

Assessing the Risk from Biological Threats: A Government/Academia Partnership for Homeland Security

Reliable risk assessments are necessary for government agencies and emergency response personnel to quickly evaluate and communicate real and potential risks for high-priority natural or man-made microbiological threats.

The results of this research will arm policymakers and first responders with the information they need to protect lives and set decontamination goals.

Background

In 2005, EPA and the Department of Homeland Security (DHS) established a jointly-funded Center for Advancing Microbial Risk Assessment (CAMRA) at Michigan State University—in partnership with six other universities—to enhance the conduct of risk assessments needed to support homeland security objectives. The Center is a consortium of leading academic scientists with extensive expertise in microbial risk assessment methods and infectious disease transmission through environmental exposures. CAMRA is addressing research to fill critical data gaps in credible risk assessments for decontamination of microbiological threats. The research being conducted is developing creative methods to assess the risk of exposure to pathogens in air, water, soil, and on hard surfaces in both indoor and outdoor environments.

Why is This Research Important?

Shortly after the September 11, 2001, attacks on the World Trade Center and the Pentagon, letters containing anthrax bacteria were mailed to the news media and two U.S. Senators. Five of the 22 people infected with anthrax died. Three post offices were contaminated from processing the letters, two of which did not reopen until late in 2003 and the third not until March 2005. Decontamination of the Brentwood, MD, post office cost approximately \$130 million, and the Hamilton, NJ, post office decontamination cost approximately \$65 million. EPA also spent approximately \$42 million to decontaminate the government buildings in Washington, DC. Because limited data existed about *B. anthracis* and decontamination procedures, EPA used general industrial hygiene concepts and an experienced-based public health approach. The



procedures available at the time were hampered due to the lack of sufficiently sensitive detection equipment for dangerous biological agents. This incident changed the perception of both the likelihood of a biological attack and of its potential consequences. It also demonstrated the gaps in the understanding of how microbes behave when they are used as weapons. The better the fate of pathogens in human environments is understood, the better the abilities to counteract bioterrorism will be.

U.S. EPA Office of Research
and Development
Washington, DC 20460
EPA/600/F-06/005
February 2006

What is the Research?

The new Center has two primary goals:

- A technical mission to develop models, tools, and information to be used to reduce or eliminate health impacts from the deliberate indoor or outdoor use of biological agents of concern; and
- A practical mission to develop a national network for information transfer about microbial risk assessment among universities, professionals, and communities.

Major issues CAMRA is addressing include:

- The degree to which the standard methods currently used in chemical risk assessments can apply to pathogens;
- The extent to which the methods and models that have been developed for food-borne and/or waterborne pathogens can be used to assess homeland security risk;
- Improved methods and models for bridging key gaps in dose response information; and
- An examination of the need for specific risk assessment methods for certain pathogens.

Anticipated Outcomes

The results of this research will give government agencies and first responders improved knowledge and tools to rapidly identify and ascertain the consequences of exposure to dangerous microbial agents. This research will also identify potential health effects from exposure to both deliberate and accidental releases of biological agents.

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