



TRUST FOR AMERICA'S HEALTH IS A NON-PROFIT, NON-PARTISAN ORGANIZATION DEDICATED TO SAVING LIVES BY PROTECTING THE HEALTH OF EVERY COMMUNITY AND WORKING TO MAKE DISEASE PREVENTION A NATIONAL PRIORITY.

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SARS AND ITS IMPLICATIONS FOR U.S. PUBLIC HEALTH POLICY – “We’ve Been Lucky.”

Severe acute respiratory syndrome (SARS) is a new and serious public health threat. Much like the anthrax attacks of 2001 or the current national asthma epidemic, the recent SARS outbreak provides a “real time” example of the complex challenges facing the U.S. public health system – the network of local, state and federal health agencies that collectively are responsible for disease prevention, response and control in America.

What is SARS?

SARS is a life-threatening respiratory illness that has been reported in Asia, North America, Europe, South America and Africa and has already infected thousands of people worldwide and has caused hundreds of deaths. In fact, on May 7, 2003, the World Health Organization (WHO) concluded that approximately 15% of those infected with SARS will die.¹

SARS is puzzling government officials and scientists around the globe, constraining travel, producing economic chaos, and creating widespread fear. The health community still has many unanswered questions about the progression and recovery of the virus.² Presently, there is no known effective treatment.

SARS symptoms generally begin with a fever greater than 100.4F (>38.0° C) and may include headache, body aches and a

generalized feeling of discomfort. Some people also experience mild respiratory symptoms. After two to seven days, SARS patients may develop a dry, nonproductive cough and worsened respiratory symptoms that may progress to the point where insufficient oxygen is getting to the blood. In 10% to 20% of cases, patients will require mechanical ventilation. The most severe cases end in death.³

Transmission of the disease appears to involve close human-to-human contact, predominantly through aerosol droplets (e.g. coughing or sneezing). Although not yet confirmed by scientists, it is possible that SARS may be spread more broadly through the air or by contact with infected surfaces. At this point, no one can predict how far the disease will spread and how much higher the human toll will be. Health professionals are unsure if this outbreak will be contained or is likely to become the next global pandemic.

The Public Health Response

THE LOW NUMBER OF SARS CASES IN THE U.S. SEEMS TO BE “THE GOOD LUCK THAT WE HAVE NOT HAD THE RIGHT COMBINATION OF SOMEONE WHO IS HIGHLY INFECTIOUS AND INADEQUATELY PROTECTED PUBLIC HEALTH PERSONNEL.”⁴

– CDC Director
Julie Gerberding as
reported in
The New York Times

U.S. and international public health officials are working urgently and collaboratively to address the SARS outbreak. Consulting with the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) has been the lead government agency responsible for coordinating the U.S. response.

To date, the response of the CDC to the global SARS epidemic is testament to why a coordinated public health game plan can and will save lives. At the same time, however, it is important to note that SARS has barely touched U.S. shores, so the preparedness of the entire public health system – local and state health departments, hospitals, and laboratories – remains largely untested.

Yet, the SARS outbreak also has demonstrated just how easily health care systems can be overwhelmed by the demands for patient screening and care, particularly with the specialized infection control requirements that come with an infectious respiratory illness. Similarly, the disease has resulted in troubling questions about how and when travel and commerce should be constrained in the context of communicable disease. On both the domestic and international level, a great deal more work must be undertaken to develop appropriate policies, define authorities and design strategies for containing a global epidemic.

While scientists are rapidly working to develop vaccines, pharmaceutical treatments, and other medical interventions, our best hope today is a vigilant public health system that rapidly detects, responds and isolates SARS cases, thereby stopping the epidemic dead in its tracks.

In the past, the U.S. public health system served as the world leader in stamping out diseases like yellow fever, typhoid, influenza, and cholera. It is again time for the U.S. to be at the forefront of fighting the newest global epidemic. But, are our national public health defenses up to the task?

Sadly, the answer is “no.”

The Public Health System is Sick Itself

The 2001 CDC report on public health infrastructure found that the current U.S. public health infrastructure “is still structurally weak in nearly every area.” The report calls for a system of “public health armaments,” including a “skilled professional workforce, robust information and data systems and strong health departments and laboratories.”⁶

“OVER THE PAST TWO DECADES, THE [NATION’S PUBLIC HEALTH] INFRASTRUCTURE HAS GREATLY DETERIORATED. A LACK OF FOCUS, FUNDING, AND NATIONAL ATTENTION HAVE COMBINED TO REDUCE THE PHYSICAL STRUCTURES (SUCH AS LABORATORIES) AND WORK-FORCE CAPABILITIES NECESSARY TO COLLECT AND ANALYZE DATA, CONDUCT EPIDEMIOLOGY AND DISEASE SURVEILLANCE, COMMUNICATE EFFECTIVELY, AND IMPLEMENT INTERVENTIONS TO RESPOND TO THREATS TO THE HEALTH OF THE ENTIRE COMMUNITY.”⁵

— U.S. Senate Majority Leader, Bill Frist, MD

In a separate report, the General Accounting Office (GAO) found that “the 1999 West Nile Virus outbreak, which was relatively small, taxed the federal, state and local laboratory resources to the point that officials told us that the CDC would not have been able to respond to another outbreak had one occurred at the same time.” According to the GAO report, coordination between state, local and federal authorities, communication systems, disease tracking, staffing and laboratory capacity are areas that require immediate improvement.

SARS highlights the gaping holes in systems designed to prevent disease, and to respond and control outbreaks when they do occur. Despite the recent targeted federal support for bioterrorism preparedness, America’s public health infrastructure remains fragile, due to years of “perceived irrelevance,

underfunding and Congressional mistrust,” which in turn has led to limited federal funding, says CDC Director Gerberding.⁷ In testimony before the House of Representatives on the SARS outbreak, GAO’s Director of Health Care — Public Health Policy, Janet Heinrich, summarized that, “...there are significant gaps in public health surveillance systems and laboratory capacity, and the number of personnel trained for disease detection is insufficient.”⁸

SARS reminds us too that public health officials must always be ready today for the unexpected health threat of tomorrow. While it will never be possible to fully anticipate and prepare for every potential threat — occurring in nature or perpetrated by terrorists — there is a great deal that can and should be done.

Revitalizing Public Health Can Not Be Achieved on a Piecemeal Basis

The prevention, containment and treatment of SARS cannot be considered in isolation. Today, the U.S. public faces a broad spectrum of potential, emerging and existing health threats, including:

- **Infectious diseases:** SARS is but one of a series of new and deadly infectious diseases, including West Nile Virus — not to mention longstanding diseases like tuberculosis that have resurged, often in new and more virulent forms due to drug-resistance;
- **Chronic diseases:** The rates of these diseases that include cancer and diabetes and are responsible for 70% of American deaths, continue to rise; and
- **Biological, chemical, and radiological terrorism:** In the post-September 11, 2001 era, we must be prepared for the potential use of biological, chemical, and radiological agents as weapons used by terrorists intent on causing mass casualties.

The public health response to SARS cannot be viewed as a one shot deal. Preventing epidemics and protecting people means making strategic investments in revitalizing and modernizing America's entire public health system.

The good news is that the public health community knows what works — improving early warning systems, enhancing communications plans, creating nationwide disease tracking networks, assuring quality laboratories, and recruiting a new generation of public health professionals. Now, we have to generate the national resolve to do it right.

HOW THE PIECES OF AN EFFECTIVE PUBLIC HEALTH RESPONSE FIT TOGETHER

In order to be adequately prepared for a major infectious disease outbreak like SARS, the GAO finds that:

- *Public health departments need to have disease tracking systems and epidemiologists to detect clusters of suspicious symptoms or diseases in order to facilitate early detection of disease and treatment of victims.*
- *Laboratories need to have adequate capacity and necessary staff to test clinical and environmental samples in order to identify an agent promptly so that proper treatment can be started and infectious diseases prevented from spreading.*
- *All organizations involved in the response must be able to communicate easily with one another as events unfold and critical information is acquired.*
- *In addition, plans that describe how state and local officials would manage and coordinate an emergency response need to be in place and to have been tested in exercises at the state, local, and regional levels.⁹*

Components of a “Well-Prepared” Public Health System

The Institute of Medicine (IOM) released a major report in November 2002 on the future of the public’s health in the 21st century. As part of its recommendations for repairing “a neglected [public health] system,” the IOM called for an “overhaul of its components” which include legal authorities, workforce, communications and information technology, disease surveillance, and public health laboratories, among other elements.¹⁰

The following is a brief analysis of the key public health infrastructure components in the context of the SARS epidemic and TFAH’s recommendations for strengthening them.

HEALTH TRACKING

A strong public health defense begins with disease surveillance, also known as health tracking. It not only helps us monitor and mitigate potential chemical and bioterrorist attacks, but also is crucial to unlocking the mysteries behind chronic and infectious diseases. Tracking disease is one of the most vital weapons public health officials have in the fight to prevent and control threats to the nation’s health.

A comprehensive disease tracking system monitors the occurrence of disease and can inform the rapid identification of outbreaks or “clusters” of cases, which leads to analysis of geographic variations and temporal trends. With this information in hand, public health investigators can search for the sources and routes of exposure to determine why the outbreak occurred, how to prevent similar outbreaks in the future, and, if the outbreak is ongoing, how to prevent others from being exposed. Concurrently, action must be taken to control the spread of the disease and minimize further illness and death, even when clear cause and effect have not been fully identified.

DISEASE TRACKING DOUBLE DUTY

The good news is that the system for tracking an infectious disease like SARS could also be used to track chronic diseases conditions if designed properly. For example, SARS and asthma are both respiratory conditions. Today, between 14-15 million Americans have asthma, including 5 million children.¹¹ Asthma rates in the U.S. climbed over 58% from 1979 to 1992, and the death rate from asthma for children under the age of 19 escalated 78% from 1980 to 1993. It is the leading cause of school absences from a chronic disease for children ages 5 to 17 and is estimated to cost the country over \$11.3 billion annually.¹² Advances that help us track and contain SARS can be used to do “double duty” to help us understand and prevent asthma. This will require a strategic plan for health tracking, not the piecemeal, “disease de jour” approach that presently exists.

TFAH IS CALLING ON CONGRESS TO ALLOCATE \$100 MILLION IN FY 2004 AS THE NEXT STEP FORWARD IN CREATING A ROBUST, INTEGRATED NATIONWIDE HEALTH TRACKING NETWORK.

ALSO, CONGRESS SHOULD SUBSTANTIALLY INCREASE FUNDING TO ENHANCE THE INFORMATION AND COMMUNICATIONS SYSTEMS RELATED TO PUBLIC HEALTH SURVEILLANCE.

For the first time, in FY 2002 and again in FY 2003, with bi-partisan support, Congress allocated initial funds to begin a program to establish a nationwide disease tracking network at CDC.¹³ The Administration's FY 2004 budget request also recognizes the importance of health tracking, calling it a "major focus" of its environmental health program. It is now time to take this critical surveillance tool to scale. TFAH is calling on Congress to allocate \$100 million in FY 2004 as the next step forward in creating a robust, integrated nationwide health tracking network.

Also, Congress should substantially increase funding to enhance the information and communications systems related to public health surveillance. Specifically, Congress should provide full funding for the National Electronic Disease Surveillance System (NEDSS), which serves as CDC's architectural backbone of surveillance. Former CDC Director, Dr. Jeffery P. Koplan wrote in

2002, "As the initiative [NEDSS] proceeds, it will reshape the way public health is practiced with unprecedented access to high-quality and timely surveillance data."¹⁴

Finally, SARS illustrates the need for global public health tracking. Failures to initially track this unusual respiratory syndrome last fall in China's Guangdong Province likely represents a missed opportunity for rapid investigation of the outbreak and disease control. Time lags in getting samples to the best laboratories around the world for evaluation no doubt added further significant delays to an already difficult diagnostic challenge. To make matters worse, the U.S. is not alone in lacking a comprehensive, coordinated nationwide health tracking network; there is not an adequate system for global disease surveillance either. Nor is there a coordinated system worldwide to assure appropriate action and response when cases appear.

LEGAL AUTHORITY

CDC does not have a command and control mentality with respect to disease surveillance. The most recent example is the agency's unwillingness to require that SARS be considered a reportable disease in every state. In fact, most of the nation's disease tracking systems suffer from the lack of national standards and uniform structures, resulting in a patchwork approach to disease tracking. Often, the CDC is in the unenviable position of having to cajole state health departments to provide important data about cancer, birth defects, and many other chronic diseases and conditions.

In many other cases, CDC and the states lack the legal authority to respond to emerging health threats, although since September 11, 2001, 35 states and the District of Columbia have considered legislation to clarify the health powers of state and local public health authorities to ensure

a strong, effective, and timely responses to public health emergencies, while also respecting individual rights.¹⁵

Isolation and quarantine are two common public health strategies which aim to protect the public by preventing exposure to infected or potentially infected individuals.

Generally, isolation refers to the separation of people who have a specific infectious illness from healthy people and the restriction of their movement to stop the spread of that illness. Isolation is a standard procedure used in hospitals today for patients with tuberculosis and certain other infectious diseases.

In contrast, quarantine usually refers to the separation and restriction of movement of people who are not yet ill, but who have been exposed to an infectious agent and are

therefore potentially infectious. Quarantine of exposed individuals is a public health strategy, like isolation, that is intended to stop the spread of infectious disease. Both isolation and quarantine may be conducted on a voluntary basis or compelled on a mandatory basis through legal authority.

On April 4, 2003 the President signed an executive order adding SARS to the list of quarantinable communicable diseases under the Public Health Service Act. By amending the list to include SARS, the U.S. government took the pragmatic step of readying all options as the public community continues to tackle this disease. This authority would only be used if someone posed a threat to public health and refused

to cooperate with a voluntary request.¹⁶ Canada, Singapore and Hong Kong have taken similar measures.

SARS patients in the United States are being isolated until they are no longer infectious. Patients with the most severe cases are being cared for in hospitals. Those with milder cases are being cared for at home. Individuals being cared for at home have been asked to avoid contact with other people and to remain at home until 10 days after the resolution of fever, provided that respiratory symptoms are absent or improving. To date, the CDC has recommended isolation of individuals with SARS, but has not compelled quarantine or isolation of these individuals.¹⁷

REPAIRING STATE PUBLIC HEALTH LABORATORIES

The public relies on state public health laboratories to deliver reliable and rapid results to communities and individuals. The Association of Public Health Laboratories (APHL) identifies the core functions of labs as: monitoring food and water safety, emergency response, specialized testing, disease prevention and control, and training and education. Unfortunately, state budget cuts and stagnant federal funding have left these state public laboratories in disrepair.

Even before the SARS outbreak, the nation's public health laboratories were stretched to their limits working on biological and chemical terrorism preparedness, other emerging infectious diseases like West Nile Virus and environmental health issues, in addition to the everyday demands of routine public

health testing and new federal regulatory requirements.

The APHL reports a myriad of problems confronting public health laboratories, including outdated facilities, equipment, and communications systems in addition to inadequate training and staffing.¹⁸

The APHL recently asked Congress for an immediate infusion of \$10 million to help state public health laboratories deal with SARS, including funds for the following needs:

- **Instrumentation;**
- **Personnel;**
- **Laboratory testing for respiratory illnesses; and**
- **Packing and shipping of specimens.**

APHL also recommends that the CDC be provided with additional resources to assist with its SARS-related activities including the production of reagents for SARS testing. These funding requests should be considered immediately to ensure public health capacity if a broader SARS outbreak hits the U.S.

The Need for Qualified Public Health Professionals

Public health professionals have traditionally been guardians of the health of communities. They are charged with preventing health epidemics. These professionals perform the detective work necessary to provide proper treatment and prevent the spread of problems in emergency events, such as a chemical spill or food-borne illness outbreak, and are responsible for finding ways to manage ongoing health threats through measures like mammography screenings, childhood immunizations, and tobacco cessation programs.

According to the Health Resources and Services Administration (HRSA), fewer than 50% of the current 500,000 public health professionals have had formal, academic training in public health. Recent CDC data shows that 78% of all local health department executives do not have graduate degrees in public health. Further, their average tenure is less than two years, which dilutes their ability to handle a public health crisis with authority.

The results are painfully clear: without trained and capable staff, our communities are vulnerable to unforeseen health threats and hamstrung in efforts to prevent illness. Public health officials, working together with private

clinicians, can be the face of a healthier America. A January 2003 GAO report stated that “increasing staffing of public health departments and laboratories is a top priority for enhancing preparedness in many areas.”¹⁹

The CDC has recommended that one trained epidemiologist be available for every 500,000 people; this investment in the public health workforce will provide communities with the scientific knowledge necessary to create a healthier U.S. population. Public health laboratories are also facing insufficient training opportunities and staffing, which is negatively affecting the capabilities, particularly to respond to surge in service demands that occur in times of crises.²⁰ State laboratories need adequate levels of PhD-level microbiologist and PhD-level chemists to ensure effective biological, chemical, and environmental testing capabilities.

CDC’s Epidemic Services and Response Program trains public health professionals to respond to emergencies, develop accurate public health information, and provide resources for surveillance systems. The President’s FY 2004 budget cuts this critical effort by 2.3%, or \$1.8 million, compared to current year funding levels. These funds must be restored.

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Upgrading Communications Capability

Chronic under-funding has led to a network of agencies that have trouble communicating with each other, let alone with the public. CDC data illustrates that public health departments lack basic infrastructure necessary to keep the public informed and as we have learned with SARS, communicating with a shaken public is key to alleviating natural fears that arise with an emerging illness.

The Health Alert Network (HAN), a federally coordinated system between the CDC and state/local health departments, has the

potential to fill this current communications gap. By using advanced technological tools, this network will allow for real-time coordination in situations where even seconds matter. Currently, all 50 states in addition to the District of Columbia and Guam receive funding and technical assistance.

The HAN plays a vital role in the nation’s state of readiness and timetables to completion and activation must be accelerated and linked directly to state and major metropolitan health departments.

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WHY ARE NEW EPIDEMICS EMERGING OR REEMERGING?

Infectious illnesses unknown in the United States only a few years ago, like West Nile encephalitis and hantavirus pulmonary syndrome, have emerged to kill hundreds of Americans. Meanwhile, infectious diseases such as measles, tuberculosis, and malaria—which were thought to be a thing of the past in the United States—have reappeared.

Several decades ago, there was enormous optimism that the threat of infectious diseases was receding. Scientific and technologic advances, including the development of antibiotics and vaccines, along with improved sanitation and vector control enabled the control and prevention of many infectious diseases, particularly in the industrialized world. However, we know today that such optimism was premature. It did not take into account many critical factors like:

- *Extraordinary increases in international travel, immigration and trade;*
- *Movement of people into urban settings where opportunities for the spread of disease are amplified through crowding, and possibly poor sanitation and hygiene;*
- *Changing agricultural practices and environmental manipulations that alter disease vectors as well as opportunities for exposure;*
- *Continuing difficulties of translating existing medical knowledge and tools into action for all who need it, whether because of inadequate resources, ignorance or complacency; and*
- *The extraordinary resilience and adaptability of the microbes themselves.*

“Whether naturally occurring or intentionally inflicted, microbial agents [infectious diseases] can cause illness, disability, and death in individuals while disrupting entire populations, economies, and governments. In the highly interconnected and readily traversed ‘global village’ of our time, one nation’s problem soon becomes every nation’s problem as geographical and political boundaries offer trivial impediments to such threats.”²¹

*– 2003 Institute of Medicine report: *Microbial Threats to Health: Emergence, Detection, Response**

CONCLUSION:

Urgent Care and Leadership Needed Now

Until now, the federal government has neither addressed the current comprehensive public health crisis at a sufficiently high level, nor provided adequate resources.

The experience with SARS reinforces the need for improved disease surveillance and reporting, linked to a rapid investigation and response capability, including adequate and appropriate diagnostic laboratory capacity. The response to SARS underscores the importance of strong public health systems, from the global to the local, as well as integrated and well-functioning systems for health care delivery. Future preparedness will also depend on a well-educated and trained clinical and public health workforce. In addition, the nation needs a sound research agenda addressing near and long-term requirements for new insights into the nature of infectious disease threats, human host responses, and the opportunities to develop new diagnostics, drugs and vaccines.

As stated in the IOM's *Microbial Threats to Health: Emergence, Detection, and Response* report, "the prevention and control of infectious diseases are fundamental to individual, national, and global security; failure to recognize – and act on – this essential truth will surely lead to disaster."²² The magnitude and urgency of the problem demand renewed concern and commitment.

To this end, the Department of Health and Human Services should convene a national

summit on the future of the American public health system and the resources needed to build a robust, integrated 21st century infrastructure that can play a "double duty" role by enhancing preparedness for the full spectrum of health threats from chemical terrorism to cancer and from biological attacks to birth defects.

As the SARS epidemic illustrates, the United States needs to devise strategic solutions for revitalizing and bolstering our public health defenses, while avoiding the "piecemeal fixes" of the past. The goal of the summit should be to produce a blue print for the future, wherein the public health system is re-designed in light of this century's current and emerging health threats. At the same time, there should be a national dialog on the resources needed to implement the requisite changes and the need for accountability at every level of the public health system.

As we take stock of our prospects with respect to microbial threats in the years ahead, public health leaders and national policy makers must recognize the need for a new level of attention, dedication, and sustained resources to ensure the health and safety of this nation – and of the world.

About the Authors

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