

Yellow fever epidemic presents 200-year-old lesson in crisis management

July 28 2014, by Stephanie Koons

Among natural and man-made disasters, there is perhaps nothing more baffling and terrifying than an infectious disease outbreak. In 1793, a yellow fever epidemic in Philadelphia killed about 5,000 people and altered the course of history. According to Ed Glantz, a senior lecturer at Penn State's College of Information Sciences and Technology (IST), an outbreak could wreak similar havoc in modern times, and emergency response systems may not be much better prepared than they were over 200 years ago.

"I actually believe a lot of those terrible outcomes could happen today," said Glantz, who teaches in the Security and Risk Analysis (SRA) program at the College of IST.

A paper that Glantz wrote on the topic, "Community Crisis Management Lessons from Philadelphia's 1793 Epidemic," won the Best Insight Paper Award at the 11th International Conference on Information Systems for Crisis Response and Management (ISCRAM), which was held recently at the College of IST. The theme for ISCRAM2014 was empowering citizens and communities through information systems for crisis response and management. The conference focused on the local community, the individual and the technologies that can be employed to improve crisis response at the local level.

According to Glantz's paper, public health organizations, including the Centers for Disease Control and Prevention (CDC), the World Health Organization and the U.S. Department of Health and Human Services,

are "greatly concerned that a new influenza type A outbreak will result in a rapid spread of infectious disease, overwhelming existing medical response infrastructures." Each of those organizations has published planning guides that call upon local and community organizers to begin preparing for such an event. To establish insight and provide context for the organizers, Glantz's paper presents a case analysis of the Philadelphia [yellow fever](#) outbreak of 1793.

In 1793, Glantz wrote, Philadelphia was at its peak, serving as the capital of both Pennsylvania and the recently formed U.S. government. With 50,000 residents, it was the largest metropolitan area in the U.S., and its port handled one-fourth of the nation's shipping. The city's good fortune ended in July 1793, when a cargo ship brought the female *Aedes aegypti* mosquito, along with individuals currently infected with yellow fever. Confusion and panic quickly set in, as there was no medical direction on what would halt the escalating death rates, and most city, state and federal officials and employees had already fled their posts. About 40 percent of residents, including most of the city's wealthy, evacuated—even George Washington retired to Mount Vernon earlier than expected. The city's government ceased to operate, resulting in crime, abandonment and people being left out in the streets to die.

The death rate did not begin to decline until November, Glantz wrote in the paper, when the temperature dropped and the frosts began. While the crisis may have subsided, the epidemic—along with the way it was handled—had severely damaged Philadelphia's standing in public opinion.

"The crisis served as a basis for attack in subsequent recriminations and politicking," he wrote. "In addition, Philadelphia had lost its most favored city allure, along with any hope of remaining as capital of the United States."

According to Glantz, there are many useful insights to assist modern crisis management from an analysis of Philadelphia's 1793 epidemic. An epidemic occurs when new cases of a certain disease, in a given human population, and during a given period, substantially exceed what is expected based on recent experience. A pandemic, on the other hand, is an outbreak of global proportions. It happens when a novel virus emerges among humans and causes serious illness, spreading easily from person-to-person.

"We know we're going to have two or three major pandemics each century," Glantz said.

The College of IST is taking a proactive approach in training future leaders in emergency management, he said, by teaching skills that have wide applicability. The SRA major at the College of IST looks at how to design systems that are secure, how to measure risk and how to ensure that proper levels of privacy are maintained for individual technology users, businesses, government and other organizations. The concepts that are taught in the SRA classes, Glantz said, can also be applied to epidemiology. In his paper, he wrote that epidemics "merit further consideration for crisis management, similar to the response and decision making of other natural disasters, such as hurricanes and earthquakes."

"The paper talks about non-traditional crises, such as [infectious diseases](#), that include all of the horror of a natural disaster with some exacerbating differences," Glantz said.

The circumstances that typically surround an epidemic/pandemic, he said, include fear, confusion, decimation of caregivers and lack of support from neighboring communities. The SRA curriculum can be tailored to counteract infectious disease outbreaks in a number of ways, Glantz said. Through intelligence analysis, people could identify up-and-

coming diseases as well as determine the appropriate community response and treatment. SRA students who are studying risk management learn to identify risks and develop controls to limit those risks, which could be useful when dealing with contagious outbreaks. The CDC has a rigorous two-year training program for public health officials, Glantz said. In the introductory SRA class that he teaches, he introduces an intelligence analysis model that is based on a Legionnaires' disease outbreak. The skills he teaches in the class, he said, are based on the CDC training model.

The Philadelphia yellow fever epidemic, Glantz said, along with other infectious disease outbreaks throughout history, reveal the need for better community planning to handle the spike in people seeking medical treatment during an outbreak, and the need for individuals who are willing to attend to the needs of the elderly, the poor and children. There is also an urgent need for families to have information that would direct them on what steps to take in the event of a pandemic. In addition, he wrote in the paper, there is a need to "balance communications between informing and enflaming the public."

"You can greatly minimize the outcome (of a pandemic) if you apply intelligent thought to it," Glantz said.

Provided by Pennsylvania State University

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