

Missouri Responds to Multi-State *E. Coli* Outbreak

Laboratory and epidemiologic investigations are crucial to rapidly identify the source of disease outbreaks.



Missouri contributed to the laboratory response in the 2006 *E. coli* outbreak in spinach, the largest foodborne disease outbreak

in the United States since 1993. Prior to the cooperative agreement, the Missouri State Public Health Laboratory (MSPHL) did not have adequate staff, equipment, or communication systems to rapidly respond to an event the size of the 2006 outbreak. Now, MSPHL provides a wide variety of testing 365 days per year.

During the outbreak, trained staff were able to rapidly confirm the strain type of all *E. coli* specimens sent to the laboratory, determine if they matched the strains associated with the national spinach *E. coli* investigation, and establish that the *E. coli* strains in Missouri were not part of the national outbreak. MSPHL also received specimens quickly because of the new statewide courier service. Parallel laboratory and epidemiologic investigations were crucial in identifying the source of this outbreak. Concurrent collection of case information

by epidemiologists in affected states and sharing of data between states and CDC led to rapid identification of the suspected food source and targeted public health action.

According to the Missouri Department of Health and Senior Services, the cooperative agreement is valuable because it has allowed the state to hire staff, purchase new equipment, draft guidances, and prepare training and educational opportunities for its workforce. Missouri has been able to create the Center for Emergency Response and Terrorism to work on issues related to preparedness caused by natural or deliberate events. Its staff have received invaluable training in disaster response that was put to great use during the response to Hurricane Katrina.

Snapshot of Public Health Preparedness

Below are activities conducted by Missouri in the area of public health preparedness. They support CDC preparedness goals in the areas of detection and reporting, control, and improvement; crosscutting activities help prepare for all stages of an event. These data are not comprehensive and do not cover all preparedness activities.

Disease Detection and Investigation

The sooner public health professionals can detect diseases or other health threats and investigate their causes and effects in the community, the more quickly they can minimize population exposure.

Detect & Report	Could receive and investigate urgent disease reports 24/7/365 ¹	Yes
	- Primary method for receiving urgent disease reports* ²	Telephone
	Linked state and local health personnel to share information about disease outbreaks across state lines (through the CDC <i>Epi-X</i> system) ³	Yes
	Conducted year-round surveillance for seasonal influenza ⁴	Yes

* Telephone, fax, and electronic reporting are all viable options for urgent disease reporting, as long as the public health department has someone assigned to receive the reports 24/7/365.

¹ CDC, DSLR; 2005; ² CDC, DSLR; 2006; ³ CDC, *Epi-X*; 2007; ⁴ HHS, OIG; 2007



Missouri



Public Health Laboratories

Public health laboratories test and confirm agents that can threaten health. For example, advanced DNA “fingerprinting” techniques and subsequent reporting to the CDC database (PulseNet) are critical to recognize nationwide outbreaks from bacteria that can cause severe illness, such as *E. coli* O157:H7 and *Listeria monocytogenes*.

Detect & Report	Number of Missouri laboratories in the Laboratory Response Network ¹	1
	Rapidly identified <i>E. coli</i> O157:H7 using advanced DNA “fingerprinting” techniques (PFGE): ²	
	- Number of samples received (partial year, 9/06 – 2/07)	29
	- Percentage of test results submitted to CDC database (PulseNet) within 4 days	93%
	Rapidly identified <i>Listeria monocytogenes</i> using advanced DNA “fingerprinting” techniques (PFGE): ²	
	- Number of samples received (partial year, 9/06 – 2/07)	None
	- Percentage of test results submitted to CDC database (PulseNet) within 4 days	N/A
	Had a laboratory information management system that could create, send, and receive messages ³ (8/05 – 8/06)	No
	- System complied with CDC information technology standards (PHIN) ³ (8/05 – 8/06)	N/A
Had a rapid method to send urgent messages to frontline laboratories that perform initial screening of clinical specimens ³ (8/05 – 8/06)	Yes	
Crosscutting	Conducted bioterrorism exercise that met CDC criteria ⁴ (8/05 – 8/06)	Yes
	Conducted exercise to test chemical readiness that met CDC criteria ⁴ (8/05 – 8/06)	Yes

¹ CDC, DBPR; 2007; ² CDC, DSLR; 2007; ³ APHL, Public Health Laboratory Issues in Brief: Bioterrorism Capacity; May 2007; ⁴ CDC, DSLR; 2006

Response

Planning provides a framework for how a public health department will respond during an emergency. The plans can be tested through external reviews, exercises, and real events. After-action reports assess what worked well during an exercise or real event and how the department can improve.

Control	Developed a public health response plan, including pandemic influenza response, crisis and emergency risk communication, and Strategic National Stockpile (SNS) ^{1,2}	Yes
	Missouri SNS plan reviewed by CDC ²	Yes
	- Score on CDC technical assistance review (1-100)	85
	Number of Missouri cities in the Cities Readiness Initiative ³	2
Crosscutting	Developed roles and responsibilities for a multi-jurisdictional response (ICS) with: ¹ (8/05 – 8/06)	
	- Hospitals	Yes
	- Local/regional emergency management agencies	Yes
	- Federal emergency management agencies	Yes
	Public health department staff participated in training to support cooperative agreement activities ⁴	Yes
	Public health laboratories conducted training for first responders ⁵ (8/05 – 8/06)	Yes
	Activated public health emergency operations center as part of a drill, exercise, or real event* ⁶ (partial year, 9/06 – 2/07)	Yes
Conducted a drill or exercise for key response partners to test communications when power and land lines were unavailable ⁶ (partial year, 9/06 – 2/07)	No	
Improve	Finalized at least one after-action report with an improvement plan following an exercise or real event ⁶ (partial year, 9/06 – 2/07)	Yes

* Activation means rapidly staffing all eight core ICS functional roles in the public health emergency operations center with one person per position. This capability is critical to maintain in case of large-scale or complex incidents, even though not every incident requires full staffing of the ICS.

† States were expected to perform these activities from 9/1/2006 to 8/30/2007. These data represent results from the first half of this period only.

¹ CDC, DSLR; 2006; ² CDC, DSNS; 2007; ³ CDC, DSNS CRI; 2007; ⁴ CDC, DSLR; 1999-2005; ⁵ APHL, Chemical Terrorism Preparedness; May 2007; ⁶ CDC, DSLR; 2007