - QuantiFERON-TB Gold In-Tube Test (QFT-GIT)
    - T-SPOT.TB Test (T-Spot)
  - Indicates infection, does not determine if active disease
Diagnostic Tests

- Thorough Medical History
- Complete Physical Examination
- Chest Radiographs
- Microscopic Evaluation of Sputum Smear
- Culture of Sputum*
  - Positive culture indicates individual is infectious
  - Antibiotic Sensitivity testing of positive sputum culture
    - Determine if drug resistance is present
    - Guide medications used for treatment
Mass Tuberculosis Screening
Learning Objectives

- Mass screening was an unexpected event, so no learning objectives were established at beginning of Field Experience

- Never want an event like this to occur, but it is an excellent learning opportunity when does occur
Mass Tuberculosis Screening
Activities Performed

- Participated in some JCDHE planning meetings prior to screening

- Attended information forum for parents of students before screening

- Performed duties of Field Observer during screening
  - Helped with set-up and take-down of equipment and supplies
  - Recorded observations before, during, and after the event
  - Relayed information between various groups of workers
MPH Program Competencies
**MPH Program Competencies**

**Most Beneficial Courses**

- MPH 754  Introduction to Epidemiology
- DMP 753  Zoonosis and Preventive Medicine
- DMP 705  Veterinary Immunology
- DMP 712  Veterinary Bacteriology and Mycology
- HMD 720  Administration of Health Care Organizations
- KIN 818  Social and Behavioral Bases of Public Health
Observations and Conclusions
Observations and Conclusions
Challenges Encountered in Government-based Work

- Large Size
- Tiered Command Structure
- Lack of Interagency Cooperation (at times)
- Disconnect Between Different Levels of Government
- Adverse Effects of Budget Cuts
- Waiting for Responses
Observations and Conclusions
Advantages of Being a Veterinarian

• Skill and Knowledge Sets
  – Veterinary School
  – Practice Experience

• Improved Cooperation
  – Animal Control Officers
  – Veterinarians
  – Government Officials

• Membership in Veterinary Organizations

• Appreciation for Daily Activities of JCDHE
Observations and Conclusions
Public Health Practices

• Importance of Communication
  – Within and Between Departments

• Providing Quality Information to General Public
  – Improve Understanding without Causing Fear

• Vaccination Programs
  – Herd Immunity
  – Rabies and Measles – Possible Similarities?

• Disease Eradication Programs
  – Rabies vs. TB – different strategies
References and Images

- Unites States Census Bureau - [http://quickfacts.census.gov/qfd/states/20/20091.html](http://quickfacts.census.gov/qfd/states/20/20091.html)
- Statens Serum Institut - [http://www.ssi.dk/Bestill/SF%20Diagnostica/Produkter%20fra%20SS%20Diagnostica/Immunoassays/GFT%20Gold%20In%20Tube.aspx](http://www.ssi.dk/Bestill/SF%20Diagnostica/Produkter%20fra%20SS%20Diagnostica/Immunoassays/GFT%20Gold%20In%20Tube.aspx)
- TBFACTS.org - [http://tbfacts.org/drug-susceptibility.html](http://tbfacts.org/drug-susceptibility.html)
- Cayuhoga County Board of Health - [http://www.cchlh.net/oral-rabies-vaccine](http://www.cchlh.net/oral-rabies-vaccine)
Any Questions?
Thank You!

- MPH Committee
  - Dr. Justin Kastner
  - Dr. Paige Adams
  - Dr. Abbey Nutsch
  - Dr. Patricia Payne

- MPH Preceptors
  - Liz Ticer
  - Nancy Tausz

- Johnson County Staff
  - Cathy Shemwell
  - Tiffany Geiger
  - Rick Miller
  - Cary Gerst
  - Jennifer Dunlay
  - Amy Showalter
  - Andrew Conyers
  - Shari Tedford