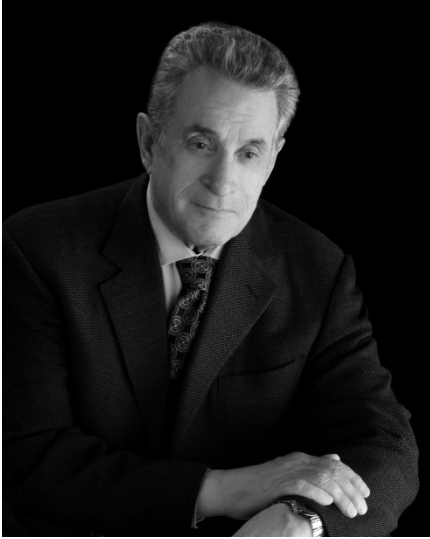


Microbial Forensics: The Nexus of Public Health and Law Enforcement



2013 ESE Distinguished Alumnus Award Winner

Stephen A. Morse

Associate Director for Environmental Microbiology
National Center for Emerging and Zoonotic Infectious Diseases
Centers for Disease Control and Prevention

November 1, 2013

2:00 pm

Blue Cross Blue Shield Auditorium
0001 Michael Hooker Research Center

ABSTRACT

The dissemination of spores of *Bacillus anthracis* through the U.S. mail had a disastrous impact on human health, society, and the economy. As a result, the entirely new discipline of microbial forensics was developed to help with the criminal investigation. Few are aware of this development, especially of its significant value behind the scenes in tracking down perpetrators of what might be termed “high tech crime,” namely those who employ a biological agent. Fortunately, the field of microbial forensics did not have to be developed de novo. The foundations for this field were based on epidemiologic investigations of emerging and recurring infectious diseases. The deliberate dissemination of a biological agent via a number of different routes, including air, water, food, and infected vectors, presents the latest challenge to public health. This deliberate dissemination may be either obvious (anthrax letters) or covert (food borne outbreaks). With few exceptions, a careful epidemiological investigation will be required to determine whether an outbreak of infectious disease is due to intentional release of an agent or is naturally occurring. Important considerations in the investigation of acute outbreaks of infectious disease include: (i) determining that an outbreak has in fact occurred; (ii) defining the population at risk; (iii) determining the method of spread and/or reservoir; and, (iv) characterizing the agent. During the past 40 years, a number of molecular methods have been developed for subtyping microorganisms that have been shown to complement the epidemiologic investigation as well as identify related cases. From a law enforcement perspective, ascertaining the identity and physical properties of a deliberately released biological agent is paramount, in responding to public health and security threats and in identifying the source of the agent. While molecular epidemiology and microbial forensics share many characteristics, the extent of validation for microbial forensic methods and how resulting data are interpreted so that they can be used in a court of law are considerably more complex. This talk will highlight the use of microbial forensics in the investigation of a number of biological events.

BIO

Dr. Morse attended graduate school at the School of Public Health, University of North Carolina at Chapel Hill where he received his M.S.P.H. ('66) in environmental chemistry and biology and a Ph.D. ('69) in microbiology. In 1984, he joined the Centers for Disease Control and Prevention (CDC) as Director of the Sexually Transmitted Diseases (STDs) Research Program, National Center for Infectious Diseases (NCID); and in 1996, became the Associate Director for Science of the newly created Division of AIDS, STDs and Tuberculosis Laboratory Research. From 1999 - 2007, he served as the Associate Director for Science, Division of Bioterrorism Preparedness and Response where he worked on national and international bioterrorism-related issues. In 2008, he became the Associate Director for Environmental Microbiology, CDC. He also has an appointment to the Senior Biomedical Research Service of the U.S. Public Health Service. He is currently a Director of the Public Health Foundation of the University of North Carolina.

