

# International Symposium Focuses on Emerging Infectious Diseases and Bioterrorism

More than 400 veterinary faculty, physicians, public health professionals and scientists exchanged scientific information and preparedness strategies December 5 and 6, 2002, at the *International Symposium on Emerging Infectious Diseases and Bioterrorism: Regional Threats, Global Impact*, held at UC Davis.

Speakers outlined the nature of numerous disease agents and issues surrounding their potential for being intentionally introduced through terrorist acts. Topics included smallpox, bovine spongiform encephalopathy (BSE, or mad cow disease), plague, arthropod-borne diseases (including West Nile encephalitis), pandemic influenza, and a host of pathogens—some as widely feared as *Ebola* and others still unfamiliar to most members of the public, such as *Rickettsia*.\*

The symposium emphasized a single theme—preparedness for medical response to an intentionally caused epidemic requires the same approach as preparedness for naturally occurring disease outbreaks.

Keynote speaker Donald Henderson, who led the worldwide effort to eradicate smallpox in the 1970s, illustrated why, like AIDS, other contagious, fatal diseases could spread silently around the globe:

■ The world has more population centers: in 1952, only London and New York had more than 7.5 million people; in 2000, 28 cities had 7.5 million, with six cities having populations of more than 15 million people.

■ Many of these cities are located in subtropical regions where poverty, overcrowding and poor nutrition contribute to disease.

■ Unprecedented numbers of travelers move regularly to all parts of the world, and from virtually uninhabited areas to huge population centers.

■ Global food trade is a factor in the spread of infectious diseases.

While *Ebola* or plague evoke great fear, more insidious public health threats already exist. Society's long-term

reliance on antibiotic therapies also causes renewed concern about antibiotic-resistant strains of diseases such as tuberculosis.

Some diseases are frightening because no cure or vaccine exists; some strike fear because of horrible symptoms; and some can linger undetected, spreading to others before symptoms occur. The zoonotic infections—diseases that can be transmitted from animals to humans—warrant close scrutiny by veterinary and public health professionals. West Nile encephalitis virus, for example, is spread by birds that can fly anywhere, making surveillance difficult.

The long incubation period of BSE was cited as one reason for the difficulty in diagnosing it in animals or humans until the disease's latest stages, compared to other infectious threats such as plague or smallpox. Researchers are exploring the role of the species barrier and indirect forms of transmission between species—but scientists are challenged to find a cure for BSE and other prion\* diseases, because proposed treatments or preventive strategies take years to evaluate.

Influenza A, which killed 20-40 million people—many of them otherwise young, healthy individuals—in the pandemic of 1918, still mystifies researchers, who continue to study the genetic structure of influenza strains and their presence in animal populations that act as natural reservoirs of the disease.

Other diseases such as plague, West Nile encephalitis (present in 43 states at the end of 2000) and related viruses are arthropod-borne—spread by fleas, ticks or mosquitoes.

Bruno Chomel, professor of zoonoses at the school, pointed out that rickettsial diseases—such as Rocky Mountain spotted fever and tularemia—are potential candidates for bioterrorism.

According to Dr. Chomel, pathogens that might be used for bioterror would have a high rate of infection at low dosages, especially as an aerosol; stable infectivity; be communicable person-to-person; encounter little or no

immunity among the target population; cause a serious or fatal disease; create fear among the public; and be difficult or impossible to treat.

Several rickettsial organisms meet many of these criteria, said Dr. Chomel, who also noted that to protect public health, more diagnostic tools are needed for early detection of rickettsial diseases, and that vaccine developers need to include multiple strains of *Rickettsia*.

National and regional surveillance programs and diagnostic methods play a vital role in prevention and control of infectious diseases. For example, federal and regional surveillance systems have been improved since 1999 to monitor West Nile encephalitis, which has traveled steadily westward since its discovery in New York.

Dr. Henderson said that \$1 billion had been sent to states “to build state and local strength” in the public health infrastructure—state governments will have broad discretion on how they spend the money. They will measure their response plans against 17 benchmarks and report progress to the Department of Health and Human Services in June 2003.

Kevin Reilly (DVM, MPVM, 1988), deputy director for Prevention Services with the California Department of Health Services, communicated the state's perspective on public health response to the threat of bioterrorism.

R. Steven Tharratt (MPVM 2001), professor at the UC Davis School of Medicine, discussed emergency preparedness in California, where the existing response structure already includes fires, earthquakes, floods and civil unrest—a public health component is now being added.

Public health officials responsible for controlling disease outbreaks in animals and people cite as their priorities—for both response and research programs—the ability to rapidly detect new and emerging diseases.

\* *Rickettsia*: bacteria transmitted by arthropod bites

\* Prions: protein particles present in brain tissue