Kentucky
Cabinet for Health Services
Department for Public Health
Division of Epidemiology & Health Planning
Epidemiologic Notes & Reports

Volume 37 Number 5 June 2002

# Tick Borne Diseases in Kentucky

By
Sue K. Billings, DVM, MSPH
Division of Epidemiology and Health Planning

Spring and warmer weather not only bring forth budding flowers and trees but also increased risk of exposure to ticks that are in high grass and areas with underbrush. Humans are an accidental host and the majority of ticks are not infected with any organism harmful to humans. The history of a tick bite, when and where it occurred, and the length of time the tick was attached are all very important items in the patient history when considering a tick borne disease. Submission of ticks to the Kentucky Department for Public Health for identification will also help build a database of ticks associated with specific diseases in Kentucky.

**Ehrlichiosis HME**—Human monocytic ehrlichiosis, first recognized in the United States in 1987, is caused by the intracellular bacterium, *Ehrlichia chaffeensis,* and is mainly in the south central, southeastern, and mid-Atlantic states, and California. *E. chaffeensis* is maintained in a zoonotic cycle with white-tailed deer and ticks. The lone star tick, *Amblyomma americanum,* in Figure 1, is the principal vector to humans, but the American dog tick, *Dermacentor variabilis*, in Figure 2, is also a vector. Both of these ticks are prevalent in Kentucky.

Presenting symptoms of fever, malaise, and headache are accompanied by chills, myalgia, nausea, and anorexia in many patients. Even though the symptoms are non-specific on the onset, HME can be a life-threatening illness. Patients often have thrombocytopenia, leukopenia, and anemia, with 40% to 62% requiring hospitalization.

**Lyme Disease**—Lyme disease is caused by a spirochete, *Borrelia burgdorferi*, that is transmitted to humans through the feeding of the deer tick, *Ixodes scapularis,* usually the nymph stage. Transmission of the organism requires a tick attachment of at least 24 hours or longer. *I. scapularis* normally feeds on the white-footed mouse, white-tail deer, other mammals, and birds. Over 90% of the Lyme disease cases nationwide are reported from northeastern, mid-Atlantic, or north central states. There are only a few confirmed reports of *I.scapularis* in the state of Kentucky.

Lyme disease often presents with a "bull's eye rash," or erythema migrans, a fever, malaise, fatigue, headache, and other non-specific symptoms. Disseminated infection may involve the neurologic, musculoskeletal, or cardiac systems with both early and late manifestations.

**STARI—**A new tick borne illness that causes a rash similar to Lyme disease has recently been described in southeastern and south-central states. This illness, named Southern tick-associated rash illness (STARI), is associated with the bite of *A. americanum,* the lone star tick. All life stages of the lone star tick aggressively bite people.

**Figure 1.** ***A. americanum***

Current research indicates the organism involved is a spirochete, which has been given the name *Borrelia lonestari.*

**Rocky Mountain Spotted Fever—**Rocky Mountain spotted fever (RMSF) is caused by the rickettsia, *Ricksettsiae rickettsii*, that was first described over a century ago. The tick vector and reservoir host for the eastern United States is the American dog tick and in the western states it is the Rocky Mountain wood tick. The risk of exposure is low because only 1% to 3% of the tick population carries R*. ricketsii.* The tick requires 4 to 6 hours of attachment and feeding before the ricksettsia are released from the salivary glands.

*(Continued on Page 2)*

***This Issue…..***

Tick Borne Diseases in Kentucky……..1
Grants Support Bioterrorism Preparedness……...3
Statewide Advisory Committee on Bioterrorism……. 3
Emergency Department Visits Increase……4
New Funds To Improve Birth Defect Surveillance …..4
Cases of Selected Reportable Diseases in Kentucky…5

## Tick Borne Diseases in Kentucky

*(Continued from Page 1)*

Symptoms for RMSF patients are nonspecific, including sudden onset of high fever, with nausea, vomiting, malaise, headache, and muscle pain. The characteristic maculopapular rash usually appears on the third to the fifth day, beginning on the extremities, including the soles and palms. Prompt treatment usually prevents complications and fatalities; however 3% to 5% of RMSF patients still die from the infection.

**Figure 2.** ***D. variabilis***

In the two-year period 2000-2001 the KDPH received approximately 163 laboratory reports and/or case reports with RMSF titers of 1:64 or a positive index titer. Possible cases from that group were not included in our database due to lack of convalescent titers, collaborative history, or return of the case report.

**Tularemia**—Tularemia, commonly known as "Rabbit Fever," is not only zoonotic, but also is a possible bioterrorism agent. The bacteria, *Francisella tularensis*, may be transmitted to man through several vectors, ticks, flies, or mosquitoes. Numerous animals serve as reservoir hosts. People may also be infected by handling carcasses of infected animals, from eating infected meat, drinking contaminated water, or through inhalation from contaminated soil, hay, or grain. The American dog tick and the lone star tick are both vectors in Kentucky.

The symptoms that develop depend on the entry of the organism into the body. The most common presentation from a tick, fly, or mosquito bite is an ulcer at the site and regional swelling of lymph nodes. Ingestion produces gastrointestinal problems and inhalation produces pneumonia or primary septicemia. Pneumonia may complicate the illness from any mode of entry.

In the last three years, 1999-2001, 4 of the 10 confirmed cases have been in children 4 years or younger in age. All of these cases have a history of a tick bite.

**Babesiosis** is also a tick borne protozoa infection that should be reported as an unusual occurrence in Kentucky.

Cases of tick borne diseases in Kentucky for the years 1997 through 2001 are summarized in the table below.

### Cases of Tick Borne Diseases in Kentucky

| | Ehrlichiosis HME | | Lyme Disease | | RMSF | | Tularemia | |
|---|---|---|---|---|---|---|---|---|
| YEAR | Confirmed Cases | Probable Cases | Confirmed Cases | Probable Cases | Confirmed Cases | Probable Cases | Confirmed Cases | Probable Cases |
| 1997 | 2 | 0 | 21 | 4 | 5 | 11 | 1 | 0 |
| 1998 | 2 | 0 | 26 | 4 | 6 | 7 | 0 | 2 |
| 1999 | 2 | 3 | 19 | 1 | 3 | 6 | 3 | 2 |
| 2000 | 3 | 2 | 13 | 0 | 4 | 11 | 3 | 1 |
| 2001 | 3* | 6 | 23 | 0 | 2 | 11 | 4 | 4 |

Case determinations made using the "Case Definitions for Infectious Conditions Under Public Health Surveillance" in the MMWR Recommendations and Reports, May 2, 1997/Vol. 46/RR-10.
* One ehrlichiosis unspecified included.

**Tick Removal**—Ticks should be removed with care, as infective secretions or feces may contaminate the area. Wear gloves and/or use tweezers, grasp the tick as close to the skin as possible, and gently but firmly pull straight out. The bite site should be washed well with soap and water before applying antiseptic.

**Tick Identification**—Submit specimens in a well sealed plastic vial with county and date information to: Cathy Mahl, Kentucky Department for Public Health, Mailstop HS1E-C, 275 East Main St., Frankfort, KY 40621-0001. Any *Ixodes scapularis* identified will be submitted to CDC for pathogen testing.

# Federal Grants Support Bioterrorism Preparedness for Public Health and Hospitals

The Department for Public Health's initial work plan to increase Kentucky's bioterrorism preparedness through a $13.9 million federal grant was submitted to the Department of Health and Human Services (DHHS) on April 15.

The Centers for Disease Control and Prevention (CDC) will administer the "cooperative agreement award," which is aimed at upgrading Kentucky's public health system preparedness for and response to bioterrorism. A work plan to enhance the state's hospital preparedness was also submitted April 15 for a separate $1.8 million grant. The hospital grant will be administered through the Health Resources and Services Administration (HRSA).

The CDC funding will go to upgrade state and local public health readiness and response to bioterrorism, as well as to other outbreaks of infectious disease, and other public health threats and emergencies. The funds will be released to the state upon CDC approval of the work plan and will cover a budget period through August 30, 2003. Funds have been requested in the next federal budget to continue this effort.

The bioterrorism work plan is composed of six major areas, including: preparedness planning and assessment; surveillance and epidemiology capacity; laboratory capacity-biologic agents; Health Alert Network/ communications and information technology; risk communication and health information dissemination; and education and training.

Funding from the HRSA grant will be used to develop and implement regional plans to improve the capacity of hospitals and health systems to respond to a public health emergency. A needs assessment is underway to determine the hospitals' current level of preparedness.

Although the Department for Public Health will administer the grants at the state level, the process will involve a cooperative effort from other local and state agencies, such as local health departments and communities, the Governor's office, the Office of Homeland Security, and the Division of Emergency Management. These entities were consulted in drafting the initial work plan and will continue to be involved in its refinement and execution.

According to Kentucky Public Health Commissioner Rice C. Leach, MD, the funding will not only increase the state's readiness to respond to bioterrorism or other emergency situations, but will also strengthen Kentucky's overall public health system. "We look forward to working closely with our local and state partners throughout this process," Leach said.

Kentucky will receive the $15 million as part of $918 million allotted to the states through Department of Defense emergency supplemental appropriations earmarked for recovery from and response to terrorist attacks on the U.S. For more information on the grants, visit the CDC website at http:www.bt.cdc.gov/Planning/CoopAgreementAward/index.asp.

## Statewide Advisory Group Guides Bioterrorism Plan

A Bioterrorism Advisory Committee has been appointed by Public Health Commissioner Rice Leach, MD, to offer guidance as Kentucky's plan is further developed and carried out. The 38-member committee held its initial meeting April 30 in Frankfort. Members are:

Richard Clover, MD, Associate Vice President, University of Louisville School of Medicine; Nancy Kern, RN, and Carol Grider, Disaster/Emergency Services, American Red Cross; Larry Collier, Executive Director, Ky. Fire Commission/Fire Rescue Training; John W. Poe, DVM, Ky. Veterinary Medical Association; and Norb Ryan, ADA Coordinator, Cabinet for Workforce Development.

Other members are Robin Bennett, KAMFES, Environmental Health Supervisor, Barren River District Health Dept.; Dudley Conner, Executive Director, Ky. Public Health Association; F. Douglas Scutchfield, MD, Director, University of Kentucky School of Public Health; and Douglas W. LeFebvre, Lexington Veterans Administration Hospital.

Additional committee members are Vivian Lasley-Bibbs, State Specialist for Health, Cooperative Extension Program, Ky. State University; Judy Jones, Hazard Office of Rural Health; Rodney Murphy, Director, Telecommunications Services, Governor's

*(Continued on Page 6)*

## Visits to Hospital Emergency Departments Increase Nationwide

***Highlights from the National Center for Health Statistics Survey, 2000***

The latest national data on the use of hospital emergency departments show that there were 108 million visits in 2000, up 14% from 95 million visits in 1997. Because the number of hospitals providing emergency care decreased from 4,005 to 3,934 between 1997 and 2000, the number of annual visits per emergency department increased about 16% (from 24,000 in 1997 to 27,000 in 2000). Additionally, waiting time for non-urgent visits during the period increased 33%, according to a report released in late April by the Centers for Disease Control and Prevention (CDC).

The most seriously ill or injured patients (with needs deemed emergent) continued to get care about as quickly in 2000 as in 1997. However, for non-urgent visits, patients on average waited approximately 68 minutes to see the doctor, up from 51 minutes in 1997.

The increase in visits to the emergency department is a result of overall population growth, as well as increases in the number of seniors. Older Americans (those 75 years of age and over) had the highest rate of emergency department visits—65 visits per 100 persons per year. The national average was 39 visits reported for every 100 persons per year. Use of the emergency department varied by other patient characteristics as well. For instance, the African-American population used the emergency department at a rate 67% higher than the rate of the nation's white population in data collected during the most recent survey year.

Stomach and abdominal pain, chest pain, and fever were the most commonly recorded reasons for a visit to the emergency department. Since 1997, an increase in visits with a primary diagnosis of chest pain or abdominal pain was found for women aged 45 and over. In 2000, there were 1.3 million visits due to adverse drug reactions or other complications from medical care.

Persons aged 15 to 24 years had the highest injury visit rate. The most frequently recorded injury diagnoses were open wounds (18%) and the most commonly mentioned injured body site was the hand, wrist, and fingers category, which accounted for 13%.

The survey found that in the year 2000, medications were used in 74% of all visits, virtually unchanged from 1999. There were an average of 1.6 drugs used or prescribed per emergency department visit. Since 1997, drug prescription rates increased for persons 15-44 years of age. Medication for pain relief was the most frequent class of drug administered during the time.

Approximately 14% of patients arrived at the emergency department by ambulance. About 16% of the visits were deemed to be emergent, requiring the patient to be seen within 15 minutes of arrival. Another 31% of the visits were classified as urgent enough for the patient to need to see the doctor within an hour. Approximately 12% of the patients seen in the emergency department during the survey period were admitted to the hospital.

The CDC's National Center for Health Statistics conducts an annual survey of visits to the emergency department as part of its National Health Care Survey, which also covers doctors' offices, nursing homes, hospices, and home health care. The National Hospital Ambulatory Medical Care Survey is a national probability survey of visits to hospital emergency departments of non-federal, short-stay, and general hospitals in the United States. Its report may be viewed or downloaded at www.cdc.gov/nchs.

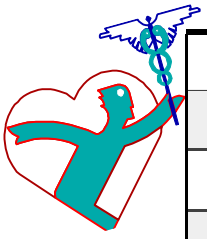
## Funds Awarded for Birth Defects Surveillance

Kentucky was among 20 states named this spring to receive funding for improved birth defects surveillance. The state's Cabinet for Health Services is being awarded $179,488 by the Centers for Disease Control and Prevention (CDC) as part of a $3.2 million program to better monitor birth defects, the leading cause of infant mortality in the United States.

The funds will enable public health programs to develop, implement, and/or expand community-based birth defects tracking systems and programs that work to prevent defects. The funding also will support activities to improve access to health services for children with birth defects.

According to the CDC's National Center on Birth Defects and Developmental Disabilities, birth defects account for more than 20% of all infant deaths in the nation. Funding improved surveillance will contribute to better understanding the prevalence and changing trends in birth defects and will monitor the effectiveness of nationwide prevention efforts, the agency noted.

# Cases of Selected Reportable Diseases in Kentucky
## (YTD Through April for Each Year)



| Disease | 2002 | 2001 | 5 year median |
|---|---|---|---|
| AIDS | 110 | 113 | 104 |
| Chlamydia | 2902 | 2832 | 2634 |
| Gonorrhea | 1126 | 1091 | 1091 |
| Syphilis (Prim. and Sec.) | 31 | 15 | 32 |
| Group A Streptococcus | 5 | 16 | 9 |
| Meningococcal Infections | 5 | 13 | 13 |
| *Haemophilus influenzae*, invasive | 2 | 1 | 5 |
| Hepatitis A | 25 | 16 | 16 |
| Hepatitis B | 14 | 18 | 18 |
| E. coli O157H7 | 3 | 3 | 7 |
| Salmonella | 82 | 75 | 82 |
| Shigella | 52 | 115 | 52 |
| Tuberculosis | 40 | 31 | 31 |
| Animal Rabies | 9 | 7 | 9 |
| Motor Vehicle Injury Deaths | 266 | 238 | 243 |

| Vaccine Preventable | 2002-To Date | Total in 2001 |
|---|---|---|
| Diphtheria | 0 | 0 |
| Measles | 0 | 2 |
| Mumps | 4 | 3 |
| Pertussis | 12 | 96 |
| Polio | 0 | 0 |
| Rubella | 0 | 0 |
| *Streptococcus pneumoniae* | 8 | 28 |
| Tetanus | 0 | 0 |

### Influenza Statistics For Confirmed Isolates Influenza Season (October-May)

| Type | 2001-2002 Through April 30 | 2000-2001 Total # |
|---|---|---|
| A | 224 | 65 |
| B | 5 | 58 |
| Unknown | 0 | 1 |

***KENTUCKY EPIDEMIOLOGIC NOTES & REPORTS***
Printed With State Funds
by the
Commonwealth of Kentucky
Cabinet for Health Services
Department for Public Health
275 East Main Street
Frankfort, Kentucky 40621

*Kentucky Epidemiologic Notes and Reports*, a monthly publication, is available without charge to subscribers. Although materials may be reproduced without permission, we appreciate acknowledgement. For more information call 502-564-3418. Visit our Website: http://publichealth.state.ky.us/newsletters pub.htm

**Rice C. Leach, MD**,
Commissioner, Department for Public Health
**Steven J. Englender, MD, MPH,**
State Epidemiologist and Director,
Division of Epidemiology and Health Planning
**Molly M. Cone**, Editor

**RETURN SERVICE REQUESTED**

PRSRT STD
U.S. Postage Paid
Lexington, KY
Permit No. 1

## Statewide Bioterrorism Advisory Committee Named

*(Continued from Page 3)*

Office of Technology; Tim Stump, KHDA, Buffalo Trace District Health Department; Martin Evans, MD, University of Kentucky Medical Center; David W. Jones, Executive Director, State Medical Examiner's Office; Ruth M. Carrico, PhD, RN, University of Louisville Hospital; Tom Armstrong, Department for Local Government; Henry Spiller, Director, Ky. Regional Poison Control Center; Len Puthoff, St. Elizabeth Medical Center; Donna R. Collins, RN, Office of Aging; Chase Forrester, JD, Director, KATS Network; and Barry Meade, MS, DVM, U. S. Department of Agriculture.

Other Bioterrorism Advisory Committee representatives are Ed Hall, DVM, Ky. Department of Agriculture; Barbara Reynolds, MD, Ky. Medical Association; Major Rob Miller, Kentucky State Police; Anthony Russell, Director, Education and Training, Ky. Labor Cabinet; Earl Motzer, PhD, Ky. Hospital Association; Colonel Earl Gray, Department for Fish and Wildlife; Renell Grubbs, Ky. Community Crisis Response Board; and Ralph Collins, Ky. Natural Resources and Environmental Protection Cabinet.

Rounding out the committee are Timothy L. Veno, President, Ky. Association of Homes and Services for the Aging; Brian Bishop, Executive Director, Emergency Medical Services; William S. Smock, MD, University of Louisville Medical Center; Marcia Montgomery, Health and Safety Coordinator, American Red Cross; Lisa C. Baker, MD, Medical Director, Portland Family Health Center; Ray Nelson, Military Affairs, Office of Security Coordination; Ronn Padgett, Military Affairs, Ky. Emergency Management; and Pat Payne, President, Ky. Society for Clinical Laboratories.