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Exclusively for Management

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Public-health weaknesses imperil U.S. food supply

System-wide reform needed to protect public health against 21st century threats

Across the United States, extending several stories underground, thousands of missile silos stand ready to protect the nation against a nuclear assault. The threat of nuclear attack has dwindled significantly since the collapse of the Soviet Union, yet these hidden defenses continue to provide a measure of safety and security to millions of Americans, who trust their government to protect them.

In many of the same regions, rising proudly against the sky, thousands of grain silos store the fruits of one of the world's most efficient food producers. Here, however, the government has invested relatively little in safeguarding the U.S. food supply. Americans enjoy an unprecedented level of food security—as opposed to scarcity—trusting their leaders to protect this fundamental need: People in this country cannot conceive of a situation that would deny them easy, inexpensive access to nourishment. Even so, food supplies in U.S. cities can only sustain their respective populations for seven days—a disturbing statistic addressed during last month's issue.

Few Americans realize how illusory their food security is. Fewer realize how little is being done to safeguard the food supply against either a deliberate attack or a natural outbreak.

The terrorist assaults of September 11, 2001, generated a surge of public-health funding to bolster preparedness against bioterrorist acts. The specter of bioterrorism constitutes an important threat, but not the only danger confronting the American food supply. Increased globalization further jeopardizes food safety, as do natural disasters.

This issue of The Lipman Report *is the second to examine vulnerabilities in the U.S. food supply, with special emphasis on the evolution of modern public-health systems and current state initiatives.*

Foodborne disease: A global problem

According to the World Health Organization, foodborne disease strikes up to approximately 30 percent of the population in industrialized countries each year. The international agency reports that an estimated 1.5 million people die annually from diarrheal diseases linked to contaminated food or drinking water. In the United States, which boasts the world's safest food supply, the Centers for Disease Control and Prevention (CDC) in Atlanta estimates that foodborne illnesses sicken 76 million each year. Many of these individuals experience nothing more severe than mild, temporary discomfort, but more than 300,000 require hospitalization and 5,000 die.

Often, foodborne illness results from improper food handling or preparation in the home, but there have been numerous instances of widespread contaminations affecting several thousands. The largest incident of foodborne disease occurred in 1991, when nearly 300,000 people in Shanghai, China, contracted hepatitis A from eating tainted clams. These outbreaks are not restricted to other nations, however. In 1994, 224,000 people in 41 states came down with *Salmonella enteritidis infection* after consuming contaminated ice cream, and a Northeastern firm voluntarily recalled 27.4 million pounds of fresh and frozen ready-to-eat chicken and turkey products in October 2002 because of the possible presence of *Listeria monocytogenes*.

The ongoing war on terror has raised awareness of food safety as leaders contemplate the consequences of deliberate sabotage anywhere in the "farm to fork" chain. Attacking the food supply would achieve two primary goals of terrorists: public panic and, depending on the nature of the act, economic damage.

Apart from the rising danger of food terrorism, natural disasters can and do threaten the global food supply. The tsunamis that left more than 300,000 dead or missing in Southeast Asia offer a dramatic example. While the disaster did not wipe out food stores in the region, scientists fear that contaminated water will produce epidemics of diseases such as malaria, typhoid fever and cholera. Management of the tidal waves' aftermath could hold valuable lessons for the rest of the world in responding to future public-health crises; it could also underscore one of the great challenges facing modern public-health systems—increased globalization. A problem on one side of the world can have dire consequences several continents away.

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In 1996, for instance, more than 1,400 people in North America became ill from the parasite *Cyclospora cayetanensis* after eating Guatemalan raspberries irrigated with polluted water.

Federal vs. state authority

The United States and member nations of the European Union (EU) approach public health from opposite sides, with each system bringing its own advantages and disadvantages.

EU countries typically view health and the provision of health services as a national responsibility, a tradition rooted in feudal society.

In Europe, during the Middle Ages, poison offered a simple, effective way to dispose of one's enemies. Deadly substances like arsenic, henbane and hemlock were readily available, and wine or spicy foods masked their taste. To guard against such attacks, royalty used servants as tasters to ensure the purity of their food. Conversely, European royals issued edicts to their subjects to warn them against foods or unsanitary conditions that could lead to illness.

From this heritage, the modern European health system evolved into a top-down effort to protect the public, supported by an extensive infrastructure. National databases capture patients' medical records, including immunizations received and antibiotics taken. These systems not only permit physicians to provide patients with informed healthcare, but they also contribute to an effective disease-surveillance network, allowing public-health providers to track unusual outbreaks.

In the United States, however, most public-health regulatory authority rests with the individual states—a system that evolved from the westward expansion of the nation's founding. Each community had to manage its own public-health emergencies on a local level. The country never developed a national infrastructure. Consequently, the fate of public health continues to rest in the hands of a patchwork quilt of local statutes and regulations. "For communities that are dedicated to the public health of their populations, there is a lot of flexibility to create the sort of system you want and to shift resources around relatively rapidly," said Laurie Garrett, Pulitzer Prize-winning journalist and Senior Fellow for Global Health at the Council on Foreign Relations.

U.S. public health in action.

Different states, naturally, have different public-health priorities.

In many parts of the country, emergency preparedness represents a concern, but limited funds and staffing often keep states in a reactive mode. Overstretched resources preclude extensive planning and preparation for worst-case scenarios.

Other states—like New York—live with the daily knowledge that disaster can strike at any time.

According to Dan Sowards, Food and Drug Safety Officer for the Director of Regulatory Services in Texas, the September 11 attacks immediately spurred state authorities to assess and update the existing emergency management plan. They broadened the portion that governed product tampering to address intentional contamination of the food supply.

State authorities did not test the revised plan through tabletop exercises, although many officials have participated in other simulations, such as "Crimson Winter." Conducted in January 2003, that exercise depicted an intentional attack on the food supply, offering food-safety officials an opportunity to experience the responsibilities they would face in that type of crisis. Sowards and other participants returned from the simulation with many unanswered questions that they needed to address, revealing holes in existing preparedness strategies.

Food-safety officials in Florida likewise recognize the value of crisis drills and make them a state priority. Given the frequency with which hurricanes

batter the state, public-health emergencies constitute a fact of life—not a theoretical event. "We've had tabletop exercises in various parts of the state on biosecurity, and food is one portion of that exercise," said Dr. Wayne Derstine, Environmental Administrator, Division of Food Safety, Florida Department of agriculture and Consumer Services. The exercises unite law enforcement, other emergency responders and food-safety officials.

When four hurricanes struck Florida between August and October 2004, public-health teams traveled to the devastated areas to inspect food-production facilities, evaluating the damage and ensuring adherence to proper sanitation practices. Lack of potable water presents a primary challenge. "You wouldn't believe the amount of water required in manufacturing and processing food," said Dr. Derstine. "If we find [a plant] in poor shape, we stop use of the equipment. We stop sale of the product." Inspectors return every few days to re-evaluate facilities and return them to normal operations. At the time of this publication, some food processors damaged by the recent wave of hurricanes have still not reopened.

Rating the states

Overall, how are the individual states faring in their charge to protect public health?

Last December, a nonprofit public-health advocacy group released its second annual assessment of state preparedness. The Washington, D.C.-based organization tracked the almost $1 billion in federal funds awarded annually to states for public-health emergencies since 2002 and analyzed its impact on bioterrorism preparedness, many aspects of which reflect ability to respond to other health crises such as naturally occurring epidemics. While the infusion of federal money has yielded improvements, the report's authors describe the results as "incremental progress," compared to the "substantial modernization" required by the situation.

Like the 2003 report, the 2004 study analyzed 10 quantifiable public-heath preparedness indicators, but the indicators measured from year to year differed, reflecting the expectation of greater preparedness one year later. No states attained all 10 benchmarks. Only two states achieved nine out of the 10: Florida and North Carolina. Two states, Alaska and Massachusetts, received only three points, representing the lowest score. More than two-thirds of the states and Washington, D.C., achieved six indicators or fewer.

The study found that budget deficits continue to undermine federal funding efforts. Nearly one-third of states reduced public-health budgets in FY 2004. Federal bioterrorism funding decreased by more than $1 million per state in 2004, even though states still lack the resources to correct preparedness gaps. As one example, only six states have achieved recognition as being adequately prepared to administer and distribute the 50-ton "push packages" of vaccines and antidotes that form part of the Strategic National Stockpile—Florida, Illinois, Louisiana and three undisclosed states.

Other key findings of the 2004 report include the following:

- Only one-third of states follow national standards for electronically tracking disease outbreak information: Alabama, Colorado, Florida, Georgia, Illinois, Kansas, Louisiana, Michigan, Missouri, Nebraska, New Jersey, New York, North Dakota, Ohio, Pennsylvania, South Carolina, Tennessee and Texas. These states can enter reported cases directly into the National Electronic Disease Surveillance System (NEDSS), making the information available to other connected health departments almost immediately. Unfortunately, states using other data-entry systems and traditional mail-in forms contribute to delays in reporting diseases, which makes rapid warning and response difficult, if not impossible.
- The public-health workforce faces a dangerous "brain drain" as the baby-boomer generation approaches retirement and inability to

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compete with the private sector hinders next-generation recruitment efforts.

In short, the study's authors concluded that the nation has successfully taken several baby steps toward bioterrorism preparedness, but the United States remains woefully vulnerable to attack.

Next steps

The study cited above represents only one of many that have identified deep-seated weaknesses in the U.S. public-health system—weaknesses that will sorely test the ability to respond to either a biological terrorist attack, such as food-supply contamination, or a naturally occurring outbreak.

To begin, the U.S. government needs to perform a comprehensive review of the Public Health Security and Bioterrorism Preparedness Response Act of 2002, also known as the Bioterrorism Act, which requires reauthorization in 2006. Congress must analyze the flow of current funding and determine how to maximize those dollars. This effort needs to include instituting quantifiable standards of accountability, requiring states to demonstrate how they have made tangible improvements based on federal standards. Additionally, states need to show a "maintenance of effort," ensuring that they are continuing to support public-health initiatives with state funding—not using federal money to replace state investment. Tying federal funds to performance and accountability will provide greater incentive for states to boost preparedness.

The only way to ensure the effectiveness of preparedness efforts—besides execution in an actual emergency—is to conduct more drills to analyze capabilities and vulnerabilities. Just as organizations in the private sector must rehearse their emergency response plans, so must state and local authorities practice their preparedness plans. Detailed simulations with specific performance standards can help the various agencies involved in emergency response coordinate their efforts: a critical task given often-contradictory cultures. The goals of law enforcement, for instance, may counter those of public-health officials, even though both groups are ultimately working for the public protection; they have been trained to achieve their missions in different ways. Coordinated drills bring such conflicts to light and can assist with remediation.

Reinforcing the public-health workforce should rate as another top priority. Coinciding with the graying of the baby boomers, the United States faces lower birth and immigration rates; fewer people are available to take their places. Public health must cope with the additional challenge of non-competitive salaries. In the absence of recruitment and retention incentives, young professionals are turning toward more lucrative opportunities in the private sector. Unless the public-health sector invests more resources in personnel, it will face the increased demands of the post-September 11world with significantly less human capital.

A safe food supply and a secure public-health system represent two fundamental needs that the American people expect their leaders to provide. The reality, however, is that both items fall relatively low on the national scale of priorities. On the surface, food and public health appear robust, appropriate to the world's wealthiest nation, but closer examination reveals systemic vulnerabilities that could devastate the United States in the event of a terrorist attack or a natural pandemic.

Both the threats and the weaknesses have been identified, but the question remains: Will the nation act before it is too late?

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