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One Health: From ideas to implementation, rhetoric to reality

Washington—February 17, 2011--The convergence of people, animals, and our environment has created a new dynamic in which the health of each group is inextricably and globally interconnected, without borders. It is against this background that One Health has emerged as a multidisciplinary effort to attain optimal health of humans, animals and our environment.

This is the focus of a session at the annual meeting of the American Association for the Advancement of Science entitled "One Health: From Ideas to Implementation, Rhetoric to Reality" which takes place on Sunday, February 20, 2011 from 1:30 to 4:30 PM in the Washington, DC Convention Center in Room 207A.

Emerging zoonotic diseases, food- and water-borne diseases, and environmental change pose increasing threats to health on a global basis. Improvements are needed in our ability to detect and respond to emerging zoonotic agents, particularly those that appear suddenly and are capable of spreading over large areas. The emergence of diseases is a huge public health threat everywhere, especially now that we are able to travel to almost any place in the world in a day. This session will focus on implementing One Health principles via monitoring and surveillance at the human-animal-environment interface.

Participants are Ronald Atlas, University of Louisville; Larry Madoff, University of Massachusetts; Stanley Maloy, San Diego State University; Tracey S. McNamara, Western University of Health Sciences; and Stephen S. Morse, Columbia University. The session, sponsored by the American Society for Microbiology, will also include an overview report from the 1st International One Health Congress being held in Melbourne, Australia, Feb.14-16, 2011.

Most new human diseases are transmitted from animals, often following disruption of the environment. Although the health of humans, animals, and the environment are inextricably interconnected, practices in human and veterinary medicine and environmental impact rarely recognize these linkages.

In 1999, the presence of West Nile virus was heralded by dead and dying crows. However, it took two and one half months before a definitive diagnosis was reached. Why? West Nile presented a challenge to the United States because the disease crossed species boundaries and demonstrated the near absence of interagency contingency planning for zoonotic diseases.

Given that most of recent emerging infectious diseases have been zoonoses and most of those have been related to wildlife, have we closed the gaps in wildlife and non-regulatory species biosurveillance? According to a recent Institute of Medicine report, Sustaining Global Surveillance and Response to Emerging Zoonotic Diseases (2009), the committee was "unable to identify a single example of a well-functioning, integrated zoonotic disease surveillance system across human and animal sectors." Many policy papers have come out in the past decade, all of which urge the need for a more integrated approach to biosurveillance and yet little has changed. Wildlife agencies continue to be poorly funded and undermanned. Veterinary involvement with wildlife agencies at the state and federal level is poor, which negatively affects the ability of those agencies to conduct disease surveillance. Species that fall outside of the mission statement of the USDA still fall between the cracks although they have historically served as sensitive urban biosentinels. Some recent efforts aimed at closing these gaps will be discussed in this session.

One institution that expressly deals with veterinary and human health is ProMED-mail (the Program for Monitoring Emerging Diseases, <http://www.promedmail.org>), an internet-based service devoted to the early detection of infectious disease outbreaks around the world, which includes animal diseases as part of its purview. In the mid-1990's, ProMED (the international Program for Monitoring Emerging Diseases, now part of the International Society for Infectious Diseases), and its e-mail listserv ProMED-mail (currently with >40,000 subscribers in at least 185 countries), were initiated to plan and promote such global surveillance. ProMED reports on human diseases, zoonotic diseases and diseases that affect sources of human nutrition (both plants and livestock animals).

ProMED has always included the veterinary community, both among its staff and as participants in its reporting system. Currently, 12 of ProMED's 31 subject-expert and regional moderators are veterinary health specialists. Over 20% of ProMED's 53,000 participants subscribe to one or more of its email lists specializing in animal health issues. A retrospective study of ProMED from 1996-2004 showed that over 10,000 reports during this 9-year interval concerned animal health issues. Approximately 30% of these related to zoonotic disease in humans; the remainder dealt strictly with animal disease outbreaks both in wildlife and domesticated animals including livestock. Nearly half of the animal diseases reported were caused by viral pathogens, the most likely category to emerge or re-emerge.

The "One Health" approach facilitates integrating surveillance activities across species to allow data to be placed in context and permits early warning of important changes in characteristics such as host range or geographic distribution. In a major development, in 2009 the U.S. Agency for International Development (USAID) began the "Emerging Pandemic Threats" (EPT) program, which includes PREDICT, a project to build global capacity for surveillance and prediction of novel infections that have pandemic potential. EPT/PREDICT uses the "One Health" approach to target and integrate surveillance in wildlife, livestock, and humans, and develop a framework for risk assessment. These approaches are enabled by improved understanding of factors driving infectious disease emergence, and new technological capabilities for modeling and informatics, diagnostics and pathogen identification, and communications (e.g., disease reporting using cellphones).

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