

ISSUE REPORT

# Ready or Not?

PROTECTING THE PUBLIC'S HEALTH FROM  
DISEASES, DISASTERS,  
AND BIOTERRORISM

# 2006



DECEMBER 2006

PREVENTING EPIDEMICS.  
PROTECTING PEOPLE.

 Trust for  
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## ACKNOWLEDGEMENTS:

*This report is supported by grants from the Robert Wood Johnson Foundation (RWJF) and the Bauman Foundation. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the foundations.*

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*Vice President of Program, Planning  
and Evaluation*  
The California Endowment

**Theo Spencer**  
*Senior Project Manager*  
Natural Resources Defense Council

## REPORT AUTHORS

**Jeffrey Levi, PhD**  
*Executive Director*  
Trust for America's Health

**Laura M. Segal, MA**  
*Director of Public Affairs*  
Trust for America's Health

**Emily Gadola, MPP**  
*Public Affairs Research Associate*  
Trust for America's Health

**Chrissie Juliano, MPP**  
*Public Affairs Research Associate*  
Trust for America's Health

**Nicole M. Speulda, MA**  
*Public Affairs Associate*  
Trust for America's Health

## CONTRIBUTORS

**Jeremy Sharp**  
*Manager of Government Relations*  
Trust for America's Health

**Paul Smolarcik**  
*Consultant*

**Tim Stephens**  
*President*  
Rescobie Associates, Inc.

**Matt Crim**  
*Intern*  
Trust for America's Health

## PEER REVIEWERS

*TFAH thanks the reviewers for their time, expertise, and insights. The opinions expressed in this report do not necessarily represent the views of these individuals or their organizations.*

**Scott J. Becker, MS**  
*Executive Director*  
Association of Public Health  
Laboratories

**James S. Blumenstock**  
*Senior Principal Director*  
Public Health Protection and  
Preparedness Policy  
Association of State and Territorial  
Health Officials

**Jonathan Fielding, MD, MPH**  
*Director, Public Health Programs*  
Los Angeles County Department of  
Public Health

**Margaret A. Hamburg, MD**  
*Senior Scientist*  
NTI

**Robert P. Kadlec M.D.**  
*Director*  
PRTM; and  
*former Staff Director*  
U.S. Senate Subcommittee on  
Bioterrorism and Public Health  
Preparedness; and  
*former Director,*  
Health and Biodefense, Homeland  
Security Council, The White House

**Jennifer B. Nuzzo, SM**  
*Center for Biosecurity*  
University of Pittsburgh Medical Center

**Irwin Redlener, MD**  
*Associate Dean for Public Health  
Advocacy and Disaster Preparedness*  
Columbia University, Mailman School  
of Public Health

**Kathleen E. Toomey, MD, MPH**

# TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>1</b>
<b>SECTION A: State-By-State Health Preparedness Indicators and Scores</b> .....	<b>9</b>
Indicator 1: Strategic National Stockpile .....	13
Indicator 2: Laboratories - Biological Capabilities .....	16
Indicator 3: Laboratories - Workforce .....	19
Indicator 4: Laboratories - Seasonal Flu Testing .....	20
Indicator 5: Hospital Bed Surge Capacity and Pandemic Flu .....	21
Indicator 6: Seasonal Flu Vaccination Rates for Seniors .....	24
Indicator 7: Pneumonia Vaccination Rates for Seniors .....	27
Indicator 8: Disease Tracking .....	28
Indicator 9: Registered Nurses - Workforce Shortage .....	30
Indicator 10: State Public Health Budgets .....	33
<b>SECTION B: Strengthening Funding and Accountability</b> .....	<b>37</b>
1. Strengthening Preparedness Funds .....	37
2. Strengthening Accountability .....	38
<b>SECTION C: Additional Issues and Concerns</b> .....	<b>43</b>
1. Biomedical Advanced Research and Development Authority .....	43
2. Agroterrorism and Food-borne Illness .....	44
3. 5th Anniversary of the Anthrax Attacks .....	48
4. Private Sector and Community Involvement .....	50
5. Risk Communications and Public Opinion .....	52
6. Caring for Children During Disasters .....	53
7. Vulnerable Populations and Emergency Preparedness .....	55
8. World Trade Center Health Effects .....	56
9. Hurricane Katrina Analysis of Health Response Effort .....	57
<b>SECTION D: Recommendations</b> .....	<b>59</b>
<b>Appendix A: CDC and HRSA Preparedness Grants By State</b> .....	<b>65</b>
<b>Appendix B: Grant Guidance Summaries</b> .....	<b>67</b>
<b>Appendix C: Methodology for State Public Health Budgets</b> .....	<b>68</b>
<b>Appendix D: Methodology for Flu Vaccination Rates</b> .....	<b>69</b>
<b>Appendix E: Methodology for Nursing Shortage Study</b> .....	<b>71</b>
<b>Appendix F: Methodology for Hospital Beds and Pandemic Flu</b> .....	<b>72</b>



# Introduction: 5 YEARS AFTER 9/11

**2006** marks the fifth anniversary of the September 11, 2001 and anthrax tragedies. Since 2001, the nation has experienced many additional threats to the public's health, ranging from Hurricane Katrina to a life-threatening E. coli outbreak to rising concerns about a potential flu pandemic.<sup>1</sup>

America's public health system and the health-care delivery system are among the most important components of the nation's preparedness against terrorism and natural disasters. They are charged with the unique responsibility of protecting the health of all citizens. Public health and healthcare professionals act as first responders, investigators, strategists, medical care providers, and advisors to public officials and decision makers. They must diagnose and contain the spread of disease, and treat individuals who are injured or may have been exposed to infectious or harmful materials.

Intentional acts of terror and naturally occurring crises have the potential to cause serious harm to large portions of the American public. Decisions and actions taken by the public health system can greatly mitigate the negative impact of these threats and help protect the health and lives of the American people. Many health emergencies can also have serious global consequences, particularly infectious threats. Germs know no boundaries, so the U.S. must also remain vigilant and support the prevention and control of health threats around the world.

The U.S. "public health system" is not a single entity, but rather a loosely affiliated network of more than 3,000 federal, state, and local health agencies, often working closely with private sector voluntary and professional health associations.

## ASSESSING AMERICA'S READINESS

In order to evaluate public health emergency preparedness in the states, Trust for America's Health (TFAH) has issued an annual *Ready or Not?* report, beginning in 2003. Each report assesses the level of preparedness in the states, evaluates the federal government's role and performance, and offers recommendations for improving emergency preparedness. *Ready or Not? 2006* is the fourth in the series.

In 2002, Congress passed the Public Health Security and Bioterrorism Act, allocating nearly \$1 billion annually to states to bolster public health emergency preparedness. Even after this investment of almost \$4 billion, the government health agencies have yet to release state-by-state information to Americans or

policymakers about how prepared their communities are to respond to health threats.

### TFAH issues this report to:

- Inform the public and policymakers about where the nation's public health system is making progress and where vulnerabilities remain;
- Foster greater transparency for public health preparedness programs;
- Encourage greater accountability for the spending of preparedness funds; and
- Help the nation move toward a strategic, "all-hazards" system capable of responding effectively to health threats posed by diseases, disasters, and bioterrorism.

## READY OR NOT? 2006: MAJOR CONCLUSIONS

*Ready or Not? 2006* finds that five years after September 11, public health emergency preparedness is still not at an acceptable level. Limited progress continues to be made, but the big-picture goals of adequate preparedness remain unmet. As a result, Americans continue to face unnecessary and unacceptably high levels of risk.

Ready or Not 2006: Key Findings	
Indicator	Finding
1. Strategic National Stockpile	<b>Only 14 states and two cities</b> are rated at the highest preparedness level required to provide emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile (SNS).
2. Bio-Threat Testing	<b>Eleven states and D.C.</b> lack sufficient capabilities to test for biological threats.
3. Trained Lab Scientists	<b>Four states</b> lack sufficient laboratory experts trained to test for a suspected outbreak of anthrax or the plague.
4. Pandemic Surveillance: Year-Round Flu Testing	<b>Four states</b> do not test for flu on a year-round basis, which is necessary to monitor for a pandemic flu outbreak.
5. Hospital Bed Surge Capacity for Pandemic Flu	<b>Half of states</b> would run out of hospital beds within <u>two weeks</u> of a moderately severe pandemic flu outbreak.
6. Seasonal Flu Vaccinations	Flu vaccination rates for seniors decreased in <b>13 states</b> .
7. Pneumonia Vaccinations	The national median for vaccinating seniors for pneumonia is <u>65.7 percent</u> , the national goal is to vaccinate 90 percent by 2010.
8. National Electronic Disease Surveillance	<b>Twelve states and D.C.</b> are not fully compatible with the Center for Disease Control and Prevention's (CDC's) National Electronic Disease Surveillance System (NEDSS) to track disease outbreak information.
9. Nursing Shortage	<b>Forty states and D.C.</b> have a shortage of registered nurses.
10. Public Health Budgets	<b>Six states</b> cut their public health budgets between FY 2004-05 and FY 2005-06. As of FY 2005-06, the median state funding for public health is only \$31 per person per year.

## CONTENTS

- **Section A** examines **state-by-state public health preparedness**. States are evaluated on 10 preparedness indicators, based on input and review from public health experts.
- **Section B** examines the growing concerns about public health preparedness **funding** and **accountability** for the use of these funds, and the public's ability to measure progress and vulnerabilities.
- **Section C** examines a range of additional subjects related to federal, state, and local preparedness including: creation of a

Biomedical Advanced Research and Development Authority (BARDA); food safety; a review of the fifth anniversary of the anthrax attacks; private sector and community involvement in public health; risk communications; caring for children during public health emergencies; vulnerable populations and emergency preparedness; World Trade Center health effects; and Hurricane Katrina.

- **Section D** offers **recommendations** for improving all-hazards emergency health preparedness.

## Five Years After 9/11: Summary of Key Preparedness Improvements and Concerns

<p><b>Important Federal Legislation and Funding; Cuts to Funds Jeopardize Progress</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ The Public Health Security and Bioterrorism Act of 2002 was passed, providing nearly \$1 billion a year in increased funds for federal and state preparedness for mass health hazards.</li> <li>▲ Approximately \$5 billion was appropriated for pandemic flu preparedness in FY 2006.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ The new preparedness funds have already experienced cuts over the past 3 years, before many basic improvements could be achieved, and threatening the sustainability of progress that has been made.</li> </ul>
<p><b>Limited Accountability; “Silos” Remain</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ Federal agencies continue to progress in the development of preparedness measures.</li> <li>▲ The federal pandemic preparedness guidance focused on many specific, achievable tasks.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ CDC and HRSA “performance measures” for states’ use of preparedness funds are widely criticized for, among other things, focusing too heavily on self-reported, non-objectively verifiable data and on planning and process versus implementation and outcomes. The measures are also criticized for not adequately measuring the capabilities that are needed during surge events requiring mass response.</li> <li>▲ The federal agencies have yet to disclose any information on a state-by-state basis based on these performance measures.</li> <li>▲ One year after the announcement of the national pandemic preparedness plans, publicly available information needed to assess federal progress and actions remains limited.</li> <li>▲ There is insufficient coordination between public health and healthcare providers and among levels of government, often exacerbated by silo-ed government program funding streams.</li> <li>▲ Food safety policies and procedures are poorly coordinated.</li> </ul>
<p><b>Progress for “Plans on Paper”</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ All states have a basic plan on paper to respond to bioterrorism.</li> <li>▲ All states have at least a draft pandemic flu response plan; in 2003, only 13 states had pandemic plans.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ Planning for chemical and radiological threats is lagging.</li> </ul>
<p><b>Gaps in “Plans on Paper” Versus Reality of Preparedness</b></p>	<p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ There is limited, non-systematic testing and exercising of emergency health plans, and inconsistent mechanisms for incorporating lessons learned into future planning.</li> <li>▲ Plans are often limited to only the public health response, are not well coordinated with other emergency responders, and do not usually include how to involve the private sector and surrounding community.</li> <li>▲ Lingering questions remain about the gaps in the public health and healthcare system response to Hurricane Katrina.</li> </ul>
<p><b>Dramatic Lab Improvements; Reagent Shortage Remains a Problem</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ Thirty-nine states reported sufficient bio-testing capabilities in 2006; an increase from six in 2003.</li> <li>▲ Forty-six states report sufficient numbers of trained scientists to test for possible anthrax and plague outbreaks; an increase from 10 in 2004.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ CDC is unable to keep up with state demands for reagents, the materials needed to test for biological threats.</li> </ul>

## Five Years After 9/11: Summary of Key Preparedness Improvements and Concerns

<p><b>More States with National Electronic Disease Surveillance System (NEDSS); But Public Health Information Technology is Not Up-to-Date</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ Thirty-eight states are compatible with the CDC’s National Disease Surveillance System (NEDSS), allowing for more integrated, accurate, and timely national disease reporting; an increase from 18 in 2004.</li> <li>▲ At least seven additional states plan to meet NEDSS compatibility criteria in 2007.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ Independent evaluations of public health IT systems find non-integrated, uncoordinated systems that are often duplicative and problems with consistency of data.</li> </ul>
<p><b>State Public Health Funding Rebounds, But Remains Inadequate</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ Only six states cut their funding for public health from FY 2004-05 to FY 2005-06; a dramatic improvement from 33 states cutting funds in 2003.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ However, the median state spending for public health is only \$31 per person per year. Approximately \$2.6 billion more would be needed just to equalize spending across states.</li> </ul>
<p><b>Problems with Management and Contents of the Strategic National Stockpile (SNS)</b></p>	<p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ Only 14 states and two cities are rated at the highest preparedness level for distributing and administering vaccines and antiviral medications from the SNS.</li> <li>▲ States have not received clear information about what types and quantities of medications and supplies are in the SNS and how effective the federal government would be in delivering supplies to states during a multi-state crisis.</li> </ul>
<p><b>Fragile Vaccine Industry and Limited Public Health Research and Development</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ Congress appropriated approximately \$5 billion for pandemic flu preparedness activities, including vaccine research and development</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ The U.S. vaccine industry is broken, and there is limited incentive for companies to pursue research and development into new vaccines.</li> </ul>
<p><b>Extremely Limited Surge Capacity for Emergencies</b></p>	<p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ There is a growing public health professional and nursing workforce shortage.</li> <li>▲ Volunteer medical workforce efforts are limited.</li> <li>▲ Ongoing concerns exist about policies to encourage healthcare workers to continue coming to work in the event of a major infectious outbreak.</li> <li>▲ Shortfalls exist in facilities, beds, medical supplies, and equipment to respond to major outbreaks.</li> </ul>
<p><b>Outdated Risk Communication and Insufficient Inclusion of the Public in Planning</b></p>	<p><b>Progress:</b></p> <ul style="list-style-type: none"> <li>▲ All 50 states have held a summit on pandemic flu.</li> <li>▲ The federal government launched <a href="http://www.pandemicflu.gov">www.pandemicflu.gov</a> as a resource for both the public and health community.</li> </ul> <p><b>Concerns:</b></p> <ul style="list-style-type: none"> <li>▲ Risk communication strategies are out of-date. Limited efforts exist to inform and prepare the public for future health emergencies and to modernize strategies for information dissemination during emergencies.</li> <li>▲ No systematic effort has been made to include the public in emergency planning or to address public concerns.</li> <li>▲ Concerns for responding to “special needs” communities remain largely unaddressed.</li> </ul>

## ALL-HAZARDS APPROACH TO EMERGENCY PUBLIC HEALTH THREATS

The public health system is responsible for protecting the public from a range of potential health threats. An **all-hazards** public health system is one that is able to respond to and protect citizens from the full spectrum of possible public health emergencies, including bioterrorism and naturally occurring health threats. An all-hazards system recognizes that preparing for one threat can have benefits that will help prepare the system for all potential threats.

According to a summer 2006 analysis of a Community Tracking Survey (CTS) in *Health Affairs*, the “federal government’s ‘all-hazards approach’ has facilitated investments that benefit the public health system as a whole. Most communities reported using bioterrorism funding to create multiple-use systems that can respond to a range of events including terrorism. By investing in such areas as communications, epidemiology, and lab capacity, health departments have strengthened core functions that contribute to the success of various public health activities.”<sup>2</sup>

Under an all-hazards approach, the public health system prepares for and is able to respond to unique concerns posed by different threats. For instance, threats may be:

- Isolated regionally or be national or global in scope;
- For a limited duration or occur in prolonged waves; and
- Preventable and treatable through vaccines and medications, or there may be no pharmaceutical interventions available.

## EXAMPLES OF MAJOR EMERGENCY PUBLIC HEALTH THREATS

- **Agroterrorism:** The “deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability.”<sup>3</sup> Agroterrorism can be considered a sub-category of “bioterrorism” and food-borne diseases.
- **Bioterrorism:** The intentional or deliberate use of germs, bio-toxins, or other biological agents that cause disease or death in people, animals, or plants. Examples include **anthrax, smallpox, botulism, salmonella, and E. coli.**
- **Chemical terrorism:** The deliberate use of chemical agents, such as **poisonous gases, arsenic, or pesticides**, which have toxic effects on people, animals, or plants in order to cause illness or death. Examples include **ricin, sarin, and mustard gas.**
- **Chemical incidents and accidents:** The non-deliberate exposure of humans to harmful chemical agents, with similar outcomes to chemical terrorism.
- **Food-borne diseases:** Animal or plant diseases, which cause harm to humans. The CDC estimates that there are approximately 75 million reported cases of food-borne diseases each year in the United States, causing approximately 325,000 hospitalizations and 5,000 deaths. Examples include **botulism, salmonella, E.coli O157:H7, shigella, and norovirus.**
- **Natural disasters:** Harm can be inflicted during and after natural disasters, which can lead to the disruption of regular healthcare and leave portions of the population with ongoing care needs. Examples include **hurricanes (such as Hurricane Katrina), earthquakes, tornados, mudslides, fires, and tsunamis.**
- **Pandemic flu:** A **novel, potentially lethal strain of the flu** against which humans have no natural immunity. According to estimates from the U.S. Department of Health and Human Services (HHS), a severe pandemic could result in 1.9 million deaths and 9.9 million hospitalizations in the U.S.
- **Radiological threats:** Intentional or accidentally-caused exposure to radiological material. A terrorist attack could involve the scattering of radioactive materials through the use of explosives (“**dirty bomb**”), the **destruction of a nuclear facility**, the introduction of **radioactive material into a food or water supply**, and the **explosion of a nuclear device** near a population center.
- **Vector-borne diseases:** Diseases spread by vectors, such as insects. Examples include: **West Nile virus, Rocky Mountain spotted fever, and malaria.**
- **Waterborne diseases:** According to the CDC, over 1,000 persons become ill from contaminated drinking water and over 2,500 persons become ill from recreational water disease outbreaks annually in the U.S.<sup>4</sup>
- **Waterborne terrorism:** The deliberate contamination of the nation’s water supply.
- **Zoonotic/Animal-borne diseases:** Animal diseases that can spread to humans, and in some cases can become contagious from human to human. Examples include: **Avian flu, rabies, and SARS.**

## WHAT DOES ALL-HAZARDS PREPAREDNESS LOOK LIKE?

### The goals of 24/7 public health emergency response include:

- **Rapid detection** of emergency disease threats, including those caused by bioterrorism.
- Intensive **investigative** capabilities to quickly diagnose a rising disease threat or identify the biological or chemical agent used in an attack.
- **Surge capacity** for mass events, including adequate facilities, equipment, supplies, and trained health professionals.
- **Mass containment strategies**, including pharmaceuticals needed for **wide-scale vaccination, antibiotic, or antidote administration** and **isolation and quarantining** when necessary.
- Streamlined and effective **communication** channels so health workers can swiftly and accurately communicate with each other, other front line workers, and the public about 1) the nature of an emergency or attack, 2) the risk of exposure and how to seek treatment when needed, and 3) any actions that they or their families should take to protect themselves. Communications must also be able to reach and take into consideration vulnerable, disadvantaged, and other special needs populations.

### What it will take to achieve basic levels of preparedness:

- **Leadership, planning, and coordination:** An established chain-of-command and well-defined roles and responsibilities for seamless operation across different medical and logistical functions and among federal, state, and local authorities during crisis situations, including police, public safety officials, and other first responders.
- **An expert and fully-staffed workforce:** Highly trained and adequate numbers of public health professionals, including healthcare providers, epidemiologists, lab scientists, and other experts, in addition to backup workers for surge capacity conditions.
- **Modernized technology:** State-of-the-art laboratory equipment, information collection, and health tracking systems.
- **Pre-planned, safety-first rapid emergency response capabilities and precautions:** Tested plans and safety precautions to mitigate potential harm to communities, public health professionals, and first responders.
- **Immediate, streamlined communications capabilities:** Coordinated, integrated communications among all parts of the public health system, all frontline responders, and with the public. Must include back-up systems in the event of power loss or overloaded wireless channels.

## FEDERAL, STATE, AND LOCAL PUBLIC HEALTH JURISDICTIONS

The federal role: Includes policymaking, the financing of activities, overseeing national disease prevention efforts, collecting and disseminating health information, building capacity, and directly managing some services.<sup>5</sup> Some public health capabilities, such as the Strategic National Stockpile (SNS), are “federal assets” managed by federal agencies that are available for use by states and communities in the event of emergencies. Public health functions are widely diffused across eight federal agencies and two offices.

State and local roles: Under U.S. law, state governments have primary responsibility for the health of their citizens. Constitutional “police powers” give states the ability to enact laws and issue regulations to protect, preserve, and promote the health, safety, and welfare of their residents. In most states, state laws charge local governments with responsibility for the health of their citizens.

### Some of the ongoing problems resulting from this structure include:

1. Lack of clear roles for the various state, local, and federal agencies.
2. Limited coordination among the levels of government, including determination of how federal assets would be deployed to states and localities, and across jurisdictions, such as sharing assets and resources among states.
3. No minimum standards, guidelines, or recommendations for capacity levels or services required of state and local health departments. This results in major differences in services and competencies across state and local agencies.
4. Problems arising from federal funding that is largely based on categorical or program grants, which are often restrictive and lack a system of accountability.
5. Ineffective and random capacity to coordinate with nongovernmental organizations, community groups, and the private sector.

**Issues of Accreditation:** In response to a 2002 Institute of Medicine (IOM) report that “called on the public health community to consider how accreditation ultimately could prompt improvements in the nation’s health,” the Association of State and Territorial Health Officials (ASTHO) and the National Association of County and City Health Officials (NACCHO), with funding from the CDC and the Robert Wood Johnson Foundation, created the Exploring Accreditation project. In the fall of 2006, the project’s 25-member steering committee released a new model for a voluntary national public health accreditation program. Key recommendations included the development of accreditation standards to promote continuous quality improvement and accountability for public health, including performance measures.<sup>6</sup>

Some states have taken the lead in public health accreditation. For instance, in 2002, the North Carolina Division of Public Health and the North Carolina Association of Local Health Directors “undertook an initiative to develop a mandatory, standards-based system for accrediting local public health departments throughout the state.”<sup>7</sup> The program consists of “an agency self[-]assessment, which includes 41 benchmarks and 145 activities; a three day site visit by a multidisciplinary team of peer volunteers; and determination of accreditation status by the North Carolina Local Health Department Accreditation Board.”<sup>8</sup>

Additionally, the Multi-State Learning Collaborative for Performance and Capacity Assessment or Accreditation of Public Health Departments (MLC) convened five “states to study key components of the state-based assessment/accreditation programs. The project is funded by the Robert Wood Johnson Foundation and managed by the National Network of Public Health Institutes and the Public Health Leadership Society.”<sup>9</sup> Illinois, Michigan, Missouri, North Carolina, and Washington were the five states chosen from 18 that applied to participate in the collaboration. The goal of the MLC is to develop and disseminate best practices to their peers in other states to ultimately “strengthen the effectiveness of governmental public health agencies.”<sup>10</sup>



# State-By-State Health Preparedness Indicators And Scores

## WHY STUDY STATES' PREPAREDNESS?

Each of the 50 states has primary legal jurisdiction and responsibility for the health of its citizens under the U.S. Constitution. The states differ in how they structure and deliver public health services. In some states, the public health system is centralized, and the state has direct control and supervision over local health agencies. In other states, local public health agencies developed separately from the state and are run by counties, cities, or townships, and usually report to one or more elected officials.<sup>11</sup>

Each state has different strengths, weaknesses, and unique challenges that impact its ability to prepare for and respond to public health emergencies. Citing weaknesses and challenges in this report is not done for punitive purposes, but rather to help identify where and how to make improvements or overcome obstacles. Additionally, providing information about which states have particular strengths allows other states to know which states to turn to for best practices and models to guide their preparedness efforts.

All Americans have the right to expect fundamental health protections during public health emergencies no matter where they live. Members of the public also deserve to know how prepared their states and communities are for different types of health threats, particularly when their taxpayer dollars are being spent to support preparedness efforts. Currently, Americans are not receiving the information they need to make decisions about how to protect themselves and their families in the event of public health emergencies. Also, they are not equipped with enough information to monitor and hold public officials accountable for whether or not their communities are adequately prepared.

Two examples of public health protections that Americans in every community should expect include: emergency response to disasters, such as a hurricane or earthquake, and the containment of infectious diseases with the potential for mass-contagion.

## State Scores

To help assess health emergency preparedness capabilities, each state received a score based on 10 key indicators. States received one point for achieving an indicator or zero points if they did not achieve the indicator. Zero was the lowest possible overall score and 10 the highest. Taken collectively, these indicators offer a composite snapshot of preparedness, including strengths and vulnerabilities.

Very limited data are available to measure public health preparedness. Many key components of preparedness are not sufficiently measured or the data are not made available. TFAH compiles these indicators based on the best avail-

able data. The indicators focus on key areas of preparedness using the limited data currently available for all 50 states and D.C. TFAH has called for the government to develop national performance standards and to publicly release information on a routine basis about the states' performance in meeting these standards. The indicators were selected based on:

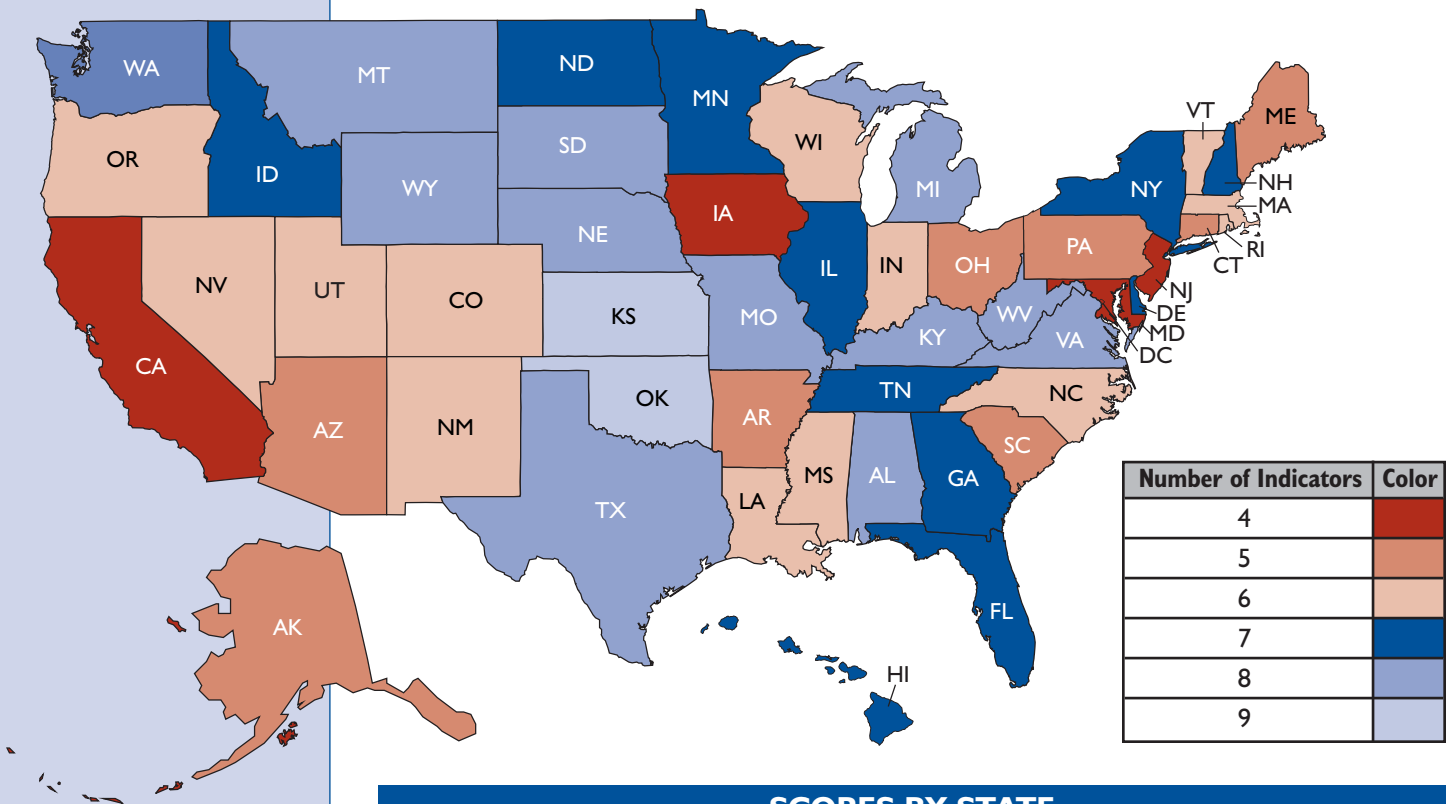
- If they reflect a fundamental, systemic public health need;
- Consultation with key experts about areas important to serving basic public health emergency needs; and

■ The availability of state level data, which were verifiable through independent means or consultation with states.

Scores are not based on an absolute scale of success, but indicate relative achievements in areas of preparedness, and highlight areas where increased prioritization and investment must be made to address problems. Additional measures have been proposed or may be used for other purposes. However, the data for the outcomes of these measures are not made available on a state-by-state basis. Many states have taken action

in other areas of preparedness or may be in the process of increasing certain capabilities that are not reflected in this report.

More than half of states scored six or less. Twelve states and D.C. scored five or less. Kansas and Oklahoma scored the highest, with a score of nine. California, Iowa, Maryland, and New Jersey scored the lowest, achieving a score of four. No state scored below a four. States with stronger surge capacity capabilities and immunization programs scored higher this year, with four measures focused on these capabilities.



SCORES BY STATE					
9 (2 states)	8 (12 states)	7 (11 states)	6 (13 states)	5 (8 states & D.C.)	4 (4 states)
Kansas Oklahoma	Alabama Kentucky Michigan Missouri Montana Nebraska South Dakota Texas Virginia Washington West Virginia Wyoming	Delaware Florida Georgia Hawaii Idaho Illinois Minnesota New Hampshire New York North Dakota Tennessee	Colorado Indiana Louisiana Massachusetts Mississippi Nevada New Mexico North Carolina Oregon Rhode Island Utah Vermont Wisconsin	Alaska Arizona Arkansas Connecticut D.C. Maine Ohio Pennsylvania South Carolina	California Iowa Maryland New Jersey

## STATE PREPAREDNESS SCORES

States	1 Achieved "green" status for Strategic National Stockpile Delivery	2 Has sufficient BSL-3 labs	3 Has enough lab scientists to test for anthrax or plague	4 Has year round lab based influenza surveillance	5 Has two weeks hospital bed surge capacity in moderate pandemic	6 Increased or maintained seasonal flu vaccination rate for adults over age 65	7 At or above nat'l median for # of adults over age 65 who have ever received a pneumonia vaccination	8 Compatible with CDC National Electronic Disease Surveillance System	9 Does NOT have a nursing workforce shortage	10 Increased or maintained level of funding for public health services from FY 2005 to FY 2006	2006 Total Score
Alabama	✓	✓	✓	✓	✓	✓		✓	✓	8	
Alaska			✓	✓	✓	✓			✓	5	
Arizona		✓	✓	✓			✓		✓	5	
Arkansas		✓	✓	✓	✓	✓				5	
California		✓	✓	✓					✓	4	
Colorado			✓	✓		✓	✓		✓	6	
Connecticut			✓	✓		✓	✓		✓	5	
Delaware	✓	✓	✓	✓			✓		✓	7	
District of Columbia			✓	✓	✓	✓			✓	5	
Florida	✓	✓	✓	✓		✓	✓		✓	7	
Georgia		✓	✓	✓	✓	✓	✓		✓	7	
Hawaii		✓	✓	✓			✓		✓	7	
Idaho			✓	✓	✓	✓			✓	7	
Illinois	✓	✓	✓	✓	✓	✓	✓		✓	7	
Indiana		✓	✓	✓	✓	✓			✓	6	
Iowa					✓	✓	✓		✓	4	
Kansas		✓	✓	✓	✓	✓	✓	✓	✓	9	
Kentucky		✓	✓	✓	✓	✓	✓	✓	✓	8	
Louisiana	✓				✓	✓	✓		✓	6	
Maine		✓	✓	✓	✓		✓			5	
Maryland			✓	✓			✓		✓	4	
Massachusetts		✓	✓	✓		✓	✓		✓	6	
Michigan	✓	✓	✓	✓		✓	✓	✓		8	
Minnesota		✓	✓	✓	✓	✓	✓		✓	7	
Mississippi	✓	✓	✓	✓	✓	✓				6	
Missouri	✓	✓	✓	✓	✓	✓	✓		✓	8	
Montana		✓		✓	✓	✓	✓	✓	✓	8	
Nebraska		✓	✓	✓	✓	✓	✓		✓	8	
Nevada		✓	✓	✓			✓		✓	6	
New Hampshire		✓	✓	✓		✓	✓		✓	7	
New Jersey		✓	✓				✓		✓	4	
New Mexico		✓	✓	✓		✓	✓		✓	6	
New York	✓	✓	✓	✓		✓	✓		✓	7	
North Carolina		✓	✓	✓		✓			✓	6	
North Dakota		✓		✓	✓	✓	✓		✓	7	
Ohio			✓		✓	✓	✓		✓	5	
Oklahoma		✓	✓	✓	✓	✓	✓	✓	✓	9	
Oregon			✓	✓		✓	✓		✓	6	
Pennsylvania		✓	✓	✓			✓			5	
Rhode Island	✓		✓	✓			✓		✓	6	
South Carolina		✓	✓	✓			✓		✓	5	
South Dakota		✓	✓	✓	✓	✓	✓	✓		8	
Tennessee	✓	✓	✓	✓	✓	✓	✓		✓	7	
Texas	✓	✓	✓	✓	✓	✓	✓		✓	8	
Utah		✓	✓	✓		✓	✓		✓	6	
Vermont			✓	✓			✓	✓	✓	6	
Virginia	✓	✓	✓	✓		✓	✓		✓	8	
Washington	✓	✓	✓	✓		✓	✓		✓	8	
West Virginia		✓	✓	✓	✓	✓		✓	✓	8	
Wisconsin		✓	✓	✓		✓		✓	✓	6	
Wyoming		✓	✓	✓	✓	✓	✓		✓	8	
<b>Total</b>	<b>14</b>	<b>39</b>	<b>46+D.C.</b>	<b>46+D.C.</b>	<b>25+D.C.</b>	<b>37+D.C.</b>	<b>26</b>	<b>38</b>	<b>10</b>	<b>44+D.C.</b>	

Indicators reflect states' use of funds received through CDC and HRSA bioterrorism and public health "cooperative agreement" grants, other health capacity readiness programs, and state public health funds for health emergency preparedness. (See Appendix A for more information on the CDC and HRSA preparedness funds to states and Indicator 10 for state public health budget information.) Three additional cities, New York, Chicago, and Los

Angeles, also receive funds directly from public health preparedness grants, but were not included in the study due to limited data availability.

Data for these indicators were drawn from a range of publicly available sources, the CDC, a survey conducted by the Association of Public Health Laboratories (APHL), public announcements from states, and interviews with government officials.

Indicators	What the indicators measure
1. Did the state meet the CDC's highest rating for preparedness to distribute emergency vaccines, antidotes, and medical supplies from the <b>Strategic National Stockpile (SNS)</b> ?	This indicator demonstrates states' abilities to quickly vaccinate or provide medications to communities during emergencies.
2. Does the state lab director report having sufficient laboratory capabilities to <b>test for biological threats</b> ?	This indicator demonstrates states' abilities to quickly identify a bioterror attack, substances that may be used in an attack, or a major infectious disease outbreak. Identification of an outbreak and individuals who have been exposed or are symptomatic drive decisions about treatment and containment. The need for bio-lab capabilities was evident during the anthrax attacks of 2001.
3. Does the state lab director report having a sufficient number of laboratory experts trained to <b>test for a suspected outbreak of anthrax or the plague</b> ?	This indicator reflects whether states have enough professionals trained to perform the tests needed for a biological threat, including the extra staff required to manage the additional testing needed during a major scare.
4. Does the state <b>test for the flu on a year-round basis</b> ?	This indicator is important since a pandemic could strike at any time of the year, not just during regular flu season.
5. Does the state have enough <b>hospital bed capacity</b> to accommodate the estimated number of people who would need to be hospitalized within the first two weeks of a moderate pandemic flu outbreak?	This indicator helps evaluate states' abilities to care for additional patients during major emergencies, when extra hospital bed capacity would be critical.
6. Did the state increase its rates for <b>immunizing adults aged 65 and older for the seasonal flu</b> ?	Immunizing seniors against the seasonal flu is a public health priority, since seniors are at high risk for developing serious health complications as a result of contracting the flu. Seasonal flu vaccination efforts are also viewed as a way to help communities better prepare for larger public health emergencies, such as a pandemic flu outbreak, that would require mass or targeted vaccinations or distribution of medications. This indicator helps measure both public health concerns. It examines a state's progress over time.
7. Did the state reach the national median for <b>vaccinating adults aged 65 and older for pneumonia</b> ?	This indicator helps measure states' abilities to vaccinate at-risk populations on a cumulative basis compared to other states. HHS has set a national goal of immunizing 90 percent of seniors for pneumonia by the year 2010. Pneumonia is one of the serious complications that can arise for seniors who contract the flu, and can prove to be lethal.
8. Does the state use a <b>disease surveillance</b> system that is compatible with CDC's national system, including integrating data from multiple sources, using electronic lab reporting, and using an Internet browser system?	This indicator demonstrates information about which states track health threats in a way that is compatible with the standards of the CDC's National Electronic Disease Surveillance System (NEDSS). This system makes it possible to quickly identify and track outbreaks and to share the information in a consistent way across health agencies and states.
9. Does the state have a sufficient number of <b>registered nurses</b> ?	This indicator helps measure each state's healthcare workforce capacity. A nursing shortage would be especially problematic during a public health emergency when an influx of additional patients would need care.
10. Did the state maintain or increase <b>funding for public health</b> programs from FY 2004-05 to FY 2005-06?	This indicator demonstrates states' commitment to funding public health programs, which support the infrastructure needed to adequately respond to emergencies.

## INADEQUATE TRANSPARENCY AND ACCOUNTABILITY FOR PUBLIC HEALTH PREPAREDNESS

While the *Ready or Not?* reports in 2003, 2004, and 2005 also contained 10 indicators, these indicators are adapted annually to reflect changing expectations for preparedness and changes in the state preparedness data that are made publicly available each year.

TFAH has repeatedly called for greater availability of data from federal and state governments to better inform the American people about how prepared the country and their states and local communities are to meet health threats and hold public officials accountable.

**In the absence of government-supported and publicly available data, this report concentrates on 10 measurable performance indicators from a variety of public sources to help supply policymakers and the public with information about the nation’s preparedness for health emergencies.**

### Indicator 1: STRATEGIC NATIONAL STOCKPILE

**FINDING:** Only 14 states and two cities are rated at the highest preparedness level required to provide emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile.

14 states and 2 cities have achieved “green” or “green minus” status for Strategic National Stockpile delivery and administration capabilities (1 point)**	36 states and D.C. have NOT achieved “green” or “green minus” status for Strategic National Stockpile delivery and administration capabilities (0 points)	
Alabama	Alaska	Nebraska
Chicago*	Arizona	Nevada
Delaware	Arkansas	New Hampshire
Florida	California	New Jersey
Illinois	Colorado	New Mexico
Louisiana	Connecticut	North Carolina
Michigan	D.C.	North Dakota
Mississippi	Georgia	Ohio
Missouri	Hawaii	Oklahoma
New York	Idaho	Oregon
New York City*	Indiana	Pennsylvania
Rhode Island	Iowa	South Carolina
Tennessee	Kansas	South Dakota
Texas	Kentucky	Utah
Virginia	Maine	Vermont
Washington	Maryland	West Virginia
	Massachusetts	Wisconsin
	Minnesota	Wyoming
	Montana	

Sources: CDC and state health officials.

\* Chicago and New York City have achieved “green” status as cities separately from their states.

The CDC measures states' preparedness to distribute the Strategic National Stockpile (SNS) based on a "stop-light" color model. Green represents the highest level of preparedness, amber represents the middle, and red is the lowest. The CDC has not released the specific criteria for achieving different SNS status levels, but notes the assessment includes a review of a state's public health emergency cooperative agreement plans and an evaluation of critical response functions including: "Command and Control; Receipt, Stor[age] and Stag[ing]; Inventory Control; Distribution; Dispensing; Repackaging; Communications and Security."<sup>12</sup> The agency releases an aggregate tally of the number of states and cities that reach the different color levels. TFAH receives information on the SNS status of states by reviewing public announcements issued by states and through interviews with state officials.

CDC officials report that as of September 2006, the SNS rating system has been

### CDC's Aggregate Tallies of States' Strategic National Stockpile Readiness Status, As of October 2006

Green	7
Green Minus	9
Amber Plus	9
Amber	12
Amber Minus	6
Red Plus	7
Red	4

*Note: The tallies above include all 50 states, plus New York City, Los Angeles County, D.C., and Chicago. The CDC measurement system also gives states "plus" or "minus" designations within their color categories. This chart includes the "plus" and "minus" scores with the "green," "amber," and "red" designees.*

changed to use two new assessment tools developed in partnership with the RAND Corporation, one focusing on states and one on localities. The rating system is now going to be measured on a 100 point scale instead of the color system.<sup>13</sup>

### STATE CONCERNS WITH THE SNS PROGRAM

In 2005, TFAH surveyed state emergency health officials in eight states to identify progress and concerns with the SNS program. The survey was based on a hypothetical model using smallpox, a model which would be relevant across "all hazards" that call for mass vaccination of the population. The state officials' key concerns included:

- Lack of clear information from federal officials about quantities of vaccines or equipment that would arrive for a mass vaccination event. For instance, there is concern that the supplies are limited in scope and might leave states unprepared for different types of threats.
- States are often unclear about what criteria they are being evaluated on, including what constitutes green, amber, or red status.
- Questions about how the SNS could be deployed to all 50 states simultaneously, which would be necessary for some threats such as a pandemic flu. Most officials interviewed indicated their planning assumed that states would receive supplies at different times.
- Shortages of healthcare workers during a major crisis.
- Differences among state policies could confuse the public and healthcare workers, such as decisions about timing for administering vaccinations.

## THE STRATEGIC NATIONAL STOCKPILE (SNS)

The SNS is a national repository of antibiotics, chemical antidotes, antitoxins, various pharmaceuticals, and other medical supplies and equipment to be used in the event of a terrorist attack or major natural disaster. The stockpile is kept in 12 undisclosed locations throughout the United States which contain a “12-hour push package” of materials which are supposed to be able to be delivered anywhere in the United States within 12 hours of the decision to deploy. There is a “vendor-managed inventory” component to the SNS, where some manufacturers maintain control of the SNS supplies.<sup>14</sup> Some of the contents of the stockpile include:<sup>15</sup>

- Smallpox vaccine for the entire U.S. population.
- “Millions” of doses of countermeasures against anthrax, plague, and tularemia.
- Botulinum antitoxin (which the Department of Defense started stockpiling in the early 1990s).
- Countermeasures to address radiation exposure (including diethylenetriaminepentaacetate [DTPA] and Prussian Blue).
- Potassium iodide, which protects the thyroid from radioactive iodide.
- Over one million doses of the licensed anthrax vaccine (with more ordered).<sup>16</sup>

On ongoing criticism is the lack of an “end-to-end” strategy that encompasses the development of the products through decisions about how and by whom countermeasures would be administered.

Little information is available about quantities of supplies in the SNS. There is also limited information about the availability of medications in the SNS to manage chronic diseases, which is often an issue that arises during emergencies when regular supply chains for medications are unavailable.

The stockpile, which is considered a federal asset, is managed by HHS out of the CDC, in coordination with the Department of Homeland Security (DHS).

Governors, the president, and, in some cases, state health officers can request deployment of the SNS. The federal government is responsible for delivering the medical supplies to states, which then are responsible for distributing the materials to their citizens. A handful of federal technical advisors help advise local authorities, but otherwise the distribution and administration of the SNS becomes the responsibility of the states and localities.

### Special concerns about pandemic flu countermeasures - storage and shelf-life

The federal cache of antiviral medication to counter a pandemic flu is contained in the SNS. As of November 2006, according to CDC officials, the SNS contains approximately 20.6 million regimens of Tamiflu capsules (oseltamivir) and has an additional 8.9 million on order, that are expected to arrive by March 2007.<sup>17</sup> In addition, the SNS contains approximately 8.4 million regimens of Relenza (zanamivir) with an additional 6 million regimens on order.

The federal government has plans to purchase 50 million courses of antiviral medications to be stored in the SNS. The states have been given the option of purchasing 31 million of these courses, using a 25 percent subsidy from HHS. If all of the states choose to purchase their optional allotments, it would cover 25 percent of the U.S. population. Additionally, the state stockpiles of antivirals are not contained in the SNS, and “no decisions have been made on whether states will be allowed to contract with SNS for storage of their antivirals.”<sup>18</sup> States must individually determine how to store and distribute their stockpiles of medication separately. And since the state-purchased antivirals are not part of the SNS, it is not eligible for the federal “shelf-life extension program,” which means the states will have to pay to replace their stockpile of antivirals when the drugs expire.<sup>19</sup> Questions also remain about the stockpiling and distribution of syringes and needles.

## CHEMPACK

CHEMPACK is a sub-unit of the SNS program, created to build repositories of nerve agent antidotes for response to a chemical or nerve agent attack. The response time to treat nerve agent and chemical exposure is much shorter than the 12 hours required to deploy the SNS, so CHEMPACK is maintained separately and is housed in local jurisdictions throughout the country in order to be available for faster use.

There are issues with the CHEMPACK program. According to CDC officials, as of November 2006, only 1,262 of the approximate goal of 2,000 CHEMPACK containers have been set up in states across the country. The containers are stored in designated sites, such as in hospitals, which best support states' emergency response plans.<sup>20</sup>

Also, *CHEMPACK only includes nerve agent antidotes*. It does not include antidotes for some chemical blood or blister agents, such as hydrogen cyanide (which is commercially used in 41 states) and lewisite (a blister agent used in World War I).

It is unclear what support would be available for chemical attacks or accidents where there is no antidote available (such as with chlorine or mustard gas). There are also "shelf-life" concerns for the materials in CHEMPACK, which need to be systematically replaced based on expiration dates.

The antidote contents reported to be available in CHEMPACKs include atropine, which "alleviates symptoms such as excess salivation, urination, defecation, vomiting, and excess secretions;" pralidoxime, which "helps reactivate the enzyme that is compromised by the nerve agent and alleviates symptoms such as muscle weakness, rapid heart rate, high blood pressure, and muscle twitching;" and diazepam, which "stops seizures that may occur."<sup>21</sup> There is limited information available on the quantities of antidotes available in the CHEMPACKs.

## Indicator 2: PUBLIC HEALTH LABORATORIES – BIOLOGICAL TESTING CAPABILITIES

**FINDING:** Eleven states and D.C. report that they do not have adequate bio-threat response laboratory capabilities (facilities, technology, and/or equipment).

39 states report they do have adequate bio-safety level 3 (BSL-3) laboratories to meet anticipated preparedness needs as outlined in their state's bioterrorism preparedness plan (1 point)		11 states and D.C. report they do NOT have adequate bio-safety level 3 (BSL-3) laboratories to meet anticipated preparedness needs as outlined in their state's bioterrorism preparedness plan (0 points)
Alabama	Nevada	Alaska
Arizona	New Hampshire	Colorado
Arkansas	New Jersey	Connecticut
California	New Mexico	D.C.
Delaware	New York*	Idaho
Florida	North Carolina	Iowa
Georgia	North Dakota	Louisiana
Hawaii	Oklahoma	Maryland
Illinois	Pennsylvania	Ohio
Indiana	South Carolina	Oregon
Kansas	South Dakota	Rhode Island
Kentucky	Tennessee	Vermont
Maine	Texas	
Massachusetts	Utah	
Michigan	Virginia	
Minnesota	Washington	
Mississippi	West Virginia	
Missouri	Wisconsin	
Montana	Wyoming	
Nebraska		

Source: APHL September-October 2006 survey.

\*New York did not respond to the survey, but had indicated sufficient capabilities in the past. Puerto Rico responded that it did NOT have sufficient BSL-3 capabilities.

Public health laboratories are responsible for identifying naturally occurring and man-made health threats. Their identification and diagnosis process is crucial for developing strategies to contain the spread and facilitate the rapid treatment of diseases.

Eleven states report they do not have sufficient capacity to conduct laboratory tests during a bioterrorism emergency. In 2003, 44 states did not have sufficient bioterrorism laboratory capacity, indicating a major increase in capacity in the last three years.

Bioterrorism lab capacity includes having enough equipment and staff to safely handle “infectious agents that may cause serious or potentially lethal disease as a result of

exposure” via inhalation.<sup>22</sup> Labs with this capacity are designated with a bio-safety level 3 (BSL-3) rating.

The nation’s public health laboratories encompass a “loose network of federal, state, and local laboratories that work in undefined collaboration with private clinical laboratories.”<sup>23</sup> The 2001 anthrax attacks demonstrated the need to upgrade and continue to maintain public health labs. The labs were quickly overwhelmed with samples from around the country, and were often left to conduct tests with inadequate equipment, facilities, and expert staff, leaving the nation more vulnerable and slower to respond. Response time would have been faster if lab capacity had been upgraded.<sup>24</sup>

## LABORATORY RESPONSE NETWORK

Instead of bolstering lab capacity in each state, a Laboratory Response Network (LRN) was established in 1999 to provide “surge capacity” support to states. Overseen by the CDC, the LRN is an integrated network of approximately 150 labs encompassing federal, state, local, veterinary, military, environmental, food testing, and international labs.<sup>25</sup>

The LRN provides emergency assistance and support through the pooling of resources and personnel based on cooperative agreements. During the anthrax attacks of 2001, a Florida LRN lab conducted over one million separate anthrax tests. Some experts note that police, military, and Federal Bureau of Investigation lab facilities would also be used during a crisis.

### **Laboratory Response Network (LRN) Faces Critical Shortage of Reagents -- Delays from CDC a Problem<sup>26</sup>**

The laboratories that comprise the national Laboratory Response Network (LRN) are wholly dependent upon the Centers for Disease Control and Prevention (CDC) for the supply of the diagnostic materials that are required to analyze suspect samples for biological agents. These materials, called reagents, are currently only produced at CDC and the level of production has been unable to keep up with the demand for reagents that has occurred as additional laboratories have become part of the LRN.

The Association of Public Health Laboratories (APHL) has regularly called on Congress and the Administration to address this shortage by providing additional funding to CDC that would allow them to both increase their in-house production of reagents and to consider out-sourcing some reagent production to viable contractors. The CDC has dedicated \$3 million to reagent production in fiscal year 2006, and that amount is scheduled to continue in fiscal year 2007. While certainly a step in the right direction, a much more concerted effort is required before the LRN will be able to be considered fully operational.

During the fall of 2005, 83 of the 98 state and local public health LRN labs responded to a survey about delays in receipt of reagents from the CDC. Key findings from the survey included:

- Fifty-one labs experienced delays in receipt of reagents between August 2004 and October 2005;
- Delays of one to two weeks were seen for seven of the nine reagents in question, while a delay of more than one month was seen for one specific reagent; and
- Thirty-eight labs reported that the delay did not adversely affect their testing, largely because no urgent testing was needed during that time. However, if an emergency or a hoax had occurred, the delay would have been problematic.

Based on these findings, APHL recommended:

- Creation of an adequate national reagent supply and stockpile similar to the SNS of various pharmaceuticals;
- Congressional appropriation to CDC for such a stockpile;
- Sustained and dedicated federal funding for ongoing demand for LRN reagents; and
- Mandatory maintenance of an accurate and updated inventory of reagents by LRN Reference Level laboratories.

## PUBLIC HEALTH LABS - CHEMICAL TESTING

As of October 2006, 10 states have the capacity (facilities, technology, equipment, and/or staffing) to adequately test for chemical threats. This capability to test human samples, including blood, saliva, and urine for chemical exposure, is called “biomonitoring.” The states are California, Florida, Massachusetts, Michigan, Minnesota, New Mexico, New York, South Carolina, Virginia, and Wisconsin.<sup>27</sup> The number has not changed since 2005, but is an increase from zero in 2003 and five in 2004.

The CDC only provides enough funds to cover grants for 10 states to have the equipment and resources for biomonitoring. The number of state labs with chemical testing capabilities is unlikely to rise without increased federal investment in biomonitoring capabilities. No state has independently provided funds to its public health labs to establish biomonitoring capabilities. Yet, these tests could help identify the substance used in an attack, driving decisions about containment and treatment, and the individuals who have been exposed and their level of harm.

According to the CDC, there are over 60 toxic substances that could be used as chemical weapons by terrorists.<sup>28</sup> Many of these are regularly used commercial and industrial chemicals that could be “weaponized.”

Biomonitoring can also be used to test communities for exposure to toxins not resulting from terrorist attacks, such as toxins found in polluted air or water, and to help identify the level of harm that these exposures might cause. In this capacity, biomonitoring can be used as a helpful tool to identify or rule out potential causes or contributing factors to a number of health problems.

### Chemical Laboratory Response Network<sup>29</sup>

States have begun to collaborate on chemical terrorism testing on a regional basis given the lack of federal funding for each state to establish its own capabilities.

- Sixty-two state, territorial, and metropolitan public health labs participate in a “chemical laboratory response network.”
- Thirty-seven of these labs have “Level 2” status, where personnel are trained to test human exposure to a limited number of toxic chemicals.
- Ten of these labs have “Level 1” status, where personnel are trained to test human exposure to a wide range of chemicals, including mustard agents, nerve agents, and other toxic chemicals.
- In an emergency, it is likely that in addition to the network of public health labs, other resources, such as Hazardous Material response teams (HAZMAT), Federal Bureau of Investigations (FBI), police, military, and private labs, would be used for surge capacity or special needs.

### Indicator 3: PUBLIC HEALTH LABORATORIES – WORKFORCE

**FINDING:** Only four states report that they do not have adequate numbers of lab scientists to manage tests for anthrax or the plague if there were to be a suspected outbreak.

46 states and D.C. report that they would have sufficient, trained laboratory scientists to manage tests for anthrax or the plague if there were to be a suspected outbreak (1 point)		4 states report that they would NOT have sufficient, trained laboratory scientists to manage tests for anthrax or the plague if there were to be a suspected outbreak (0 points)
Alabama	Nebraska	Iowa
Alaska	Nevada	Louisiana
Arizona	New Hampshire	Montana
Arkansas	New Jersey	North Dakota
California	New Mexico	
Colorado	New York*	
Connecticut	North Carolina	
Delaware	Ohio	
D.C.	Oklahoma	
Florida	Oregon	
Georgia	Pennsylvania	
Hawaii	Rhode Island	
Idaho	South Carolina	
Illinois	South Dakota	
Indiana	Tennessee	
Kansas	Texas	
Kentucky	Utah	
Maine	Vermont	
Maryland	Virginia	
Massachusetts	Washington	
Michigan	West Virginia	
Minnesota	Wisconsin	
Mississippi	Wyoming	
Missouri		

Source: APHL September–October 2006 survey.

\* New York did not respond to the survey, but indicated they had sufficient lab scientists to test for a potential outbreak of anthrax or the plague in the past. Puerto Rico reported that it did NOT have sufficient lab scientists.

Only 21 states reported having an adequate number of lab scientists to test for a potential anthrax or plague threat in 2004, and 41 states and D.C. reported having sufficient levels in 2005. So the current total number of 46 states and D. C. represents an improvement in the public health lab workforce’s capabilities for biological threats. But there is a caveat: the increase can largely be attributed to cross-training of the scientists rather

than to increases in the total number of staff in labs.<sup>30</sup>

Public health laboratories face critical staff shortages, along with the rest of the public health system. A wider-scale emergency requiring surge capacity in which labs would be inundated with large numbers of samples would compound and exacerbate the workforce shortage.

## Indicator 4: PUBLIC HEALTH LABORATORIES — SEASONAL FLU TESTING

**FINDING:** Four states do not test year round for the flu.

46 states and D.C. report they conduct year-round testing for flu (1 point)		4 states report they do NOT conduct year-round testing for flu (0 points)
Alabama	Montana	Iowa
Alaska	Nebraska	Louisiana
Arizona	Nevada	New Jersey
Arkansas	New Hampshire	Ohio
California	New Mexico	
Colorado	New York	
Connecticut	North Carolina	
Delaware	North Dakota	
D.C.	Oklahoma	
Florida	Oregon	
Georgia	Pennsylvania	
Hawaii	Rhode Island	
Idaho	South Carolina	
Illinois	South Dakota	
Indiana	Tennessee	
Kansas	Texas	
Kentucky	Utah	
Maine	Vermont	
Maryland	Virginia	
Massachusetts	Washington	
Michigan	West Virginia	
Minnesota	Wisconsin	
Mississippi	Wyoming	
Missouri		

Source: APHL September-October 2006 survey.

Note: Puerto Rico reported it did NOT test for flu year-round.

The federal pandemic flu preparedness guidance requires states to be capable of testing for influenza on a year-round basis, however, the pandemic flu preparedness funds were not expressly designated to increase lab capabilities.<sup>31</sup> Year-round testing is viewed as a critical component of monitoring for a potential pandemic outbreak.<sup>32</sup>

State-based epidemiologists are expected to report “influenza activity as no activity, sporadic, local, regional, or widespread” on a weekly basis to the CDC.<sup>33</sup> The guidance also suggests that the results of testing should be linked to an electronic reporting system (see Indicator 8) for more efficient tracking.

## Indicator 5: HOSPITAL BED SURGE CAPACITY AND PANDEMIC FLU

**FINDING:** Half of the states would run out of hospital beds within two weeks of a moderately severe pandemic flu outbreak.

25 states and D.C. have the surge capacity to meet the number of hospital beds that would be needed within two weeks of an outbreak of a moderately severe pandemic flu (1 point)		25 states do NOT have the surge capacity to meet the number of hospital beds that would be needed within two weeks of an outbreak of a moderately severe pandemic flu (0 points)	
State	Percent of bed capacity that would be reached within two weeks of a moderate flu pandemic*	State	Percent of bed capacity that would be reached within two weeks of a moderate flu pandemic*
Alabama	76%	Arizona	158%
Alaska	82%	California	149%
Arkansas	68%	Colorado	132%
D.C.	61%	Connecticut	197%
Georgia	99%	Delaware	219%
Idaho	85%	Florida	105%
Illinois	99%	Hawaii	143%
Indiana	76%	Maryland	181%
Iowa	68%	Massachusetts	160%
Kansas	59%	Michigan	109%
Kentucky	70%	Nevada	163%
Louisiana	63%	New Hampshire	118%
Maine	96%	New Jersey	151%
Minnesota	98%	New Mexico	120%
Mississippi	50%	New York	136%
Missouri	79%	North Carolina	119%
Montana	64%	Oregon	134%
Nebraska	56%	Pennsylvania	104%
North Dakota	45%	Rhode Island	184%
Ohio	90%	South Carolina	134%
Oklahoma	78%	Utah	105%
South Dakota	44%	Vermont	111%
Tennessee	72%	Virginia	134%
Texas	94%	Washington	137%
West Virginia	68%	Wisconsin	100%
Wyoming	52%		

\*Based on the CDC's FluSurge model program. Estimates rely on FluSurge 2.0 Beta Test Software, created by the CDC. More information about the model is available at <http://www.cdc.gov/flu/flusurge.htm>.

This scenario examines what would happen during a moderate pandemic outbreak. The severity for this type of outbreak is based on taking a halfway point between the 1968 and 1918 flu pandemics, with the 1968 pandemic considered relatively mild and the 1918 pandemic considered severe. The other factors in the FluSurge model are set to assumptions based on the 1968 pandemic. These default settings assume an outbreak would be 8 weeks in duration and 25 percent of the population would become ill. The data for the age demographics are from the Census Bureau's Current Population Survey, 2005, available at <http://dataferrett.census.gov/>. The bed statistics are based on the total number of licensed 2004 hospital beds (which is available through Kaiser Family Foundation's State Health Facts, available at <http://www.statehealthfacts.org/cgi-bin/healthfacts.cgi>), minus the typical hospital bed occupancy rates, (available for 2003 from CDC data and are available in the chart book, *Health, United States, 2005*) to determine the usual number of available bed capacity.

One of the most tangible and immediate impacts of an influenza pandemic would be on the health and healthcare delivery sectors. Patients would rapidly fill existing hospital beds and cause a surge in demand for critical medicines and equipment, such as antivirals, ventilators, and protective masks. It is estimated that there would be between one million and four million hospital admissions in minor pandemic and major pandemic scenarios, respectively.<sup>34</sup>

Beds are only one indicator of surge capacity. Others include adequately trained staff, supplies, and equipment. Currently, no measurement exists that assesses these in totality.

Under HHS guidelines and the DHS National Response Plan, “all hospitals are required to have a certain amount of ‘surge capacity,’” which is defined as the “ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care and public health in the event of bioterrorism or other large-scale public health emergencies or disasters.”<sup>35</sup> However, existing surge capacity would be quickly overwhelmed during a pandemic.

A pandemic outbreak is anticipated to last for at least eight weeks, peaking at five weeks. This measure shows how quickly states would reach their existing licensed bed capacity, with half of states exceeding this capacity within the first two weeks of an outbreak.

This scenario examines a moderate pandemic outbreak. Based on the FluSurge model, this

was based on the halfway point between the known severity of the 1968 and 1918 pandemic outbreaks. The 1968 pandemic was considered relatively mild, while the 1918 pandemic was considered severe. Under a moderate model, two million Americans would need to be hospitalized with pandemic-related illnesses, and 25 states would have shortfalls in the number of available licensed hospital beds within two weeks. These estimates do not take into account Army mobile hospitals or other emergency mobile hospital bed capacity. Few states have invested in this capacity on their own, or have only to a very limited degree.

North Dakota, South Dakota, and Minnesota would have the highest amount of available bed capacity within the two week time frame.<sup>36</sup> Delaware, Connecticut, and Rhode Island would have the highest overload rates.

- If there were to be a 1968-like mild outbreak, Delaware is the only state that would run out of hospital bed capacity within two weeks of an outbreak.
- If there were to be a 1918-like severe outbreak, 47 states and D.C. would run out of hospital bed capacity within two weeks. The three states that would still have capacity at the two-week point would be near capacity, with Mississippi filling 99 percent of its bed capacity, North Dakota at 90 percent capacity, and South Dakota at 88 percent capacity. (See Appendix F for more information on 1968- and 1918-based scenarios).

## SURGE CAPACITY

Among the major issues confronting the healthcare sector during an emergency situation is the question of surge capacity or the ability to rapidly mobilize to meet an increased demand.<sup>37</sup> HRSA’s critical benchmarks related to surge capacity include:

- Beds (including beds for trauma and burn care patients).
- Isolation capacity.
- Healthcare personnel/Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP).
- Pharmaceutical caches.
- Personal protective equipment (PPE) such as masks, respirators, gloves, and gowns.
- Decontamination.
- Behavioral (psychosocial) health considerations.
- Communications and information technology.<sup>38</sup>

### HRSA Guidance Requirements

HRSA guidance requires grantees to establish systems that, at a minimum, can provide triage treatment and initial stabilization above the current daily staffed bed capacity for the following classes of adult and pediatric patients requiring hospitalization within three hours of a terrorist incident or other public health emergency:

- 500 cases per million population for patients with symptoms of acute infectious disease, especially smallpox, anthrax, plague, tularemia, and influenza.
- 50 cases per million population for patients with symptoms of acute botulinum intoxication or other acute chemical poisoning, especially those cases resulting from nerve agent exposure.
- 50 cases per million population for patients suffering burn or trauma.
- 50 cases per million population for patients manifesting the symptoms of radiation-induced injury, especially bone marrow suppression.

HRSA has not released information about states' progress on a state-by-state basis. Also, the limited nature of these requirements would be insufficient for pandemic flu response.

For more on the HRSA guidance, see Section b: Strengthening Accountability in this report and the 2005 edition of *Ready or Not?*

### Potential Strategies for Increasing Hospital Surge Capacity

- Discharge patients early; establish discharge holding area.
- Convert outpatient procedure beds into inpatient beds.
- Use hallways or create alternate treatment areas (e.g., the cafeteria).
- Partner with local health department and emergency management agency to create emergency treatment capacity outside the hospital.
- Initiate mutual agreements with other healthcare facilities.
- Include acute, long-term care, and rehabilitation facilities.
- Implement communications systems to allow rapid dissemination of information to key players and planners in a mass-casualty event.<sup>39</sup>

—From a presentation by a HRSA official to the HHS Council on Public Health Preparedness, 2004.

Of course, these strategies do not address how to ensure there would be an adequate number of healthcare workers or other surge capacity requirements.

### MOBILE HOSPITALS

“Mobile hospitals are one solution to improve medical surge capacity. Health agencies in Connecticut, Nevada and other states have developed mobile hospital facilities that can be used for response to a variety of emergencies. North Carolina’s MED-I portable hospital deployed to Mississippi following Katrina along with the State Medical Assistance Team trailers filled with supplies. Set up in a Kmart parking lot, the 120 bed hospital was the only one operating in the county. More than 500 personnel from North Carolina provided care to nearly 7,500 patients during seven weeks following Katrina’s landfall. Funding from HRSA, CDC, and DHS helped the North Carolina Department of Health and Human Services purchase the hospital and supplies and hire staff to support it.”

— *Association of State and Territorial Health Officials States of Preparedness: Health Agency Progress 2006 report*<sup>40</sup>

## Indicator 6: SEASONAL FLU VACCINATION RATES FOR SENIORS

**FINDING:** Flu vaccination rates for seniors decreased in 13 states.

37 states and D.C. increased or maintained rates for vaccinating adults aged 65 and older for seasonal flu (comparing 2002-2004 to 2003-2005) (1 point)				13 states <b>DECREASED</b> rates for vaccinating adults aged 65 and older for seasonal flu (comparing 2002-2004 to 2003-2005) (0 points)			
State	2002-2004 rates	2003-2005 rates	Increased (statistically significant) or maintained (where decreases are noted, they are not considered statistically significant)	State	2002-2004 rates	2003-2005 rates	Decreased (statistically significant)
Alabama	67.11%	65.73%	-1.38%	Arizona	68.23%	65.86%	-2.37%
Alaska	66.60%	64.07%	-2.53%	California	71.65%	69.32%	-1.90%
Arkansas	68.59%	68.32%	-1.27%	Delaware	70.22%	68.31%	-1.91%
Colorado	75.43%	75.67%	0.24%	Illinois	62.94%	61.11%	-1.83%
Connecticut	72.96%	72.84%	-0.12%	Maine	73.59%	71.56%	-1.03%
D.C.	58.93%	57.62%	-1.31%	Maryland	66.30%	63.91%	-2.39%
Florida	62.75%	62.20%	-0.55%	Nevada	60.49%	57.60%	-2.89%
Georgia	63.70%	62.10%	0.40%	New Jersey	67.95%	66.07%	-1.88%
Hawaii	75.04%	74.13%	-0.91%	Pennsylvania	67.76%	63.97%	-3.79%
Idaho	67.24%	66.76%	-0.48%	Rhode Island	74.29%	72.14%	-2.15%
Indiana	65.62%	64.80%	-0.82%	South Carolina	68.23%	65.37%	-2.86%
Iowa	75.04%	74.44%	-0.60%	Tennessee	68.97%	65.50%	-3.47%
Kansas	69.20%	68.31%	-0.89%	Vermont	71.42%	69.01%	-2.41%
Kentucky	66.21%	65.18%	-1.03%				
<b>Louisiana*</b>	<b>64.73%</b>	<b>66.62%</b>	<b>1.89%</b>				
Massachusetts	70.70%	71.80%	-0.90%				
Michigan	67.38%	67.16%	-0.22%				
Minnesota	78.44%	78.92%	0.48%				
Mississippi	66.35%	65.78%	-0.57%				
Missouri	69.24%	66.96%	-2.28%				
Montana	70.95%	71.49%	0.54%				
<b>Nebraska*</b>	<b>72.63%</b>	<b>74.03%</b>	<b>1.40%</b>				
New Hampshire	72.33%	71.61%	-0.72%				
New Mexico	70.56%	70.88%	0.32%				
New York	66.18%	65.25%	-0.93%				
North Carolina	67.97%	67.07%	-0.90%				
North Dakota	73.74%	72.47%	-1.27%				
Ohio	67.40%	66.80%	-0.60%				
Oklahoma	74.45%	74.62%	0.17%				
Oregon	69.88%	70.14%	0.26%				
South Dakota	76.37%	77.04%	0.67%				
Texas	65.30%	65.45%	0.15%				
Utah	73.77%	73.19%	-0.58%				
Virginia	67.88%	68.34%	0.46%				
Washington	68.86%	69.71%	0.85%				
West Virginia	67.60%	66.85%	-0.75%				
Wisconsin	73.46%	72.72%	-0.74%				
Wyoming	72.38%	73.09%	0.71%				

Source: BRFSS. Data include three year comparisons.

\* Louisiana and Nebraska were the only two states with statistically significant increases in vaccination rates.

Note that each state has a different sample size so the rates of increase and decrease are not comparable across states – each state has a different range to reach statistically significant changes.

Vaccines are often cited as one of the top public health accomplishments of the 20th century.<sup>41</sup> Immunizations have helped prevent countless illnesses and deaths, and are extremely cost-effective, sparing the health-care system the costs of caring for those who might otherwise become ill.

According to the CDC, five to 20 percent of Americans contract the seasonal flu, more than 200,000 people are hospitalized from flu complications, and approximately 36,000 people die from the flu each year.<sup>42</sup>

People in certain at-risk groups are more vulnerable to complications from the seasonal flu, including children six months to five years old and individuals with “chronic health problems, including asthma, and other problems of the lungs, immune suppression, chronic kidney disease, heart disease, HIV/AIDS, diabetes, sickle cell anemia or long-term aspirin therapy and/or any other condition that can compromise respiratory function,” and adults 65 years and older.<sup>43</sup> The CDC recommends that these high-risk populations and their caretakers receive a vaccine at the beginning of the flu season.

The data for this indicator are from the CDC’s Behavioral Risk Factor Surveillance System (BRFSS), an annual cross-sectional telephone survey of more than 350,000 adults over 18 years old and older (averaging more than 4,000 interviews by state) conducted by the health departments of all states and D.C. BRFSS is the primary source of health information for states. According to the CDC, it is the largest telephone survey in the world and generates confidence intervals of less than plus or minus three percent.<sup>44</sup>

The CDC provides information from BRFSS to policymakers, including Congress and state officials, and to the public. BRFSS data are then used to inform decisions about health policies, funding, and activities.

TFAH contracted with Daniel Eisenberg, Ph.D., Assistant Professor, and Edward N. Okeke, MBBS, Health Service Organization and Policy Doctoral Student, at the Department of Health Management and Policy of the University of Michigan School of Public Health to analyze the BRFSS data on flu vaccination rates for adults aged 65 and over comparing vaccination rates for the period of 2002, 2003, and 2004 to the period of 2003, 2004, and 2005. These three-year periods are compared instead of single year-to-year changes since there are annual variations in the data. Based on advice received from CDC policy officials, TFAH “stabilizes” the data by combining three years, allowing for comparisons over time. A standard threshold of statistical significance of five percent was used to determine increases or decreases in vaccination rates. (For more information on the methodology, see Appendix D.)

Vaccination rates for seniors only increased in two states (Louisiana and Nebraska), but they were statistically maintained in 35 additional states. States with increases or maintained rates received a point for this indicator. Flu vaccination rates for seniors decreased in 13 states. Minnesota (78.92 percent) and Colorado (75.67 percent) had the highest vaccination rates for the 2003-2005 period. Nevada (57.60 percent) and D.C. (57.62 percent) had the lowest vaccination rates for the period.

## POSSIBLE IMPACT OF 2004 FLU VACCINE SHORTAGE

In 2004, there was a nationwide shortage of flu vaccine, which may have impacted vaccination rates that year. The 2004 rates are included in both three-year comparisons for this indicator. Even though it is recommended to combine three years of data in order to make comparisons, in order to gauge how the shortage may have impacted vaccination rates, TFAH examined the year-to-year totals. Comparing 2003 to 2004 rates, 10 states still increased their vaccination rates despite the shortage, and an additional 12 states maintained their vaccination rates within a one percentage point drop; six states were within two percentage points; eight states were within three percentage points; four states were within four percentage points. The biggest drops were Vermont, with a 7.5 percent decline and Washington, D.C. with an 8.1 percent decline. From 2004 to 2005, when there was no shortage, only one state (Michigan) increased its vaccination rate. (For more information, see Appendix D).

In 2005, just under two-thirds (65.7 percent) of Americans aged 65 and over had a flu shot compared to 68.0 percent in 2004, the year of the vaccine shortage, and 70.3 percent in 2003.<sup>45</sup> Also during the year of the major shortage in the 2004-2005 season, “especially virulent strains were in circulation,” and only 35.7 percent of “health care workers who had contact with patients” received their shots.<sup>46</sup>

Seasonal flu vaccinations are viewed as a key part of planning for pandemic preparedness and other emergency responses that would require mass vaccination or distribution of medications.<sup>47</sup>

- 1. Getting vaccinated for seasonal flu helps people prepare for emergency vaccinations.** When people get accustomed to receiving vaccines regularly, they become more prepared for what to expect during emergencies, helping to curb levels of chaos during times when it will be critical to vaccinate the population quickly. Improving seasonal vaccination rates also protects members of the public from getting needlessly sick and spreading the disease to others.

- 2. Seasonal vaccination drills help prepare the health system to rapidly distribute and administer vaccines.** Practicing mass vaccinations gives communities “the opportunity to practice the rapid dissemination of important infection control information, such as the necessity of annual vaccination, hand hygiene, respiratory etiquette, and other personal protective actions.”<sup>48</sup>
- 3. Improving seasonal vaccination rates encourages the private sector to invest in the vaccine industry.** Creating an ongoing demand for flu vaccine will encourage more investment in the infrastructure needed to develop a pandemic flu vaccine and to produce it in larger numbers.

## EXAMPLES OF SEASONAL FLU VACCINATIONS TO BOLSTER PANDEMIC PREPAREDNESS

- **Billings, Montana** held a drill in fall 2006 to determine how quickly residents could be vaccinated in the event of an emergency. Officials found, on average, “time from entrance to exit was nine minutes,” and by the day’s end (12 hours), “6,347 people had been inoculated, an average of 529 people an hour.”<sup>49</sup>
- The **New York State Department of Health** held a drill called “ProtEX NY” in November of 2005 in which it vaccinated 1,862 people in four hours.<sup>50</sup> In a follow-up survey, all of the nurses who participated in the drill “felt competent to respond to a public health emergency.”<sup>51</sup>
- **Belmont, Massachusetts** held a flu vaccination drill, rather than a more traditional clinic, in the fall of 2006 in order to get “residents accustomed to the Belmont Hill School facility that has been designated as one of the emergency dispensing sites in the [t]own.”<sup>52</sup>

## Indicator 7: PNEUMONIA VACCINATION RATES FOR SENIORS

**FINDING:** In 2005, half of the states have achieved a 65.7 percent pneumococcal vaccination rate for adults aged 65 and older. This is nearly 25 percentage points away from the national goal of achieving vaccination rates of 90 percent by 2010.

26 states are at or above the national median (65.7 percent) for the number of adults aged 65 and older who have ever received a pneumococcal vaccination (1 point)	24 states and D.C. have NOT reached the national median (65.7 percent) for the number of adults aged 65 and older who have ever received a pneumococcal vaccination (0 points)
Colorado (70.2%) Connecticut (69.3%) Delaware (65.9%) Hawaii (65.9%) Iowa (69.1%) Kansas (66.8%) Louisiana (71.4%) Michigan (66.2%) Minnesota (71.1%) Montana (69.9%) Nebraska (67.9%) Nevada (69.8%) New Hampshire (69.8%) North Carolina (66.2%) North Dakota (71.7%) Oklahoma (71.1%) Oregon (71.4%) Pennsylvania (67.2%) Rhode Island (71.5%) South Dakota (66.3%) Utah (66.4%) Vermont (66.7%) Virginia (66.5%) Washington (66.9%) West Virginia (68.2%) Wyoming (71.2%)	Alabama (61.9%) Alaska (61.1%) Arizona (65.4%) Arkansas (57.4%) California (61.3%) D.C. (51.6%) Florida (62.4%) Georgia (62.5%) Idaho (61.6%) Illinois (57.0%) Indiana (65.3%) Kentucky (62.9%) Maine (64.4%) Maryland (62.0%) Massachusetts (64.8%) Mississippi (65.7%) Missouri (64.8%) New Jersey (64.0%) New Mexico (64.7%) New York (62.0%) Ohio (61.5%) South Carolina (65.6%) Tennessee (63.8%) Texas (62.2%) Wisconsin (65.7%)

Source: BRFSS

Note: Rates for Puerto Rico and the Virgin Islands are 28.3 percent and 29.1 percent, respectively.

HHS has set a national goal of immunizing 90 percent of adults aged 65 and older against pneumococcal disease by the year 2010.<sup>53, 54</sup> The CDC also recommends that children over two years of age who have a long-term health problem (e.g., heart disease, lung disease, sickle cell disease, diabetes, alcoholism, cirrhosis, leaks of cerebrospinal fluid, etc.), who have a disease or condition that lowers the body's resistance to infection (e.g., Hodgkin's, leukemia, HIV, etc.), or who are taking any drug or treatment that lowers the body's resistance to infection (e.g., long term steroids, radiation

therapy, etc.) should get the pneumococcal polysaccharide vaccine (PPV).<sup>55</sup> This shot is only required one time, and is not required on an annual basis like the flu vaccine.

PPV protects against 23 types of pneumococcal bacteria, which can attack different parts of the body, such as the brain (meningitis), the lungs (pneumonia), and the blood (bacteraemia).<sup>56</sup> According to the CDC, approximately "[one] out of every 20 people who get pneumococcal pneumonia dies from it, as do about [two] people out of 10 who get bacteraemia, and three people out of 10 who get meningitis."<sup>57</sup>

People with the flu, particularly seniors, are at risk for developing pneumonia as a complication. Pneumonia can be lethal, particularly in older adults. Together with influenza, pneumonia is currently the eighth leading cause of death in the United States. In 2004, 60,207 people died from pneumonia. There were over one million hospitalizations associated with pneumonia, with individuals 65 and over accounting for 60 percent (800,000) of these cases.<sup>58, 59</sup>

States that have met the cumulative median rate of 65.7 percent for vaccinating seniors for pneumonia received 1 point for this indicator, since states have four more years to meet the HHS national goal. The data are from the CDC's 2005 BRFSS, which looks at the cumulative rates for vaccinating adults 65 and over in each state.<sup>60</sup> (See Indicator 6 and Appendix D for more on the BRFSS).

## Indicator 8: DISEASE TRACKING

**FINDING:** Twelve states and D.C. do not have an electronic disease surveillance system that includes an integrated data, electronic lab reporting, and Internet-browser system that is compatible with CDC's system.

38 states have electronic disease tracking systems that are compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (1 point)		12 states and D.C. do NOT have electronic disease tracking systems that are compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (0 points)
Alabama	Nevada	Alaska
Arizona	New Hampshire	Arkansas
Colorado	New Jersey	California
Delaware	New Mexico	Connecticut
Florida	New York	D.C.
Georgia	North Dakota	Indiana
Hawaii	Ohio	Iowa
Idaho	Oklahoma	Minnesota
Illinois	Oregon	Mississippi
Kansas	Pennsylvania	North Carolina
Kentucky	Rhode Island	Utah
Louisiana	South Carolina	West Virginia
Maine	South Dakota	Wisconsin
Maryland	Tennessee	
Massachusetts	Texas	
Michigan	Vermont	
Missouri	Virginia	
Montana	Washington	
Nebraska	Wyoming	

Source: CDC

The National Electronic Disease Surveillance System (NEDSS) was developed to integrate and standardize the tracking of infectious disease. It promotes standards-based, electronic reporting for more rapid, accurate, and integrated information. It is one component of an overarching Public Health Information Network (PHIN) at CDC. The system includes four components:

- Disease data entry directly on the Web through an Internet browser-based system, creating a database accessible by health investigators and public health professionals;
- Electronic Laboratory Results (ELR) reporting, which allows labs to report information about communicable diseases to health departments;

- Integration of multiple health information databases creating a single repository; and
- Electronic messaging capabilities, allowing states to share information efficiently with CDC and other health agencies.

According to the CDC's definition, to be considered NEDSS-compatible, states must have systems that meet requirements for 1) an Internet browser-based system; 2) Electronic Laboratory Results (ELR) reporting; and 3) an integrated data repository. An upgrade to the messaging component is under development system-wide, and is, therefore, not included as part of the criteria.

Thirty-eight states have met the requirements for NEDSS-compatibility, based on CDC standards. A number of states plan to be NEDSS-compatible in 2007, including Arkansas, Iowa, Mississippi, North Carolina, Wisconsin, and West Virginia.

The number of NEDSS-compatible states has increased from 18 in 2004 to 27 in 2005 to 36 in 2006.

Delivering effective public health services depends on timely and reliable information.

Health departments cannot protect people from existing or emerging health threats, such as a new disease outbreak or bioterror attack, without the right information. The lack of timely and comprehensive data can cause delays in identifying and responding to serious and mass emergency health problems. Additionally, federal, state, and local health departments and private healthcare providers must all work together to effectively track information about and respond to health threats.

While the CDC preparedness guidance does not require NEDSS compatibility, NEDSS provides a basis for national consistency and compatibility and is the predominant system that the CDC uses. It is currently one of the few data points about state preparedness activities that is collected and made publicly available by the CDC. A number of states that are not currently compatible with NEDSS have requested the resources they would need to accomplish this, but have not received them. The current trend toward increased use of electronic health records (EHR) raises new issues for health tracking, including questions about how to modernize systems to take advantage of the most recent technologies.

### NEED TO MODERNIZE DISEASE TRACKING TECHNIQUES

Before 2000, "state health departments received most case-report forms by mail and then entered the data into computer systems, sometimes weeks after the cases of notifiable disease had occurred, including cases that warranted immediate public health investigation or intervention. In addition, depending on the disease, only 10 percent to 85 percent of [disease] cases were reported, and more than 100 different systems were used to transmit these reports from the states to [the] CDC."<sup>61</sup>

#### Electronic Health Records: A Future Tool for Public Health?

Public health concerns need to be a central part of discussions about how electronic health records (EHRs) can modernize aspects of the healthcare industry. Strategic decisions about integration and interoperability could benefit public health research and could help vastly improve the nation's ability to strategically investigate health problems ranging from chronic diseases to bioterrorism, identify factors contributing to diseases, and develop ways to better control or cure illnesses.

## Indicator 9: REGISTERED NURSES – WORKFORCE SHORTAGE

**FINDING:** 80 percent of the states have a shortage of registered nurses.

10 states do not have a nursing workforce shortage [as of 2005] (1 point)	40 states and D.C. have a nursing workforce SHORTAGE [as of 2005] (0 points)
Idaho (0)* Kansas (+100) Kentucky (+1,100) Michigan (+1,100) Montana (+200) Oklahoma (+600) South Dakota (+100) Vermont (0) West Virginia (+1,000) Wisconsin (+3,100)	Alabama (-200)* Alaska (-1,100) Arizona (-8,600) Arkansas (-2,100) California (-22,500) Colorado (-5,700) Connecticut (-6,400) D.C. (-2,000) Delaware (-700) Florida (-18,200) Georgia (-8,900) Hawaii (-3,400) Iowa (-2,300) Illinois (-1,600) Indiana (-4,800) Louisiana (-100) Maine (-1,500) Maryland (-2,900) Massachusetts (-9,000) Minnesota (-1,600) Mississippi (-500) Missouri (-9,300) Nebraska (-1,800) New Hampshire (-2,000) New Jersey (-11,500) New Mexico (-2,000) New York (-13,400) Nevada (-2,800) North Carolina (-3,900) North Dakota (-500) Ohio (-6,400) Oregon (-2,200) Pennsylvania (-9,100) Rhode Island (-2,100) South Carolina (-3,200) Tennessee (-13,100) Texas (-28,500) Utah (-900) Virginia (-6,000) Washington (-2,700) Wyoming (-700)

Source: National Center for Health Workforce Analysis, Bureau of Health Professions, HRSA

\*The figures in parentheses represent the number above or below the needed number of registered nurses in that state.

Nurses are one of many sets of priority providers who are needed during health emergencies.

A study by the National Center for Health Workforce Analysis (NCHWA) in the Bureau of Health Professions of HRSA found that there is a shortage of registered nurses. If current trends continue, NCHWA estimates the national nursing shortage will reach more than one million full-time RNs by 2020.<sup>62</sup> (For more on the methodology of the NCHWA study, see Appendix E.) Forty states and D.C. were found to have nursing shortages and did not receive a point for this indicator.

The nursing shortage makes it challenging for the healthcare sector to meet current service needs. This problem would be compounded during emergencies, when there would be an influx of additional patients. If healthcare staff levels are insufficient on a day-to-day basis, they will be exponentially overtaxed during a mass emergency.

According to two recent studies, the shortage of public health nurses is even more extreme than for registered nurses overall.<sup>63</sup> According to the Quad Council of Public Health Nursing Organizations:

“The current shortage is complex, the result of multiple and varied factors. Contributing factors include an overall shortage of registered nurses as well as factors specific to public health: an aging population of nurses; a poorly funded public health system on the national, state and local levels that results in inadequate salaries; reduced and/or eliminated public health nursing positions; bureaucratic hiring practices; inadequate numbers of baccalaureate nursing graduates; limited public health advocacy; a growing shortage of nursing faculty, adequately prepared to teach public health nursing; and invisibility of public health nursing in media and marketing campaigns.”<sup>64</sup>

### Nursing Shortage Growth from 2000-2005

	Total supply	Total demand	Shortfall (supply minus demand)
2000	1,890,700	2,001,500	-110,800
2005	1,942,500	2,161,399	-218,899

### NURSING WORKFORCE AND SURGE CAPACITY

Following Hurricanes Katrina and Rita in 2005, nurses from around the nation traveled to the Gulf Coast region to provide medical care to hurricane victims. For example:

- The California Nurses Association (CNA) sent more than 300 nurses to 25 hospitals, clinics, and mobile units in Louisiana, Texas, and Mississippi and “provided half of the RN staff at the Earl K. Long Memorial Hospital in Baton Rouge, Louisiana, for two months after Katrina, when patient rolls doubled overnight.”<sup>65, 66</sup>
- The Texas Nurses Association (TNA) provided disaster relief to storm victims through Ready Texas Nurses, an initiative which TNA created with the Texas Nurses Foundation (TNF) after 9/11. Through Ready Texas Nurses, TNA and TNF “were able to call up some 1,200 credentialed nurses and process more than 1,000 nurses who wanted to volunteer.”<sup>67</sup>

Not all public health emergencies are contained within a specific area of the country, as was the case with Hurricanes Katrina and Rita. Emergencies like pandemic flu or other major disease outbreaks can impact the entire nation. It is therefore crucial that all areas of the country have an adequate supply of RNs to meet local patient demand in times of a public health crisis.

## IMMINENT PUBLIC HEALTH WORKFORCE BRAIN DRAIN

In nearly half of the states, 25 percent or more of the state public health workforce will be eligible for retirement within the next five years, according to a 2003 survey conducted by the Association of State and Territorial Health Officials (ASTHO) and the Council of State Governments (CSG). Eight states face potential retiree levels of 40 percent or higher.<sup>68</sup> This will likely lead to severe staffing shortages. Baby boomers are retiring and the recruitment of the next generation of public health professionals is falling short of the need. The ASTHO/CSG survey has not been updated, and, therefore, was not used as an indicator in this *Ready or Not?* report. ASTHO is planning to update the survey in 2007.

According to a recent article in *Health Affairs*, “there is not a robust pipeline of trained personnel to work in public health agencies, and salaries for public health nurses, epidemiologists, laboratory professionals, and physicians are often not competitive with those of their private-sector counterparts.”<sup>69</sup>

In 2004 and 2005, U.S. Senators Charles Hagel (R-NE) and Richard Durbin (D-IL) introduced “The Public Health Workforce Act” to help address the workforce crisis, but no action was taken.

## SURGE WORKFORCE FOR EMERGENCIES?

The Surgeon General’s Office and HRSA have been working to establish strong volunteer networks of medical professionals to help with emergencies. Both efforts are in early stages of development.

The Surgeon General’s Office manages the **Medical Reserve Corps (MRC)** as part of a national network of volunteers called the Citizen Corps to help with expert medical care surge capacity during times of emergency.<sup>70</sup> The mission of the MRC “is to establish teams of local volunteer medical and public health professionals who can contribute their skills and expertise throughout the year and during times of need.”<sup>71</sup> It is comprised of community-based units that include physicians, nurses, pharmacists, dentists, veterinarians, and epidemiologists, and it also has a wealth of support staff positions such as interpreters, chaplains, and legal advisors.<sup>72</sup> Across the country there are 499 units of the MRC as of November 2006.<sup>73</sup>

The units are funded by the federal government, as well as state and local governments, and in some cases through private funds, such as foundations. The MRC has recently entered into a cooperative agreement with the National Association of County and City Health Officials (NACCHO) in an attempt to strengthen the relationship between the Corps and state and local health departments.<sup>74</sup>

Additionally, HRSA manages a state-based program designed to secure a volunteer healthcare delivery workforce in the event of an emergency.<sup>75</sup> **The National Emergency Systems for Advance Registration of Volunteer Health Professionals (ESAR-VHP)** program helps states develop standardized programs for registering volunteer health professionals in advance of emergencies. Each state program collects verified information on the identity, licensure status, clinical privileges, and professional credentials of volunteers. State ESAR-VHP systems are intended to serve as the mechanism for recording the registration and credential information of all potential health volunteers in a state. They will provide a single, centralized volunteer information database to facilitate intra-state, state-to-state, and state-to-federal transfer of volunteers. These systems should include information about volunteers involved in organized volunteer efforts at the local level (such as **MRC units**) and the state level. The systems will also serve a critical statewide role recruiting, registering, verifying credentials, and classifying health professionals who are willing to serve in emergencies, but are not interested in being part of a trained, organized volunteer structure. HRSA is actively working with states to accelerate implementation and operation of these state systems.

## COMPLICATIONS WITH A VOLUNTARY SURGE WORKFORCE: MEDICAL WORKERS' EXPERIENCE IN HURRICANE KATRINA RELIEF EFFORTS

According to a report in *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, many medical professionals who tried to volunteer during the Hurricane Katrina relief effort encountered complications in the credentialing system, which ultimately led many of them to abandon attempts to help or forced them to go outside the system, forming ad hoc medical teams.<sup>76</sup> According to the report, "HHS launched its own website for medical and support volunteers both to rally volunteer support and to verify professional credentialing. However, many MRC volunteers were already registered and credentialed through the HRSA Emergency System for Advanced Registration of Volunteer Health Professionals (ESAR-VHP) program. Because HHS was operating more than one credentialing system, it was unclear to some MRC volunteers which system they were supposed to use."<sup>77</sup>

## Indicator 10: STATE PUBLIC HEALTH BUDGETS

**FINDING:** Six states cut funding for public health from FY 2004-05 to FY 2005-06.

44 states and D.C. increased or maintained level funding for public health services from FY 2004-05 to FY 2005-06 (1 point)	6 states DECREASED funding for public health services from FY 2004-05 to FY 2005-06 (0 points)
State and percent increase	State and percent decrease
Alabama (6.4%) Alaska <sup>2</sup> (11.7%) Arizona (8.4%) California (1.3%) Colorado (18.4%) Connecticut <sup>2</sup> (4.1%) Delaware <sup>2</sup> (6.5%) D.C. <sup>2</sup> (25.7%) Florida (4.8%) Georgia (14.0%) Hawaii <sup>2</sup> (10.1%) Idaho (4.6%) Illinois (2.5%) Indiana (7.6%) Iowa <sup>2</sup> (4.9%) Kansas (14.2%) Kentucky (8.6%) Louisiana <sup>3</sup> (1.8%) Maryland <sup>2</sup> (0.9%) Massachusetts <sup>4</sup> (9.4%) Minnesota <sup>4</sup> (7.2%) Missouri <sup>5</sup> (0.2%) Montana (57.7%)	Arkansas (-1.8%) Maine <sup>2,4</sup> (-6.9%) Michigan <sup>4</sup> (-3.6%) Mississippi <sup>2,4</sup> (-7.2%) Pennsylvania <sup>6</sup> (-4.2%) South Dakota (-2.3%)
Nebraska <sup>4</sup> (10.3%) Nevada <sup>2,4</sup> (2.6%) New Hampshire (3.4%) New Jersey (9.2%) New Mexico (8.2%) New York (3.7%) North Carolina <sup>2</sup> (2.8%) <b>North Dakota<sup>2,4</sup> (1.8%)</b> Ohio <sup>4</sup> (15.2%) Oklahoma <sup>1</sup> (18.2%) <b>Oregon (22.0%)</b> Rhode Island (11.8%) South Carolina* (0.0%) Tennessee (21.8%) Texas (21.7%) Utah (6.4%) Vermont <sup>3</sup> (5.2%) <b>Virginia<sup>3,4</sup> (5.9%)</b> <b>Washington<sup>4</sup> (12.5%)</b> West Virginia (5.4%) Wisconsin <sup>4</sup> (4.7%) <b>Wyoming (17.8%)</b>	

Source: Research by TFAH of publicly available state budget documents and interviews with health and budget officials in the states.

### NOTES:

\*South Carolina's budget remained the same.

Biennium budgets are bolded.

<sup>1</sup> May contain some social service programs, but not Medicaid or CHIP.

<sup>2</sup> General funds only.

<sup>3</sup> Includes mental health, and/or developmental disabilities, and/or addiction treatment in funding to local health departments.

<sup>4</sup> Budget data taken from appropriations legislation.

<sup>5</sup> Missouri's percent change based on FY 2004-05 and FY 2005-06 actual expenditures.

<sup>6</sup> Pennsylvania's decrease in funding from FY 2004-05 to FY 2005-06 is due to a decrease in appropriations funded through Tobacco Settlement Funds and the redirection of funds from tobacco prevention and cessation programs to long-term care services for seniors and persons with disabilities. According to the State of Pennsylvania, if Tobacco Settlement Funds were excluded from the calculation, the result would be an increase in funding of \$1,042,000 or .4% from FY 2004-05 to FY 2005-06.

Every state allocates and reports its budget in different ways. States also vary widely in the level of specific detail they provide. This makes comparisons across states difficult. For this analysis, TFAH examined state budgets and appropriations bills for the agency, department, or division in charge of public health services for FY 2004-05 to FY 2005-06, using a definition that is as consistent as possible across the two years, based on how each state reports data. TFAH defined “public health services” broadly, including most state-level health funding. Based on this analysis, six states experienced cuts in their public health budgets. (For additional information on the methodology of the budget analysis, please see Appendix C).

Several states that received points for this indicator may not have actually increased their spending on public health programs. The way

some states report their budgets, for instance by including federal funding in the totals or including public health dollars within health-care spending totals, makes it difficult to determine “public health” as a separate item.

Few states allocate funds directly for bioterrorism and public health preparedness as part of their public health budget. Instead, most rely on federal funds to support these activities. However, the infrastructure of other public health programs also supports their underlying preparedness capabilities.

While this indicator examines whether state budgets increased or decreased, it does not assess if the funding is adequate to cover public health needs in the states. This also does not take into account ongoing hospital needs and funding.



## PUBLIC HEALTH IS UNDERFUNDED; LACKS CONSISTENCY AND TRANSPARENCY

Financial support for public health programs comes from a combination of federal, state, and local funds; the majority of funding comes from state and local governments. In 2000, state and local spending was 2.5 times the federal level, accounting for 70 percent of public health spending.<sup>78</sup> According to an analysis in *Health Affairs*, the federal bioterrorism funding provided by Congress in FY 2002 and FY 2003 represented a 25 percent increase in the federal contribution to public health spending, which is expected to *marginally raise the total federal share of funding from 29 to 34 percent*.<sup>79</sup> More than 95 percent of the new federal funds for public health preparedness are devoted to systems that were already broken and antiquated.

Despite flat or increased funding in most states during the most recent budget cycle, the funding falls far short of the estimated levels needed to reach an acceptable level of preparedness, according to most public health experts. For instance, the Public Health Foundation estimates an additional \$10 billion is needed to reach the minimum preparedness requirements.<sup>80</sup>

States do not report their public health budgets in consistent ways, and in many cases, there is little definition on a line basis for what the funds are used for. It is difficult to compare funding across states and to determine which public health needs are adequately funded or not within each state. Additionally, in some cases, the public health budget is not reported on separately from the total healthcare spending budget in the state.

TFAH's 2006 report, *Shortchanging America's Health: A State-By-State Look at How Federal Public Health Dollars Are Spent*, estimated that it would take an additional investment of about \$2.6 billion to bring public health spending to a level that would address disparities across the states, bringing states that spend below the national average up to the average.

The median state spending on public health is currently only \$31 per person per year. In comparison, median state spending is \$689.93 per person annually for K-12 education; \$215.34 for higher education; and \$96.18 for corrections.<sup>81</sup>

The IOM has urged HHS to collect information about public health budgets and programs at the state, local, and federal levels to better assess the nation's ability to provide critical public health services to every community.<sup>82</sup>

**TFAH recommends that all levels of government provide full, more consistent, and transparent information to the public about the funding of health programs and services.**

“New (federal BT [bioterrorism]) funds, however, along with the publicity around terrorist threats and their prevention, have ‘raised expectations about preparedness and our ability to respond by the programs and initiatives we’ve put in place,’ said one local health official. Public health leaders ... voiced concern about their ability to meet these expectations over time, given questions about the sustainability of federal funding.”<sup>83</sup>

— FINDINGS FROM THE COMMUNITY TRACKING SURVEY, *HEALTH AFFAIRS*, JULY/AUGUST 2006



# Strengthening Funding and Accountability

“When public health works best, it is invisible – it’s the disease you didn’t get, the accident you didn’t have, the disaster that didn’t happen” is an adage within the public health community.<sup>84</sup> After September 11 and the anthrax attacks, it became clear that the nation’s public health system was antiquated, unprepared, and under-funded to respond to modern health threats.<sup>85</sup> Public health practitioners have not always been considered “front line” responders, but with increased threats of bioterrorism and pandemic flu, they have been recognized as a central component in emergency threat response.

There are few existing structures or historical examples to build upon. Much of bioterrorism and public health preparedness has necessitated creating systems, technologies, and measures from scratch. To help meet this need, in 2002, Congress passed the Public Health Security and Bioterrorism Act, appropriating approximately \$1 billion per year to help bolster federal and state preparedness.

In 2006, Congress has considered reauthorization of the bill, currently called the Pandemic and All-Hazards Act. As of early December, the bill had not been enacted. Reauthorization of this legislation provides an opportunity to address ongoing preparedness concerns.

## I. Strengthening Preparedness Funds

After the initial rounds of funds to support public health preparedness, the programs have already experienced cuts, even before many basic preparedness goals could be met. These cuts threaten to halt or even reverse progress that has been achieved.

Since FY 2004, over \$90 million has been cut from CDC preparedness funds allocated to states, and over \$23 million has been cut from HRSA funds allocated to states for hospital preparedness. Additionally, some funds originally designated for state preparedness have been “reprogrammed” to other bioter-

rorism activities, including \$27 million in FY 2004 and \$52 million in FY 2005 shifted to the Cities Readiness Initiative (CRI).

All of these reprogrammed funds are important for preparedness, but funding for new programs should not come at the expense of vital ongoing preparedness activities. Taking funds away from existing state and local preparedness efforts jeopardizes the progress that has been made. (For more information on CDC and HRSA guidance on the use of preparedness funds, see Appendix B.)

<b>Federal Bioterrorism Preparedness Funding, Post-September 11, 2001*</b>				
<b>Fiscal Year</b>	<b>Centers for Disease Control and Prevention (CDC)</b>	<b>Health Resources and Services Administration (HRSA)</b>	<b>Total</b>	<b>Difference from last FY</b>
FY 2002	\$918,000,000	\$124,500,000	\$1,039,500,000	NA
FY 2003	\$870,000,000	\$498,000,000	\$1,368,000,000	+ \$328,500,000
FY 2004	\$849,596,000**	\$498,000,000	\$1,347,596,000	- \$20,404,000
FY 2005	\$862,777,000**	\$470,755,000	\$1,333,532,000	- \$14,064,000
FY 2006	\$823,099,000	\$460,216,752	\$1,283,315,752	- \$50,216,248

\*Prior to September 11, funding for bioterrorism preparedness was \$67 million in FY 2001.

\*\* This includes \$27 million in FY 2004 and \$52 million in FY 2005 “reprogrammed” from state funds and channeled to the Cities Readiness Initiative (CRI).

## 2. Strengthening Accountability

Another public health adage is that “preparedness is a process.” While that is clearly true, and it is impossible to be 100 percent prepared for every possibility, there are basic protections that should be in place in every state and community across the country. Americans rely on their government to protect them from threats that are bigger than any individual or single community can respond to on their own. Other sectors involved in emergency response on a day-to-day basis, including law enforcement, public safety, firefighters, Emergency Medical Services (EMS), hospitals, and the military, have determined “optimally achievable” measures for preparedness.<sup>86</sup> The public health preparedness system does not currently have a comparable set of baseline objectives.

Five years after September 11, there is still little information publicly available to evaluate how states’ preparedness capabilities have improved and what vulnerabilities remain. The lack of concrete data has raised concerns among Members of Congress, the GAO, and HHS, as well as independent analysts and watchdog groups. This means Americans do not have information about how well their communities and states are prepared, and do not know whether their tax dollars are being spent efficiently. It also makes it difficult for

Congress to know where it should strategically invest limited federal funds to address vulnerabilities and to hold states accountable for their use of these funds.

The CDC and HRSA have gone through a number of iterations toward establishing clear, objective “performance measures” for states. Each year, they have been updated to reflect more of an emphasis on demonstrating capabilities versus developing plans. However, the most recent measures are still viewed as inadequate and have received criticism for focusing on:

- Self-reported information from states that cannot be verified objectively or by external evaluators;
- Releasing data only in aggregate form, rather than on a state-by-state basis, which denies the public and policymakers information about how prepared their communities are and how well the funds are being used;
- Process versus outcomes, such as evaluating time frames for activities rather than the quality and impact of the information; and
- Basic capabilities instead of how a state would be able to cope with a mass emergency when the regular functions would be quickly overwhelmed.

Useful performance standards must include:

- Baseline, “optimally achievable” standards that every jurisdiction should be required to meet;
- Externally or objectively verifiable achievements;
- An emphasis on meeting mass emergency surge needs; and
- Public reporting of the information to citizens and policymakers in every state.

### EXAMPLE OF REAL WORLD OUTCOMES VERSUS PROCESS

Questions remain about whether the performance measures capture an accurate reflection of the capabilities that would be needed to respond to real world events.

For instance, the measures for lab capabilities generally perform well on the CDC’s FY 2006 criteria: whether labs pass proficiency tests, time for shipment of clinical biological specimens, time from presumptive identification to confirmatory identification of select agents, time it takes reference laboratorians to respond to a call during non-business hours, and time it takes a reference lab to generate confirmatory results for an agent of urgent public health consequence to notification of appropriate officials.<sup>87</sup>

However, a November 2006 investigation by the Scripps Howard News Service found that in 2004, labs listed the causes of nearly two-thirds of 6,374 food-related disease outbreaks as “unknown.”<sup>88</sup> It is unclear if the current performance measures are too selective to capture these types of performance issues, which would be further amplified during a major public health crisis.

### POST 9/11 CHALLENGES OF DEFINING AND IMPLEMENTING PERFORMANCE MEASURES

An August 2006 report by the National Network of Public Health Institutes, Illinois Public Health Institute, Kansas Health Institute, and Michigan Public Health Institute outlines the challenges that an “absence of performance standards” has created for states and localities receiving preparedness funds. The report further notes that the states have “received little guidance on how to set goals for their programs and how to monitor their progress.”<sup>89</sup>

The report concludes that the use of a “structured assessment instrument combined with a structured scoring system [is] very helpful. The use of standardized tools and scoring methods allows for the comparison of results across jurisdictions or for the same jurisdiction at multiple points in time, as well as comparisons of results against benchmarks and national standards, if those exist. Using common assessment tools also allows for the pooling of data from multiple jurisdictions to perform analyses on larger samples. The project’s results suggest a great need for the quick adoption of national performance standards, assessment instruments, and scoring methods that can be used productively and immediately and improved based on experience and evidence acquired over time.”<sup>90</sup>

## CURRENT CONGRESSIONAL INQUIRIES INTO THE USE OF PREPAREDNESS FUNDS

- Earlier this year, U.S. Senator Charles Grassley (R-IA) questioned the CDC's oversight of state public health funds for bioterrorism. Grassley called upon the CDC to demonstrate that grants for bioterrorism are being used appropriately and are having a positive impact, and asked the CDC to provide information about how it measures improvements in preparedness levels.
- The GAO is currently conducting a review at the request of Representative Bennie Thompson (D-MS), ranking member of the House Committee on Homeland Security, and Representative Edward Markey (D-MA), also a member of the committee, to look at CDC's Public Health Preparedness and Response for Bioterrorism Program and HRSA's National Bioterrorism Hospital Preparedness Program. Senator Grassley, chairman of the Senate Committee on Finance, and Senator Judd Gregg (R-NH), chairman of the Senate Committee on the Budget, have also signed on to the request. The GAO's first assignment is to examine how the CDC and HRSA develop performance measures, monitor performance, and measure the level of preparedness of states, localities, and hospitals that receive cooperative agreement funds, and how this information is communicated back to the states and communities in order to improve preparedness.
- On October 30, 2006 the Senate Committee on Homeland Security and Government Affairs requested that the GAO conduct a "survey and analysis of the research, development, testing, and evaluation and deployment programs for biological detection technologies across the government, academia and private industry."<sup>91</sup> The committee is looking into detection technologies and response capabilities for bioterror attacks, and how best to coordinate government and nongovernmental efforts. Such transparency is an important part of making sure that funds are being allocated where they can do the most good.

## EXAMPLES OF PRIOR INVESTIGATIONS AND STUDIES ABOUT USE OF PREPAREDNESS FUNDS AND PUBLIC HEALTH CAPABILITIES

- **HHS Office of the Inspector General (OIG):** Since 2003, the HHS OIG has issued a series of audits questioning how several states have used their CDC funds. Questions regarding unspent funds and possible misuse of funding have surfaced due to lack of formal accountability practices.<sup>92, 93, 94, 95, 96</sup>
- ▲ A 2006 report reviewing 12 state and 36 local health departments concluded that "states and localities were underprepared, and that planning documents tended to overstate preparedness," and "general readiness of state and local governments to detect and respond to bioterrorist attacks is below acceptable levels."<sup>97</sup>
- **Congressional Research Service (CRS):** A 2005 CRS report found that HRSA's hospital preparedness program had "been charged over the years with lacking sufficient focus to adequately direct funds in meaningful directions, or with failing to assure that emergency healthcare services will be available consistently across jurisdictions."<sup>98</sup>
- **Government Accountability Office (GAO):** A February 2004 GAO evaluation of the cooperative agreement program goals for 2002 found that, "states are more prepared now than they were prior to these [CDC and HRSA cooperative agreement] programs, but much remains to be accomplished."<sup>99</sup> A 2005 GAO report on public health information technology found unresolved issues including: integration of systems into a nationwide infrastructure without duplication of efforts; developing and implementing standards; and improving coordination.<sup>100</sup>

## EXAMPLES OF CDC AND HRSA PREPAREDNESS PERFORMANCE MEASURES

### CDC

States must meet specific “critical benchmarks” or “performance measures” in order to receive cooperative agreement funding for preparedness from the CDC. The CDC has been updating its measures each year. The CDC provided TFAH with the aggregate state data measuring the 2004 “critical benchmarks” as the most recent data set. As an example of the type of data collected, a portion of these benchmarks required states to self-report about the development of their plans for different threats. The states were also asked to report whether or not they tested their plans and if so, whether outcomes of these tests were incorporated into their plans. However, the states were not required to report on the outcomes themselves. Most states reported developing plans for a range of bio-threats, but many had not tested their plans. Also, less than half the states had developed plans for chemical threats such as nerve agents that disrupt the mechanism through which nerves transfer messages to organs (e.g., sarin), blood agents that limit the body from using oxygen (e.g., cyanogens chloride and hydrogen cyanide), and blister agents that cause severe skin, eye, and mucosal pain and irritation (e.g., mustard gas).

State Data to CDC: Development of Plans and Testing of Plans		
Threat	Has Detailed Jurisdiction-Wide Response Plan to Respond to the Listed Specific Threats:	Has Tested Jurisdiction-Wide Response Plan to Respond to Listed Specific Threats in the Last 12 Months:
Anthrax	85%	61%
Botulism	79%	25%
Plague	80%	37%
Smallpox	98%	33%
Tularemia	79%	32%
Nerve agents	44%	18%
Blood agents	41%	7%
Blister agents	41%	5%
Radiation/Nuclear	62%	40%
Pandemic flu	95%	56%

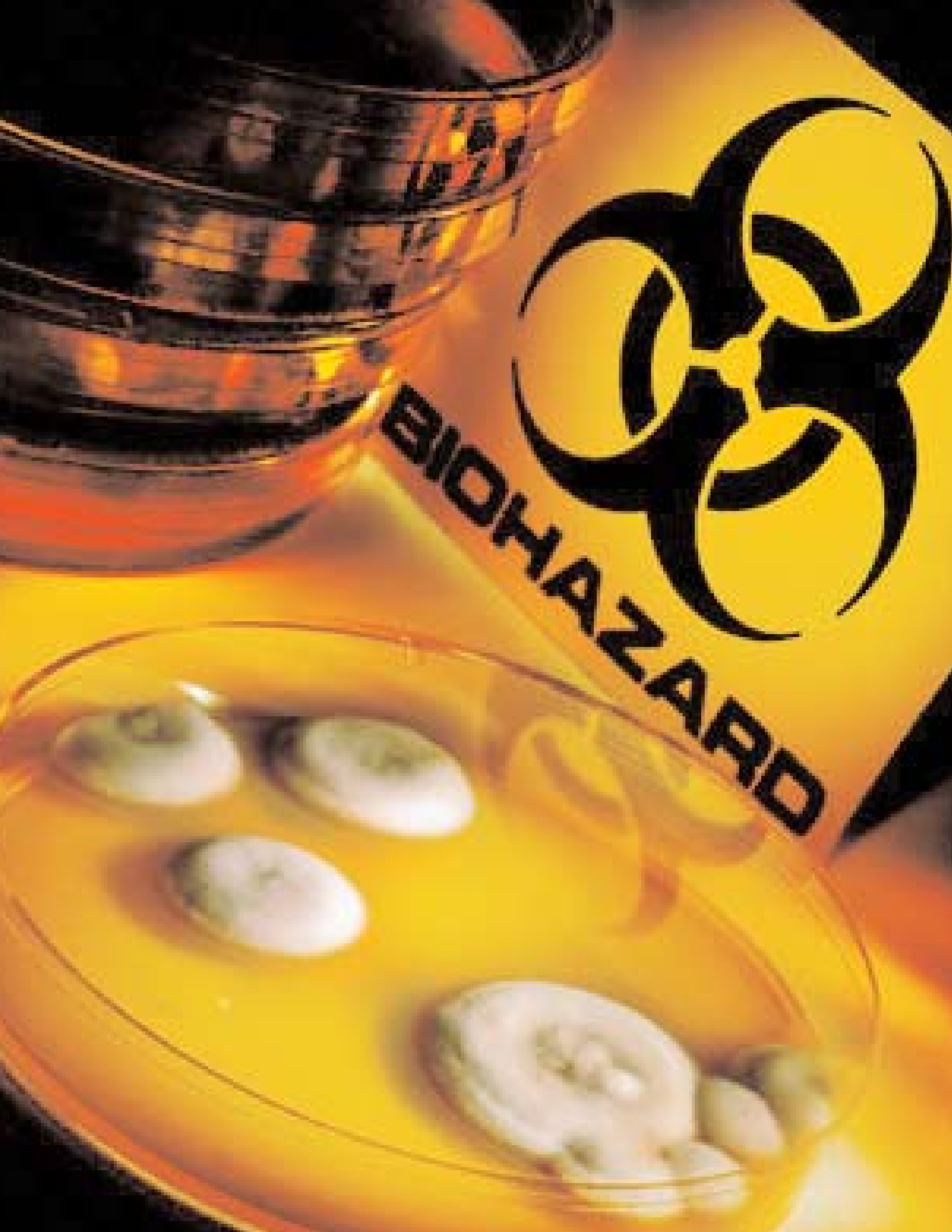
Source: CDC

As another example, 97 percent of states self-report as having a crisis and emergency risk communications plan, but there is no accompanying measurement system that evaluates the quality of the plans. Instead, current measures only focus on whether public health departments simply have the capability to share data with external “partners.”

### HRSA

HRSA lists preparedness program accomplishments on its Web page in aggregate form. One accomplishment measured via self-reporting by states is whether “jurisdictions have the capacity to maintain, in negative pressure isolation, **at least one suspected case** of a highly infectious disease or any febrile patient with a suspect rash or other symptoms of concern who might possibly be developing a potentially highly communicable disease.”<sup>101</sup> The usefulness of this measure is clearly limited, given most suspected bioterrorism or infectious disease outbreaks will involve more than one suspected case. Under fall 2006 avian flu guidelines from the Occupational Safety and Health Administration (OSHA) at the U.S. Department of Labor, isolation is suggested for all suspected patients, so clearly the capacity to isolate a single patient would be insufficient.<sup>102</sup>

Other “accomplishments” include difficult to measure objectives, such as whether jurisdictions “have been enhancing” or are “working to establish” networking capabilities, training, or effective communications systems.<sup>103</sup> Further “measures” report on whether jurisdictions have medical equipment, access to pharmaceuticals for healthcare workers, or have decontamination systems, but do not ask about quantities or specific resources.



# Additional Issues and Concerns

## I. BIOMEDICAL ADVANCED RESEARCH AND DEVELOPMENT AUTHORITY (BARDA)

During the Cold War, America was at risk of falling behind in military technology and the “Space Race.” Recognizing the need to stay competitive, DARPA, the Defense Advanced Research Projects Agency, was born. The agency, responsible for research and development of new technology for the military, has led to scientific breakthroughs including the Internet, microchips, tactical robots and airborne radar mapping systems. These breakthrough technologies continue to give the United States tactical and competitive advantages.

Today, the country faces a range of new threats, from bioterrorism to the pandemic flu, using outdated technology and equipment.

In December 2006, Congress passed legislation to create the Biomedical Advanced Research and Development Authority of 2006, known as BARDA, which could serve as a modern, public health version of DARPA, helping to jump-start a new cycle of innovation in vaccines, diagnostics, and therapeutics to combat health threats. BARDA would support research and development of new health technologies that could save thousands, if not millions, of lives.

BARDA would establish a new agency within HHS to provide incentives and guidance for research and development of products to counter bioterrorism and pandemic flu. It would:

- Encourage advanced research and development of those products.
- Facilitate collaboration among government, private industry, and academia.
- Promote scientific innovation to reduce the time and cost of development.

In addition, a National Biodefense Science Board advisory group would be established to provide scientific guidance to HHS on issues involving chemical, biological, radiological, and nuclear agents. BARDA would not impose new costs on local or state governments.

Funds for BARDA have already been appropriated as part of the FY 2006 pandemic preparedness funds.

## 2. E. COLI, MAD COW, AND BOTULISM SCARES IN 2006 RAISE CONCERNS OVER FOOD SAFETY AND AGROTERRORISM: PROTECTING AMERICA'S FOOD FROM FARM TO FORK

The E. coli contamination of spinach and lettuce, new mad cow disease scares, and naturally occurring botulism heightened concerns in 2006 about the vulnerability of the nation's food supply and the agricultural sector. Agroterrorism and naturally occurring food-borne illnesses are threats to both homeland and economic security.

- At more than a trillion dollars a year, agriculture represents one-sixth of the Gross Domestic Product and accounts for over \$50 billion in exports annually, the largest positive contribution to the national trade balance.<sup>104</sup>
- Agriculture and the food sector employ one out of every seven U.S. workers, more than any other single industry.
- Over 13 percent of all jobs in metropolitan areas are tied to agriculture and the food sector.
- Plant diseases alone currently cost the U.S. economy an estimated \$33 billion a year.<sup>105</sup>

“FOR THE LIFE OF ME, I CANNOT UNDERSTAND WHY THE TERRORISTS HAVE NOT ATTACKED OUR FOOD SUPPLY, BECAUSE IT IS SO EASY TO DO.”

-TOMMY THOMPSON, FORMER SECRETARY OF HEALTH AND HUMAN SERVICES<sup>106</sup>

Recent trends have complicated the nation's ability to protect the agricultural industry, making it possible for naturally occurring outbreaks in or terrorist attacks on the food supply to have a quick, widespread impact.

- Agriculture today is, for the most part, based on a mega-farm agribusiness model. As consolidation (shifting away from the single-family farm) has taken place, certain livestock or crops are increasingly centralized in specific regions and even certain farms. For example in 1990, 74 percent of all wet corn (a popular livestock feed) was milled by the top four processing firms in only 15 facilities.<sup>107</sup> Five million head of cattle were fattened by the top 30 feedlots in 1998.<sup>108</sup> And 83 percent of all beef in the U.S. was processed by the largest five beef packers in 32 plants.<sup>109</sup> This centralization facilitates the spread of disease by maximizing the contact between livestock or crops and enables a single infected animal or contaminated product to cause widespread damage.
- As specialized centers of activity have developed throughout the nation, livestock rearing has changed from a localized process to a geographically dispersed effort. An animal is most likely born on a breeding farm, at which point it is shuttled to a different farm for fattening, and then transported again for slaughter and processing. The carcass may even be sent to another state for disposal.<sup>110</sup> In addition, animals are frequently shown or displayed at regional shows or auctions. This mingling of animals from various regions of the country, as well as the highly mobile character of the industry, can accelerate the spread of disease.

The fact that there is a period of time between the infection of crops or livestock by pathogens and the development of symptoms makes it difficult to determine if a disease outbreak is naturally occurring or an act of terrorism. And if the infection does prove to be an act of terrorism, this elapse of time makes it more difficult to capture the perpetrators.

## Veterinary Vaccine and Medical Countermeasures Stockpile

Homeland Security Presidential Directive Nine, “Defense of United States Agriculture and Food,” calls for a coordinated national approach to countering threats to the food supply, including the formation of a National Plant Disease Recovery System and a National Veterinary Stockpile (NVS) of vaccines and countermeasures to protect livestock.

The VNS must be capable of deployment within 24 hours because rapid response is necessary to combat an outbreak.<sup>111</sup> The directive was issued in January 2004; however, a report from the GAO released in March 2005 reveals that the U.S. Department of Agriculture had not yet developed this capability, and formation of the NVS is moving slowly.<sup>112</sup> “USDA would not be able to deploy animal vaccines within 24 hours of an outbreak as called for in a presidential directive, in part because the only vaccines currently stored in the United States are for strains of foot and mouth disease, and these vaccines need to be sent to the United Kingdom (U.K.) to be activated for use.”<sup>113</sup>

## Food-Borne Threats

### *E. coli* 0157:H7

In the late summer and early fall of 2006, nearly 200 people became sick and at least three died due to *E. coli* contamination in spinach. It is possible that even more illnesses or deaths were related to the outbreak as “officials believe that for every *E. coli* case reported, 20 go unreported.”<sup>114</sup> *E. coli* often also goes undiagnosed.<sup>115, 116</sup>

“*Escherichia coli* O157:H7 (*E. coli*) is a leading cause of foodborne illness.”<sup>117</sup> *E. Coli* is mostly contracted through “eating undercooked, contaminated ground beef... (or) eating contaminated bean sprouts or fresh leafy vegetables such as lettuce and spinach. Person-to-person contact in families and child care centers is also a known mode of transmission.”<sup>118</sup>

The deaths and illnesses from the spinach have led to a renewed call for increased regulation. The FDA does not inspect produce on a similar scale as the USDA’s inspection of beef, and it has fewer inspectors and more facilities to inspect than it did in 2003.<sup>119</sup> Additionally, “more outbreaks of the disease are now traced to produce than to meat, poultry, fish, eggs, and milk combined.”<sup>120</sup>

Just prior to the outbreaks, the FDA in August had launched a “Lettuce Safety Initiative” to respond to “recurring outbreaks of *E. coli*” in lettuce.<sup>121</sup> The initiative will focus first on California regions, where a large portion of past outbreaks have occurred (including the most recent spinach outbreak), and will concentrate on the following objectives:

- Assessing industry approaches and actions.
- Early detection and rapid response.
- Observing and identifying practices that might lead to contamination.
- Consideration of regulatory action.<sup>122</sup>

“IN THE LAST 20 YEARS, THE INCIDENCE OF PRODUCE-RELATED FOOD-BORNE ILLNESS HAS INCREASED TWO AND A HALF TO THREE TIMES.”

—RICHARD H. LINTON, DIRECTOR OF THE CENTER FOR FOOD SAFETY ENGINEERING AT PURDUE UNIVERSITY<sup>123</sup>

## Botulism

There were also naturally occurring breakouts of botulism in the past year. At least four people became sick in the Southeast after drinking bottled carrot juice; officials believe the illnesses were due to botulism-causing bacteria in the drink.<sup>124</sup>

*Botulism is a “paralytic illness caused by a nerve toxin that is produced by the bacterium *Clostridium botulinum*.”<sup>125</sup> There are primarily three types of botulism: food-borne, wound, and infant. Food-borne is often the most deadly since it can affect a great deal of people with little effort.<sup>126</sup>*

In addition to the toxin occurring naturally, there are also concerns that botulism could be used as a weapon. A July 2005 issue of the *Proceedings of the National Academy of Sciences* outlined a relatively easy and potentially devastating method using botulism to kill thousands of people and disrupt the U.S. economy. The study, conducted by Stanford Graduate School of Business Professor Lawrence M. Wein, determined that “a mere four grams of botulinum toxin dropped into a milk production facility could cause serious illness and even death for 400,000 people in the United States.”<sup>127</sup>

The report recommended that the FDA make current volunteer safety guidelines mandatory, “such as requiring that milk tanks and trucks be locked and that two people be present when milk is transferred from one stage of the supply chain to the next. Before releasing milk into silos, milk-tank truck drivers should be required to employ a new 15-minute test that can detect the four types of toxins associated with human botulism.”<sup>128</sup>

In addition, the report became “one of the first test cases of how to balance scientific freedom and national security in the post-September 11 era.”<sup>129</sup> Federal officials questioned the value of the publication due to security concerns over misuse of its contents. As a result, the report’s release was delayed from May until July 2005.

## Disease Threats to Agriculture

### Mad Cow Disease

In March 2006, the USDA announced that a cow in Alabama tested positive for bovine spongiform encephalopathy (BSE), better known as mad cow disease. The Alabama cow was the third such case in the United States, with the first case occurring in Washington state in December 2003.<sup>130, 131</sup>

*Mad cow is a fatal illness that strikes the central nervous system of cattle. Humans can contract a related illness called variant Creutzfeldt Jakob disease (vCJD) by eating infected beef.*

Also in 2003, a single cow in Canada was diagnosed with mad cow disease, leading many nations (including the United States) to place a ban on Canadian cattle and beef imports. Economic losses due to the import bans have been massive, with estimates ranging from \$1.6 to \$3.2 billion.<sup>132</sup>

If a significant outbreak of mad cow disease in the United States occurred, the FDA estimates that there would be a loss of \$15 billion, resulting from a 24 percent decline in domestic beef sales and an 80 percent decline in beef and live cattle exports.<sup>133</sup> Slaughter and disposal costs of at-risk cattle could add up to an additional \$12 billion.<sup>134</sup> Experts point out that generally concerns about mad cow are related to animal health rather than human health in the U.S.

### Foot-and-Mouth Disease

In 2001, foot-and-mouth disease (FMD) was detected in sheep in England. Within seven months, four million animals had been destroyed, and the British economy was reeling from losses ranging from \$10-\$18 billion, at least \$5 billion of which came from a decline in tourism.<sup>135</sup>

*Foot-and-mouth disease* afflicts a variety of cloven-hoofed livestock, including cattle, sheep, goats, and swine. The disease is not typically fatal, and generally resolves within eight to 15 days. FMD is extremely infectious, and while animals may exhibit symptoms for only two weeks, the virus persists in the host and remains infectious for a number of months -- up to more than two years in cattle. FMD is not a risk to human health.

There has not been an outbreak of FMD in the United States since 1929. The ease with which it spreads, however, makes it a prime area of concern, and a number of exercises and estimates have been conducted recently to examine the capacity to respond to the disease and estimate the costs it could impose. In 2002, the USDA simulated the intentional introduction of FMD by a terrorist group. The simulation found that after initially introducing the disease at two farms, FMD spread to 12 states within 10 days, while the introduction of the disease at five farms lead to FMD infection in 35 states within 10 days.<sup>136</sup> The estimated costs of the eradication effort approached \$24 billion, in part due to the overwhelming number of animals that needed to be destroyed.<sup>137</sup> In fact, the leaders of the exercise questioned whether there would even be enough bullets to kill the 34-50 million animals needed to be euthanized.<sup>138</sup>

The United States maintains vaccine stockpiles against several strains of FMD only, but the vaccine is not readily available. Because vaccines have a limited shelf-life, the FMD vaccine stockpiles are stored as concentrates that must be activated before they can be used. In the event of an outbreak of FMD on U.S. soil, the vaccine would have to be shipped to England for activation, bottling, and testing. This process could take up to three weeks, not including the shipping time.<sup>139</sup>

### Rural America Expresses Concern About Being Left out of City-Based Strategies

While some experts in homeland security believe that urban areas are the most likely targets for terrorism, others point out that rural preparedness issues deserve serious consideration as well. In September 2004, a group of experts convened the conference, "Preparing for Public Health Emergencies: Meeting the Challenges in Rural America."<sup>140</sup> The conference reported on the limited resources in rural communities, particularly related to surge capacity which would be quickly overwhelmed in most rural communities in a major emergency. Additionally, the conference highlighted concerns related to animal livestock and other forms of agriculture, and water, air, and transportation issues.<sup>141</sup>

## Policy Recommendations

TFAH's recommendations for agroterrorism and naturally-occurring toxins are part of the all-hazards approach to public health preparedness, and include:

- 1. Leadership.** There are multiple agencies that are responsible for different aspects of food safety regulation and oversight, but no single entity or person in the government is designated as being "in charge."
- 2. Creating a unified system.** The GAO, Institute of Medicine (IOM), National Academies of Science (NAS), and consumer groups have all called for changes from the current fragmented federal food safety system to a single, independent food safety agency.<sup>142</sup>
- 3. Surveillance and disease tracking.** Tracking animal-borne diseases should be better integrated and coordinated with human health surveillance. Additionally, increased laboratory facilities and better trained personnel, particularly greater training to detect animal-diseases and a network of responders, are important to improving detection of outbreaks.
- 4. Education and communication.** Veterinarians and farm workers must be educated about terrorist threats (including learning about intelligence sharing and security measures) and naturally occurring disease (including symptoms, treatments, and reporting practices).
- 5. Coordination and planning.** Clear leadership structure and catastrophic planning, including scenario drills, are needed at every level of government and across sectors. All planning should involve government (federal, state, and local), academia, industry, and healthcare and veterinary representatives. Crisis management and contingency planning are integral to surviving an outbreak of food-borne or animal-borne disease, whether naturally occurring or as a result of a terrorist attack.

## 3. FIVE YEARS AFTER THE ANTHRAX ATTACKS, PROGRESS IS SLOW

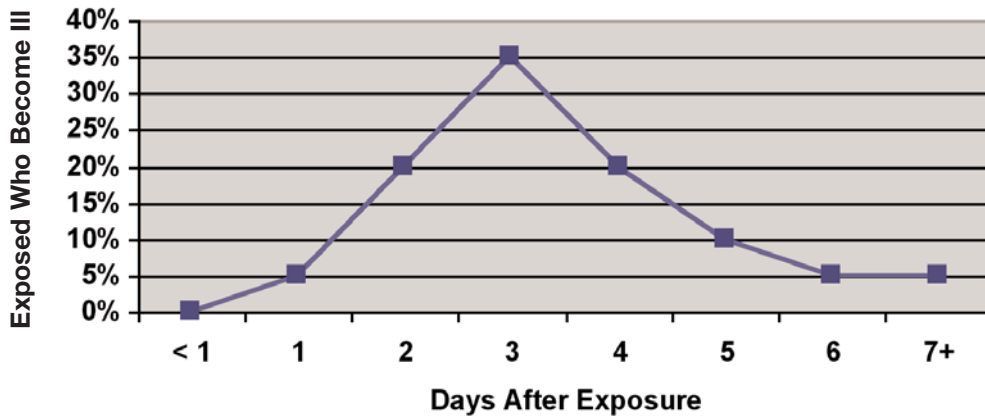
This fall marked the five-year anniversary of the 2001 anthrax attacks. Five people were killed, 17 people made sick, and another 10,000 persons were potentially exposed to anthrax in four states and the District of Columbia. To date no one has been charged with the attacks,<sup>143</sup> which severely disrupted business and government and led to the closure of some Congressional offices for days. The economic losses from the events, along with the cost of additional screening protections for the mail, totaled hundreds of millions of dollars.

While there currently is no good way of estimating the probability of an anthrax attack, steps can be taken to reduce the risk, as well as to mitigate losses. Recent experiences with anthrax illustrate how many lives and dollars can be saved through public health protection.

Based on clinical history with anthrax, medical professionals and economists have been able to forecast the potential impact of preparedness programs. The speed with which those exposed to anthrax receive antibiotics is the single most important means of reducing losses.<sup>144</sup> For example, medical professionals estimate greater than 50 percent increases in post-attack mortality rates from anthrax exposure when either the distribution of antibiotics is delayed or prophylactic adherence to antibiotics is substantially diminished.<sup>145</sup>

Anthrax has a short incubation period. As the graph below illustrates, the epidemic hits hardest two to four days after exposure. The number of lives lost and the economic losses to society increase exponentially for every day without public health intervention. Economic losses include hospitalization costs, the loss of expected future earnings, and the costs of post-hospitalization outpatient visits, outpatient visits of non-hospitalized patients, and interventions (such as pharmaceuticals).

### Epidemic Curve: Timeline of How Quickly People Could Become Ill After Exposure to Anthrax



Source: CDC report

The CDC considered a hypothetical anthrax attack on a city where 100,000 persons are exposed when a bioterrorist group releases an aerosol of anthrax along a line in the direction of the prevailing wind.<sup>146</sup> The aerosol cloud passes over the target area within two hours, and it is assumed that, when inhaled, the infectious dose is 20,000 spores.

The CDC estimates that if public health officials took six days to identify the attack under this scenario, an estimated 33,000 people would die, and economic losses would reach \$26.2 billion.<sup>147</sup> On the other hand, if public health officials responded within 24 hours, the number of lives lost would be roughly 5,000 and economic losses would reach \$128 million. In sum, according to the CDC, basic improvements to public health protection in the face of a plausible emergency could save 28,000 lives and \$26 billion.

#### Anthrax Preparedness Since 2001

A recent report by the Center for Biosecurity at the University of Pittsburgh Medical Center, *Anthrax Appraisal 5 Years Later: Top 10 Accomplishments and Remaining Challenges*, examined progress in preparing for the threat of anthrax since the 2001 tragedies.<sup>148</sup> The report's findings included:

- **Key accomplishments:** The stockpiling and/or ordering of antibiotics, vaccine, and other alternative medications to treat anthrax; improved diagnostics; legislation, awareness, and funding regarding bioterrorism; and greater research and communications.
- **Key needs to be accomplished:** Improving distribution of the SNS and doctrine for using the countermeasures included in it, as well as assuring vaccine delivery capacity; updating prophylaxis strategies and treatment guidelines, which have not been changed since the attacks in 2001 despite clinical knowledge learned in those attacks; general increase in healthcare system capacity to deal with emergencies; and the need for clinical education so that healthcare workers know how to treat anthrax victims properly.

The Center concludes that “while the federal government is responsible for some of the steps that remain to be taken, much of what remains to be done is the responsibility of state and local governments, hospitals, health departments, and medical schools.”<sup>149</sup>

### Moving Targets: Government Testing for Anthrax and Vaccinations Issues

In May 2006, GAO officials testified on anthrax testing and vaccines before the Subcommittee on National Security, Emerging Threats, and International Relations of the U.S. House of Representatives.<sup>150</sup> They reported that “the anthrax incidents in 2001 highlighted major gaps in civilian preparedness to detect and respond to anthrax attacks, leading the federal government to focus on developing new drugs, vaccines, and therapeutics to protect U.S. citizens.”<sup>151</sup>

The GAO has also raised concerns over the status of the development of a new anthrax vaccine, concluding that, “despite the many recommendations GAO has made over the past few years regarding problems related to the anthrax vaccine’s safety and effectiveness... deficiencies remain.”<sup>152</sup> The GAO is particularly critical of HHS’s contracting practices in that there is no risk protection for the contractor, and thus no incentive to go out on a limb and manufacture the vaccine. It also suggests that since this was the first contract awarded under BioShield legislation, it sets a precedent for all future contracts.

The GAO also points out that issues surrounding the new anthrax vaccine protocol “have not been studied. Data on the prevalence and duration of short-term reactions to the vaccines are limited...”<sup>153</sup> The GAO praised HHS for its progress regarding a “second-generation” anthrax vaccine and its aggressiveness in contracting to get the vaccine made and purchased.<sup>154</sup>

Since the outset of Project BioShield, concerns have been raised about the anthrax vaccine contract to VaxGen, which has never successfully brought a drug to market, but was awarded a \$887 million contract to produce 75 million doses.<sup>155</sup> No vaccine is currently publicly available. As VaxGen was about to undertake human testing on the vaccine in November, the FDA stopped it, citing “stability” issues and raising questions about how well the vaccine would hold up over time (i.e., during stock-piling), and if enough time had passed to be “clinically meaningful” in determining the vaccine’s efficacy.<sup>156</sup> HHS has given Vaxgen at least until mid-December 2006 to work out its issues with the FDA.<sup>157</sup> According to a letter sent to VaxGen in November 2006, HHS “plans to issue a contract modification to re-establish the due date for VaxGen to initiate its next clinical trial.”<sup>158</sup>

## 4. GAPS IN PRIVATE SECTOR AND COMMUNITY INVOLVEMENT IN PUBLIC HEALTH

During major emergencies, the resources of the regular public health system will be quickly overtaxed. Improving the nation’s health even in times of non-emergency requires the involvement of a wide range of sectors, including community and faith-based groups, businesses, and the media. These other sectors have important expertise and capabilities that help extend the reach of the public health goals and the goals of controlling and preventing health threats to the health of Americans.

Efforts to engage community, faith-based, business, and media groups in emergency health response planning is challenging and has lagged in most places in the country. Better incorporation of other sectors into public health emergency planning could greatly improve response efforts, and better prepare the public in advance for emergencies.

**Community Groups:** Community and faith-based groups routinely provide direct services to the public, and often have much greater capabilities to reach people with special needs. These non-governmental organizations demonstrated their ability to compliment and extend the abilities of government response in the aftermath of Hurricane Katrina. (For more discussion, please see number nine of this section).

**Businesses:** The business sector plays a vital role in public health concerns. Sickness and health problems among working-age Americans and their families carry an estimated price tag of \$260 billion in lost productivity each year, roughly 2.4 percent of gross domestic product.<sup>159</sup> The business community’s personnel health policies and plans to protect both its workforce and its continuity of operations in the face of an atypical and large-scale health emergency will have a major impact in any emergency response effort.

**Media:** Most members of the public receive information about health crises through the media. The media play a vital role in communicating about risks and ways people can protect themselves and their families. For instance, the media would be the dissemination vehicle for information about mass vaccination or antiviral distribution efforts in states. The media in the U.S., of course, also play a unique and important role of holding public officials accountable for their performance.

### California Pandemic Preparedness Symposium of October 2006

In October 2006, TFAH hosted a California Pandemic Preparedness Symposium in Los Angeles with the support of the Robert Wood Johnson Foundation, The Pew Charitable Trusts, and The California Endowment. The event brought key decision-makers together, including state and local government, the private sector -- including Intel, the Disney Company, Chevron Corp., City National Bank, and Westfield Malls -- and faith- and community-based organizations, to share information, voice concerns, and expose inevitable gaps in preparedness.

Participants in the exercise addressed a range of questions, including the following:

- **County public health**, how are you going to prioritize your limited amount of antiviral medication; and how are you going to explain those decisions to the public?
- **Healthcare sector**, will you be able to get your people to come to work?
- **Business community**, have you thought about ways to enable your employees to work offsite?
- **County and state**, what guidance will you give the public concerning non-pharmaceutical measures?
- **Community groups**, what questions do you have and what do you need from health officials right now?
- **Education sector**, how are you responding at this juncture?

*Source: Excerpt from a summary of the symposium, courtesy of the Robert Wood Johnson Foundation.*

### The Business Force of the Business Executives for National Security (BENS)

One example of public-private collaborations is the Business Force program at the Business Executives for National Security (BENS). The program fosters partnerships among businesses and state and local governments around the testing of vaccines and establishing points of distribution for medical supplies and vaccines in several communities across the country.

When facing public health threats, BENS believes the business community can play an important role in business continuity planning, which includes developing emergency response capabilities to protect the business and the health and safety of all employees. In addition, Business Force works in concert with state and local governments to implement specific preparedness and response capabilities by utilizing the expertise and resources of the private sector. Specifically, Business Force identifies four initiatives of value:

- 1) Mobilizing business volunteers to assist in the dispensing of the National Strategic Stockpile;
- 2) Building Business Response Networks — Web-based registries of pledged business resources that can be called upon by public officials in response to a catastrophic event or public health crisis;
- 3) Launching the Workplace Sentinel program — enlisting large numbers of employers to report anomalous rates of employee absenteeism to provide public health officials early indicators of disease; and
- 4) Integrating business into state and local emergency operations and intelligence fusion centers.<sup>160</sup>

## 5. RISK COMMUNICATIONS AND AMERICAN PUBLIC OPINION

Communicating with the public is a critically important part of any public health emergency. But public health communicators face numerous challenges. Many of the standard models for risk communications have not been updated to adjust to today's 24-hour news cycles and the proliferation of Internet, telephonic, radio, cable, and television news outlets. Also, risk communication strategies must do a better job of involving the public in planning for health emergencies.

Another challenge is that planners have difficulty predicting how the public will behave during a crisis. Some public opinion research has been conducted to try to assess how the public is likely to respond to major health threats. A 2004 study by Dr. Roz Lasker of the New York Academy of Medicine found that during a "dirty bomb" or smallpox attack, many people would not follow planners' protective instructions because "current plans have been developed without the direct involvement of the public...do not account for all the risks people would face...[and] make it very difficult for people to decide on the best course of action to protect themselves and their family."<sup>161</sup>

The Harvard School of Public Health conducted a public opinion survey of 1,607 Americans to find out what would happen during a severe pandemic flu outbreak in the United States and "possibly" in the respondents' own communities.<sup>162</sup> The study found that:

- Large majorities of Americans would follow public health recommendations for one month. These recommendations include avoiding air travel and public places and events, canceling routine medical appointments, and postponing family events.
- More than half (57 percent) would stay at home rather than go to work even if their employer "said to come to work."<sup>163</sup> Nearly half (48 percent) would "lose pay and have money problems" if they had to stay home for seven to 10 days due to their own illness or that of a family member, while just more than a quarter (27 percent) said it was "likely they or a household member would lose their job or business" from doing so.<sup>164</sup>
- Thirty-five percent thought they would need "a lot" or "some" help with problems of having children at home.<sup>165</sup>

Despite the public opinion research, experts point out it is challenging to predict in advance how people will really respond during actual events versus how they may think they would respond when presented with hypothetical scenarios.

## 6. CARING FOR CHILDREN DURING DISASTERS

In February 2006, the American Academy of Pediatrics' (AAP) Committee on Pediatric Emergency Medicine, Committee on Medical Liability, and Task Force on Terrorism published a policy statement, "The Pediatrician and Disaster Preparedness," giving pediatricians guidance on a variety of emergency preparedness issues.<sup>166</sup> The statement suggests that children are often overlooked in disaster and emergency preparedness planning and that pediatricians need to play a unique role in making sure that children are included in such planning. The policy statement recommends that:

1. Pediatricians should advocate for the inclusion of children's needs in all federal, state, and local disaster planning.
2. Pediatricians and pediatric trainees should become knowledgeable about issues related to pediatric disaster management, including chemical, biological, explosive, radiological, and nuclear events, and physician liability during disasters.
3. Pediatricians should participate in disaster planning by:
  - Taking part in local community and hospital disaster planning and drills.
  - Preparing and regularly updating and practicing an office disaster plan.
  - Working with schools and child care centers to develop disaster plans.
  - Providing anticipatory guidance to families on home disaster preparedness, with consideration given to the unique problems faced by children with special healthcare needs.
  - Participating with and providing guidance to medical volunteer programs such as disaster medical assistance teams, Medical Reserve Corps, and other response teams to ensure that they are equipped and trained for the care of children.
  - Pediatricians should educate themselves about liability issues during the acute and recovery phases of a disaster, including:
    - ▲ Individual states' Good Samaritan statutes and protections afforded while providing emergency care during a disaster and any limitations to those protections.
    - ▲ Individual liability insurance coverage protections and limitations outside of the usual scope of practice and practice settings when providing urgent and routine care.
    - ▲ The importance of working under the auspices of an official government or disaster agency so that volunteer liability protection can apply.<sup>167</sup>

"TERRORISM IS A REALITY IN THE UNITED STATES, AND BOMBS, GERMS, TOXIC GASES, AND THE FORCES OF NATURE DO NOT DISCRIMINATE BETWEEN CHILDREN AND ADULTS. DESPITE OUR BEST EFFORTS TO SHELTER AND PROTECT THEM, CHILDREN REMAIN AMONG THE MOST VULNERABLE VICTIMS OF TERRORISM AND NATURAL DISASTERS."

—AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ) REPORT, SEPTEMBER 2006.<sup>168</sup>

### Children Are More Vulnerable to Certain Attacks

Children are not simply "small adults." Treating them during a public health emergency brings unique challenges. For example, children have "physiological differences...[that] may enhance susceptibility and worsen prognosis after a chemical agent exposure."<sup>169</sup> And "a number of characteristics render the pediatric patient uniquely sensitive to" radiation as well.<sup>170</sup>

### **Majority of Schools Have Emergency Plans, But Drilling and Specificity Are Lacking**

A December 2005 study published in *Pediatrics* sought to determine the extent to which schools across the country were adhering to preparedness guidelines put out by the AAP and the American Heart Association. To do so, researchers surveyed nearly 600 school nurses with the help of the National Association of School Nurses.<sup>171</sup>

While 86 percent of schools represented in the survey sample had a medical emergency-response plan (MERP), only a third (33 percent) exercised the plan in a given year, and fully 35 percent of schools had “never practiced” it.<sup>172</sup> Communications and clear decision-making authority has been an issue across all sectors when dealing with emergency preparedness, and schools are no different. More than two-thirds (68 percent) of respondents’ schools did not have “an efficient and effective campus-wide communication system,” and in 13 percent of schools, there was no one person authorized “to make medical decisions when faced with a life-threatening emergency.”<sup>173</sup> The research recommends that “...communities, including physicians, EMS staff, and school staff members, assess their current state of school preparedness several times during the school year and ensure compliance with... published guidelines to improve the care of children in school.”<sup>174</sup>

### **Pediatric Concerns and the Strategic National Stockpile (SNS)**

States and experts have expressed concern that the SNS may not contain sufficient pediatric doses of medications and vaccines and other materials. In a 2005 survey TFAH conducted of emergency preparedness officials in eight states, the officials reported they had limited to no information about pediatric materials available in the SNS, and had not received guidance about pediatric dosing.

## 7. VULNERABLE POPULATIONS AND EMERGENCY PREPAREDNESS

There is universal concern about managing issues related to “vulnerable” or “special needs” populations during a public health emergency. A 2005 survey of experts conducted by TFAH based on a smallpox scenario found that while there is a belief that people in nursing homes and those who are regularly provided with social services can be reached in an emergency, there is great concern about those “outside the system” and those who have difficulty speaking English. There is also great concern about infectious disease outbreaks in special needs populations, such as people with limited access to Internet or cable news, limited English speakers, or people with some forms of disabilities; for instance, the reporting of such outbreaks might not occur in as timely a manner as they would in the mainstream population.<sup>175</sup>

A June 2006 “Nationwide Plan Review Phase 2 Report” by the DHS found that people living with special needs are “overlooked in all phases of emergency management.”<sup>176</sup>

“Special needs” populations can be defined as “people with disabilities, minority groups, people who do not speak English, children, and the elderly. In practice, the term also includes people who live in poverty or on public assistance; people without private transportation or who rely on public transportation; and people who rely on caregivers for assistance in daily living and would need similar assistance in an emergency...”<sup>177</sup>

The DHS report finds that while most emergency response plans mention such populations, “sorely lacking is any consistency of approach, depth of planning, or evidence of safeguards and effective implementation.”<sup>178</sup> The government’s review of community plans for special needs populations “revealed major fragmentation, inconsistencies, and critical gaps.”<sup>179</sup> Some of the report’s other important findings include:

- In most cases, states delegate matters of special needs populations, but provide for little oversight or assurance that assistance to such populations “will be executed in a timely and effective manner.”
- Few plans address the fact that traditional communications will often not reach special needs populations.
- Sheltering is often carried out by the American Red Cross; however, there are no mechanisms in place to make sure that local Red Cross chapters have the means to carry out that function.

“IN JULY 2004, PRESIDENT BUSH SIGNED EXECUTIVE ORDER 13347, “INDIVIDUALS WITH DISABILITIES IN EMERGENCY PREPAREDNESS,” TO STRENGTHEN PREPAREDNESS EFFORTS FOR THE DISABLED. THE EXECUTIVE ORDER ALSO CREATED THE INTERAGENCY COORDINATING COUNCIL (ICC) ON EMERGENCY PREPAREDNESS AND INDIVIDUALS WITH DISABILITIES WITHIN DHS TO IMPLEMENT THIS COORDINATED EFFORT BY THE FEDERAL AGENCIES.”<sup>180</sup>

—THE DEPARTMENT OF HOMELAND SECURITY’S “NATIONWIDE PLAN REVIEW PHASE 2 REPORT”

## 8. WORLD TRADE CENTER (WTC) HEALTH EFFECTS

*“When the WTC buildings collapsed on September 11, 2001, an estimated 250,000 to 400,000 people were immediately exposed to a noxious mixture of dust, debris, smoke, and potentially toxic contaminants in the air and on the ground, such as pulverized concrete, fibrous glass, particulate matter, and asbestos... Physical effects included injuries and respiratory conditions, such as sinusitis; asthma; and a new syndrome called WTC cough, which consists of persistent coughing accompanied by severe respiratory syndromes. Almost all firefighters who responded to the attack experienced respiratory effects, including WTC cough, and hundreds had to end their firefighting careers because of WTC-related respiratory illnesses.”<sup>181</sup>*

At least two studies published in the past year look at the health effects of 9/11 and the subsequent cleanup on emergency personnel and others who spent time at the WTC site. One study examined the health of more than 12,000 New York City emergency workers,<sup>182</sup> while a second looked more broadly at nearly 10,000 first responders (those who helped with cleanup at any of the staging sites, those who worked in the medical examiner’s office, or others in similar roles).<sup>183</sup> Both studies found severe respiratory problems related to amount of time spent among the rubble, as well as differences in severity of symptoms depending on where the bulk of time was spent. Further, those who responded on 9/11 and were caught in the WTC dust cloud upon collapse of the buildings exhibited markedly worse symptoms. Nearly a third (31 percent) of people in the broader sample “received medical care for WTC-related respiratory conditions,” and 17 percent missed work because of these conditions.<sup>184</sup>

A study of more than 8,000 WTC “adult survivors who were present between the time of the first airplane impact and noon on September 11 in any one of the 38 primarily nonresidential buildings or structures that were damaged or that collapsed” produced similar findings to the emergency worker health effects.<sup>185</sup> More than half (56.6 percent) of the adult survivors studied experienced respiratory problems (either new or worse than prior to 9/11), two percent were diagnosed with asthma after the attack, and more than a quarter (27 percent) had a “persistent cough.”<sup>186</sup> Again, those who were “in the dust and debris cloud” were far more likely to have respiratory problems, and those problems were worse than those who were not in the cloud.<sup>187</sup>

A key lesson learned is that there is a need for post-incident monitoring and ongoing care. Additionally, mechanisms should be explored for how to conduct research even as a disaster is unfolding, including data collection and analysis that could benefit victims and inform the development of future prevention, containment, and response strategies.

## 9. HURRICANE KATRINA: AN ANALYSIS OF THE RESPONSE EFFORT

*“Before Hurricane Katrina, the only prior recent incident for which a federal public health emergency had been declared was the terror attack of September 11, 2001.”<sup>188</sup>*

Hurricane Katrina delivered well-documented devastation to Louisiana, Mississippi, and other locations along the U.S. Gulf Coast. The confusion and human toll resulting from Katrina prompted numerous assessments of preparedness for national mass emergencies. Among several health-focused analyses, a recent report from the Congressional Research Service (CRS), *Hurricane Katrina: the Public Health and Medical Response*, examined the roles, responsibilities, and issues arising from the event.

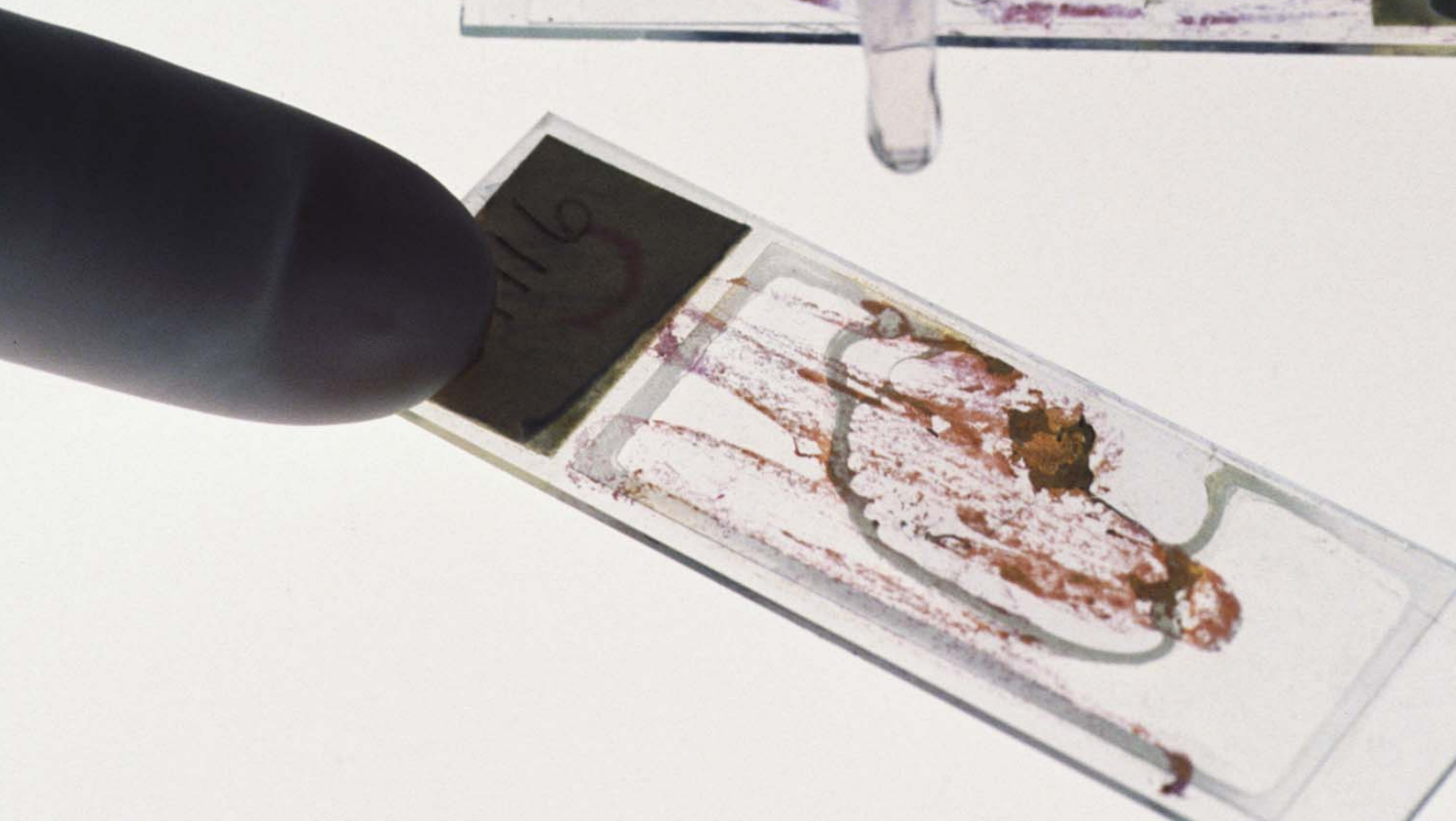
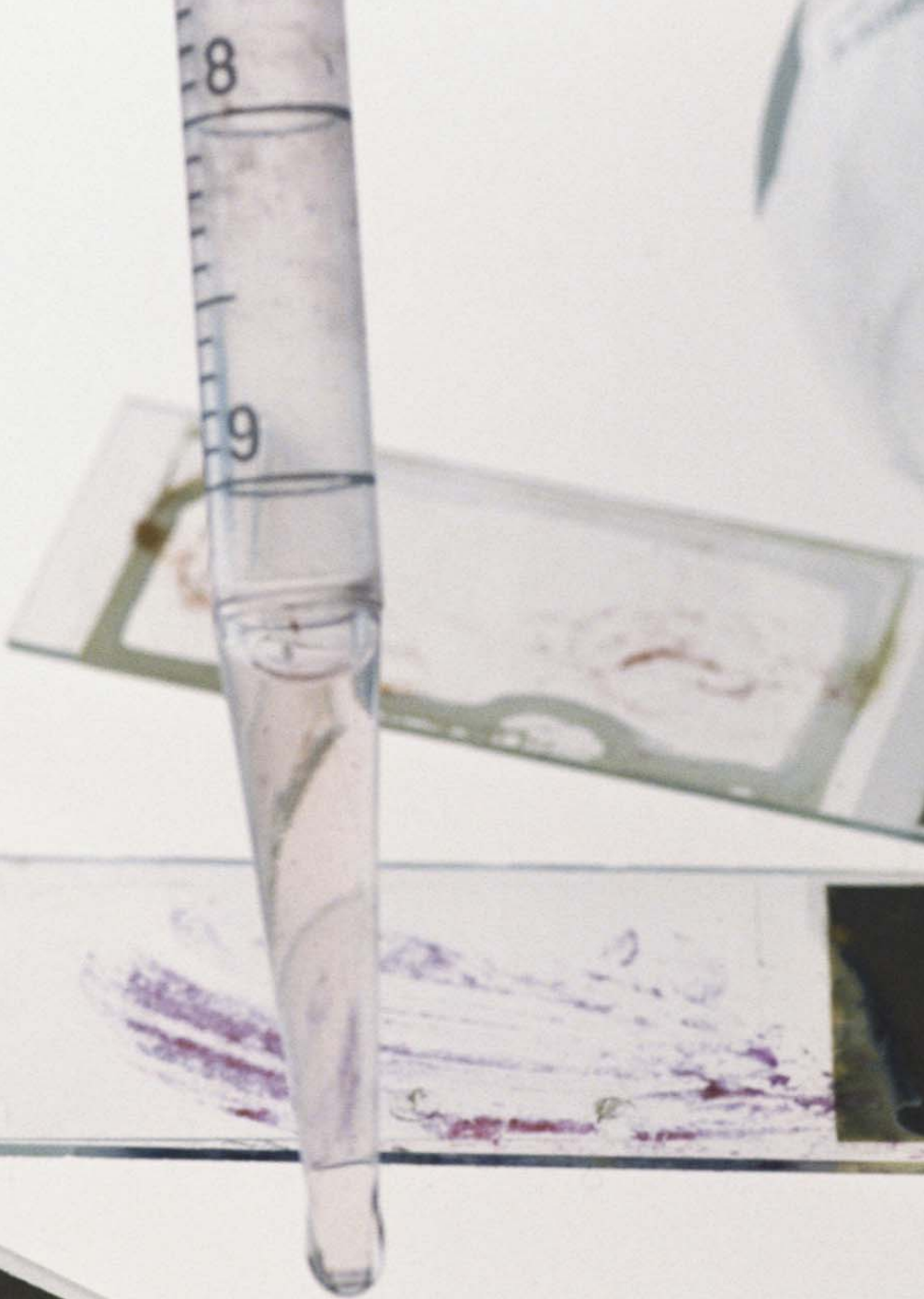
According to the CRS report, Hurricane Katrina “dealt some familiar blows in emergency response: the failure of communication systems and resultant difficulties in coordination challenged response efforts in this disaster as with others before it. Hurricane Katrina also pushed some response elements, such as plans for surge capacity in the healthcare workforce, to their limits for the first time in recent memory. The public health and medical response to Hurricane Katrina has also called attention to the matter of disaster planning in healthcare facilities, and the potential role of health information technology in expediting the care of displaced persons.”<sup>189</sup>

Katrina also identified additional gaps in emergency preparedness, including:

- Hospitals and medical providers overwhelmed, with doctors and nurses often working with few supplies, in unsanitary conditions, and without electricity.
- Insufficient measures taken to care for the chronically ill, those in nursing homes, and the disabled in the event of a mass emergency or needed evacuation.
- Stoppage in the chain of delivery of food, water, medicine, and other supplies due to the nation’s “just in time economy.”
- Disruption of emergency communications systems.
- Inconsistencies in infectious disease and public health hazard response.
- Providing limited, slow, and inconsistent information to the public.

The CRS study also catalogued six broad “Issues for Congress” with respect to improving future mass-emergency response:

- All-hazards preparedness.
- Coordinated needs assessments.
- A national disaster medical system.
- Continuity of operations and evacuation of healthcare facilities.
- Volunteer health professionals.
- Health information technology.<sup>190</sup>



# Recommendations

**F**ive years after 9/11, public health preparedness falls far short of what is required to protect the American people. The nation has made slow progress toward improving basic capabilities, but is nowhere near reaching adequate, let alone “optimally achievable,” levels of preparedness across the 50 states and D.C.

TFAH calls for accelerating public health preparedness efforts, and urges an “all-hazards” approach to help protect against a range of possible threats, including bioterrorism, natural disasters, and a major outbreak of a new, lethal strain of the flu.

To strengthen emergency preparedness, we must focus on five key areas:

- 1. Accountability.**
- 2. Leadership.**
- 3. Surge capacity and the workforce.**
- 4. Modernizing technology and equipment.**
- 5. Partnering more with the public.**

## I. ACCOUNTABILITY

Little concrete information is available to the public or policymakers about public health preparedness and remaining vulnerabilities. While the CDC and HRSA have been working toward more clearly defining “performance measures,” there is still not clear enough consensus about how to define and objectively determine standards for public health preparedness. The current measures focus too narrowly on process instead of outcomes or the ability to respond to wide-scale emergencies. Also, the information collected is largely based on self-reports and is only released in aggregate form, not on a state-by-state (or grantee-by-grantee) basis. Americans are not receiving the information they deserve to know about the safety of their own communities — or what standards they should hold the government accountable for.

HHS and its agencies should give the highest priority to defining measurable, “opti-

mally achievable” basic preparedness standards. These need to be baseline requirements that all states should be held accountable for reaching. The measures should include objective assessments and be able to gauge improvements on an ongoing basis.

- The federal government has chosen to take a “partnership” approach with states and localities for setting measures and goals. While collaboration and different perspectives are important, the “leadership by consensus” approach has resulted in neither leadership nor consensus. At this point, most opinions and differences have been voiced, and it is up to the federal government to break the deadlock and establish standards for the use of federal funds. The federal government should either determine standards or empower a committee of experts to determine the standards, but provide a clear, firm deadline by when they must be completed.

## Recommendations for Strengthening Accountability

<p><i>Establish concrete performance standards that take into account the need to prepare for mass emergencies</i></p>	<p>Concrete, measurable, achievable preparedness standards must be better focused on meeting the needs of major emergencies. The measures should be objective, clear standards that all states are held to, ensuring that all states and localities have equal levels of protection. The results of states' performance in achieving these measures should be assessed annually, and released publicly on a state-by-state basis.</p>
<p><i>Require tabletop exercises that include outcome measures and incorporation of lessons learned into future planning</i></p>	<p>Preparedness at the state level must be tested. Reporting of test outcomes to the public should be mandatory, along with what measures are being taken to correct identified deficiencies. There should be federally established mandatory guidelines and standardized baseline criteria for how tabletops should be approached. An independent mechanism should be established to <u>evaluate</u> exercises, including outcome measures from the tests. Additionally, lessons learned must be demonstrably incorporated into future preparedness planning.</p>
<p><i>Limit carry-over funding</i></p>	<p>The federal government should set a maximum for the percentage of a grant that can be carried over from one year to the next. In exceptional cases, governors should be able to request a waiver from this requirement from the secretary of HHS. Unspent money should be redistributed to states with demonstrated need and demonstrated capacity to spend it in the next year.</p>
<p><i>Demonstrate progress by providing information on a state-by-state basis to the public and policymakers</i></p>	<p>The federal government should require that each state or locality that receives funds be able to measurably demonstrate progress toward achieving the set objectives. HHS should make this information publicly available, on a state-by-state basis. States should be required to disclose their preparedness status and information about their use of federal funds (results of performance measures or "critical benchmarks") in order to be eligible to continue to receive these funds. Information provided in aggregate is inadequate, and does not provide enough detail to communities or policymakers. <u>Americans deserve to know how prepared their states and communities are, and what improvements are needed.</u></p> <p>HHS should begin this process immediately by releasing existing state-by-state information about use of preparedness funds. To start with, HHS, the CDC, and HRSA should make all of the aggregate information about the use of federal grants included in Section B of this report publicly available, and they should disaggregate it. Accountability rests on the ability of Congress, state policymakers, and taxpayers to know how their funds are being spent and with what results.</p>

## 2. LEADERSHIP

TFAH calls for increased leadership and oversight of U.S. bioterror and public health preparedness. HHS needs to integrate top-level

management of multiple bioterror and public health preparedness programs.

Recommendations for Leadership	
<i>Designate a single health official to be in charge</i>	HHS should have a single senior official accountable for all public health programs. With the current division of the Office of the Assistant Secretary for Health (ASH) and the Office of Public Health Emergency Preparedness (OPHEP), no one official below the secretary has the authority to coordinate and synthesize a national preparedness strategy among agencies. All public health agencies should report to the single official named. This official should have the authority to coordinate programs, determine budgets, and make personnel decisions. This position could be a newly formulated ASH (merging with OPHEP), or a new undersecretary or deputy secretary for health.
<i>Require M.O.U. agreements with states in order to receive federal preparedness funds</i>	Performance measures should be articulated in a Memorandum of Understanding between the secretary and the state governors for all preparedness grants from any federal agency.
<i>Incorporate federal preparedness guidance more effectively across programs</i>	All federally funded programs must demonstrate that they are incorporating federal recommendations regarding preparedness into their operations, including continuity of operations and effective communication with constituents, as a condition of continuing to receive funds.

## 3. SURGE CAPACITY AND WORKFORCE

Major health emergencies overtax the health systems of affected communities. Local, state, and federal emergency medical and public health planning must integrate academic health centers, large private healthcare sys-

tems, and private community hospitals, and consider how to stockpile equipment and other resources. Additionally, there is a massive impending public health workforce shortage that must be immediately addressed.

Recommendations for Surge Capacity and Workforce	
<i>Expand and fortify the volunteer medical workforce</i>	Federal, state, and local governments should more actively recruit and retain volunteer medical personnel into the National Disaster Medical System (NDMS) and Medical Reserve Corps (MRC). Use of these resources should be built into all plans for and responses to public health emergencies. In a large-scale, national emergency, responders will be needed in their own communities and may not be able to move to others.
<i>Take action to recruit a new generation to the public health workforce</i>	Congress should enact and fund programs to increase the size of the public health workforce capable of responding to bioterror and other public health emergencies, such as those described in the Public Health Preparedness Workforce Development Act of 2005.

## 4. MODERNIZE TECHNOLOGY AND EQUIPMENT

Basic technology and tools of public health must be modernized to adequately protect the American people.

Recommendations for Modernizing Technology and Equipment	
<i>Enhance research and development of vaccines and public health technologies</i>	The government must take measures to jump-start development of innovative vaccines and other pharmaceutical measures and technology for bio-threats, including pandemic flu, to 1) facilitate collaboration among government and the private sector, 2) enhance research and development, and 3) reduce the time and cost of research and development.
<i>Improve chemical and bio-hazard laboratory testing capabilities</i>	Public health laboratories should have state-of-the-art biological and chemical testing capabilities to better detect and contain outbreaks. Among other issues, the Association of Public Health Laboratories (APHL) reports a shortage of lab reagents, which are chemical compounds needed to test for bioterrorist agents.
<i>Modernize surveillance systems for operability between states/agencies</i>	Every health department and health agency should be part of a 21st century surveillance system that meets national standards and is interoperable between jurisdictions and agencies to ensure rapid information sharing with health officials, which is critical during infectious disease outbreaks or other health emergencies, such as a bioterror attack. Integration of current systems and standards into a nationwide infrastructure without duplicating efforts remains a significant challenge, according to a June 2005 GAO report. The movement towards electronic health records provides an opportunity to improve access to crucial mass population data.
<i>Bolster the Strategic National Stockpile (SNS)</i>	New ways must be found to bolster research, development, production, and acquisition of needed medicines and equipment for the stockpile. Additionally, ongoing concerns about the stockpile must be addressed, including 1) backup of routine medicines and equipment to care for those with chronic conditions, 2) promoting and finding ways to encourage best practices in states for improved delivery and administration of the stockpile, and 3) overhauling the federal SNS review process of states.

## 5. PARTNERING MORE WITH THE PUBLIC

Planning efforts must do a better job of recognizing that the media, general public, business community, and other audiences

will not always conform to procedures or expectations. Plans must be revised to address these challenges and contingencies.

<b>Recommendations for Improving Working with the Public</b>	
<i>Establish a temporary “State of Emergency” health benefit</i>	<p>Even during emergencies, individuals who are uninsured or underinsured may delay seeking diagnosis and treatment because of concerns that they would have to pay for services out-of-pocket, services they might not be able to afford. Particularly with infectious diseases, delayed diagnosis and treatment can undermine the potential value of prevention efforts to protect the larger population. Also, treatments for some bio-threats, such as pandemic flu and anthrax, are only effective when given at early stages of the disease, so delaying treatments could prove to be unnecessarily fatal and potentially jeopardize the health of others.</p> <p>An emergency health benefit to cover the uninsured and underinsured should be created to guarantee providers some level of compensation for the services they provide during a mass health emergency and so that individuals recognize that cost should not delay their coming forward for diagnosis and/or treatment.</p> <p>The benefit should also cover extended sick leave needs related to the emergency to encourage workers to stay home when they could be infectious, particularly since the majority of U.S. workers do not currently have sick leave benefits.</p>
<i>Do a better job of addressing vulnerable and “special needs” populations - and maximize community resiliency</i>	<p>These populations will always prove to be a serious challenge in the delivery of public health services. There should be a concerted effort and strong leadership at the national level to define these needs, ranging from language translation services to ambulatory care to reaching the disabled and homebound during mass vaccination or medication distribution efforts. This includes addressing ongoing social and economic realities, such as the challenge of following federal recommendations to stockpile medications for chronic conditions and policies for worker absenteeism leniency during mass health emergencies.</p>
<i>Modernize approaches to risk communications</i>	<p>Currently, most public health risk communications plans focus on how to get accurate information about health threats to the public. Risk communication strategies must go beyond planning for hourly press conferences to account for 24-hour news cycles and Internet communications, and recognize that the media now turn to a range of sources besides government for information and news.</p>

## FIVE THINGS THE FEDERAL GOVERNMENT SHOULD DO TODAY TO IMPROVE PUBLIC HEALTH PREPAREDNESS

1. Designate a single senior official accountable for all public health programs. The current division of the Office of the Assistant Secretary for Health (ASH), the Office of Public Health Emergency Preparedness (OPHEP), and the separate management of programs at the CDC and HRSA means no one official below the secretary is focused on a coordinated national preparedness strategy within HHS. All public health agencies should report to this official, who should have authority to coordinate programs, determine budgets, and make personnel decisions. This position could be a reformulated ASH (merging with OPHEP) or a new undersecretary or deputy secretary for health.
2. Clearly define a limited number of achievable priorities and accompanying standardized performance measures for holding states and localities accountable, including requiring testing of plans, issuance of after-action reports (AAR), and identification of corrective actions to be taken.
3. Publicly release the existing public health preparedness data from the CDC and HRSA on a state-by-state basis (examples of these data, which are currently only released in aggregate, are contained in Section B of this report).
4. Fully-fund existing public health emergency programs — and establish new funds for new programs. Currently, many public health programs are not funded at a level that is sufficient for states to achieve basic preparedness goals. Additionally, the practice of “reprogramming” funds away from state and local preparedness activities for new or existing initiatives should be eliminated until basic preparedness objectives have been achieved or the states demonstrate they are not making full use of the funds.
5. Create a “state of emergency” health benefit to ensure that the uninsured and underinsured will seek care during mass traumas. This measure is particularly important in the case of infectious disease outbreaks, such as a pandemic flu, where delays in seeking care could jeopardize containment strategies.

# Appendix A:

## CDC AND HRSA PREPAREDNESS GRANTS BY STATE

BIOTERRORISM FUNDING BY SOURCE AND YEAR								
State	CDC	FY 2005 HRSA	Total	State	CDC	FY 2006 HRSA	Total	% Change FY 05– FY 06
Alabama	\$12,809,991	\$7,326,068	\$20,136,059	Alabama	\$11,332,549	\$7,154,927	\$18,487,476	-8.2%
Alaska	\$5,210,372	\$1,484,009	\$6,694,381	Alaska	\$5,176,673	\$1,458,182	\$6,634,855	-0.9%
Arizona	\$17,067,370	\$8,964,023	\$26,031,393	Arizona	\$15,468,991	\$8,753,827	\$24,222,818	-6.9%
Arkansas	\$9,302,434	\$4,633,962	\$13,936,396	Arkansas	\$8,513,998	\$4,531,309	\$13,045,307	-6.4%
California	\$61,339,288	\$39,203,268	\$100,542,556	California	\$54,396,954	\$38,325,286	\$92,722,240	-7.8%
Colorado	\$13,937,566	\$7,401,669	\$21,339,235	Colorado	\$12,343,549	\$7,221,888	\$19,565,437	-8.3%
Connecticut	\$10,801,849	\$5,783,087	\$16,584,936	Connecticut	\$9,872,607	\$5,651,890	\$15,524,497	-6.4%
Delaware	\$5,596,144	\$1,739,851	\$7,335,995	Delaware	\$5,511,936	\$1,709,476	\$7,221,412	-1.6%
D.C.	\$11,931,316	\$1,854,320	\$13,785,636	D.C.	\$6,702,385	\$1,823,510	\$8,525,895	-38.2%
Florida	\$39,221,056	\$26,311,287	\$65,532,343	Florida	\$34,945,845	\$25,638,227	\$60,584,072	-7.6%
Georgia	\$22,321,610	\$13,671,367	\$35,992,977	Georgia	\$19,557,241	\$13,330,420	\$32,887,661	-8.6%
Hawaii	\$6,381,328	\$2,407,137	\$8,788,465	Hawaii	\$6,130,741	\$2,345,600	\$8,476,341	-3.6%
Idaho	\$6,629,932	\$2,572,244	\$9,202,176	Idaho	\$6,389,623	\$2,521,506	\$8,911,129	-3.2%
Illinois	\$24,044,099	\$15,578,388	\$39,622,487	Illinois	\$20,613,241	\$14,951,481	\$35,564,722	-10.2%
Indiana	\$16,461,162	\$9,896,622	\$26,357,784	Indiana	\$14,502,083	\$9,660,723	\$24,162,806	-8.3%
Iowa	\$9,725,489	\$4,965,024	\$14,690,513	Iowa	\$8,810,613	\$4,846,845	\$13,657,458	-7.0%
Kansas	\$9,296,532	\$4,630,597	\$13,927,129	Kansas	\$8,724,480	\$4,525,854	\$13,250,334	-4.9%
Kentucky	\$12,048,544	\$6,745,252	\$18,793,796	Kentucky	\$10,860,671	\$6,585,429	\$17,446,100	-7.2%
Louisiana	\$12,790,121	\$7,319,242	\$20,109,363	Louisiana	\$11,478,386	\$7,139,266	\$18,617,652	-7.4%
Maine	\$6,606,543	\$2,480,391	\$9,086,934	Maine	\$6,321,437	\$2,434,432	\$8,755,869	-3.6%
Maryland	\$15,290,917	\$8,855,085	\$24,146,002	Maryland	\$13,970,053	\$8,645,984	\$22,616,037	-6.3%
Massachusetts	\$17,872,452	\$10,256,868	\$28,129,320	Massachusetts	\$15,512,606	\$9,983,770	\$25,496,376	-9.4%
Michigan	\$27,105,748	\$15,787,720	\$42,893,468	Michigan	\$23,221,202	\$15,395,465	\$38,616,667	-10.0%
Minnesota	\$15,003,826	\$8,173,336	\$23,177,162	Minnesota	\$13,134,147	\$7,983,328	\$21,117,475	-8.9%
Mississippi	\$9,608,208	\$4,869,883	\$14,478,091	Mississippi	\$8,738,914	\$4,759,591	\$13,498,505	-6.8%
Missouri	\$16,321,799	\$9,151,953	\$25,473,752	Missouri	\$14,402,196	\$8,951,388	\$23,353,584	-8.3%
Montana	\$5,751,801	\$1,891,709	\$7,643,510	Montana	\$5,616,551	\$1,856,928	\$7,473,479	-2.2%
Nebraska	\$7,346,564	\$3,137,831	\$10,484,395	Nebraska	\$6,897,069	\$3,067,393	\$9,964,462	-5.0%
Nevada	\$9,267,629	\$3,899,038	\$13,166,667	Nevada	\$8,660,838	\$3,818,014	\$12,478,852	-5.2%
New Hampshire	\$6,526,889	\$2,452,975	\$8,979,864	New Hampshire	\$6,252,371	\$2,404,444	\$8,656,815	-3.6%
New Jersey	\$21,953,336	\$13,601,391	\$35,554,727	New Jersey	\$18,894,214	\$13,269,518	\$32,163,732	-9.5%
New Mexico	\$8,810,432	\$3,343,195	\$12,153,627	New Mexico	\$8,351,763	\$3,276,757	\$11,628,520	-4.3%
New York	\$28,293,465	\$17,747,875	\$46,041,340	New York	\$24,409,091	\$16,937,704	\$41,346,795	-10.2%
North Carolina	\$20,547,098	\$13,251,044	\$33,798,142	North Carolina	\$17,877,794	\$12,948,887	\$30,826,681	-8.8%
North Dakota	\$5,193,519	\$1,461,290	\$6,654,809	North Dakota	\$5,147,111	\$1,435,800	\$6,582,911	-1.1%
Ohio	\$27,902,321	\$17,843,984	\$45,746,305	Ohio	\$24,190,050	\$17,397,207	\$41,587,257	-9.1%
Oklahoma	\$10,840,379	\$5,825,603	\$16,665,982	Oklahoma	\$9,732,169	\$5,681,308	\$15,413,477	-7.5%
Oregon	\$11,154,657	\$5,898,716	\$17,053,373	Oregon	\$10,251,502	\$5,767,951	\$16,019,453	-6.1%
Pennsylvania	\$30,976,767	\$19,254,011	\$50,230,778	Pennsylvania	\$26,235,793	\$18,776,677	\$45,012,470	-10.4%
Rhode Island	\$6,240,298	\$2,132,147	\$8,372,445	Rhode Island	\$5,981,291	\$2,089,651	\$8,070,942	-3.6%
South Carolina	\$12,108,891	\$6,789,755	\$18,898,646	South Carolina	\$10,852,835	\$6,632,258	\$17,485,093	-7.5%
South Dakota	\$5,425,710	\$1,659,192	\$7,084,902	South Dakota	\$5,339,585	\$1,630,322	\$6,969,907	-1.6%
Tennessee	\$15,459,458	\$9,359,882	\$24,819,340	Tennessee	\$13,759,228	\$9,138,647	\$22,897,875	-7.7%
Texas	\$53,589,709	\$34,045,388	\$87,635,097	Texas	\$46,595,417	\$33,177,278	\$79,772,695	-9.0%
Utah	\$8,560,504	\$4,066,334	\$12,626,838	Utah	\$8,023,438	\$3,978,558	\$12,001,996	-4.9%
Vermont	\$5,186,880	\$1,438,965	\$6,625,845	Vermont	\$5,144,876	\$1,415,048	\$6,559,924	-1.0%
Virginia	\$20,475,283	\$11,701,905	\$32,177,188	Virginia	\$18,466,632	\$11,387,068	\$29,853,700	-7.2%
Washington	\$17,350,613	\$9,799,166	\$27,149,779	Washington	\$15,353,518	\$9,562,647	\$24,916,165	-8.2%
West Virginia	\$7,498,508	\$3,245,672	\$10,744,180	West Virginia	\$6,994,949	\$3,176,132	\$10,171,081	-5.3%
Wisconsin	\$14,975,480	\$8,799,529	\$23,775,009	Wisconsin	\$13,246,911	\$8,588,953	\$21,835,864	-8.2%
Wyoming	\$4,906,684	\$1,260,221	\$6,166,905	Wyoming	\$4,917,055	\$1,241,982	\$6,159,037	-0.1%
	<b>CDC Total FY 05*</b>	<b>HRSA Total FY 05*</b>	<b>Grand Total FY 05*</b>		<b>CDC Total FY 06*</b>	<b>HRSA Total FY 06*</b>	<b>Grand Total FY 06*</b>	<b>Grand Total % Change FY 05–FY 06</b>
	\$862,777,000	\$470,755,000	\$1,333,532,000		\$766,440,000	\$460,216,752	\$1,226,656,752	-8.0%

\*Note that totals include U.S. Territories, such as Puerto Rico and Guam, and Freely Associated States of the Pacific, such as the Marshall Islands, as well as the 50 states and D.C.

Source: HHS Announces \$1.2 Billion in Funding To States For Bioterrorism Preparedness, June 7, 2006 News Release.  
<http://www.hhs.gov/news/press/2006press/20060607.html>

## CITIES READINESS INITIATIVES

Cities Readiness Initiative (CRI) awards increased in FY 2006 from 36 to 72 metropolitan areas and included each of the 50 states. CRI seeks to “ensure (that) the selected cities are prepared to provide oral medications during a public health emergency to 100 percent of their affected populations. This entails enhancing each city’s dispensing plans with trained staff and developing and testing plans that include alternative means of delivery. Known as mass prophylaxis, this effort is considered the top public health priority identified in the National Preparedness Goal.”<sup>191</sup>

See the 2004 and 2005 versions of *Ready or Not?* for more discussion on CRI.

The new cities include: Birmingham, AL; Anchorage, AK; Little Rock, AR; Fresno, CA; Hartford, CT; New Haven, CT; Dover, DE; Honolulu, HI; Boise, ID; Peoria, IL; Des Moines, IA; Wichita, KS; Louisville, KY; New Orleans, LA; Baton Rouge, LA; Portland, ME; Jackson, MS; Billings MT; Omaha, NE; Manchester, NH; Trenton, NJ; Albuquerque, NM; Buffalo, NY; Albany, NY; Charlotte, NC; Fargo, ND; Oklahoma City, OK; Columbia, SC; Sioux Falls, SD; Nashville, TN; Memphis, TN; Salt Lake City, UT; Burlington, VT; Richmond, VA; Charleston, WV; and Cheyenne, WY.<sup>192</sup>

Previous CRI cities have included: Phoenix, AZ; Los Angeles, CA; Riverside, CA; Sacramento, CA; San Diego, CA; San Francisco, CA; San Jose, CA; Chicago, IL; Denver, CO; Miami, FL; Orlando, FL; Tampa, FL; Atlanta, GA; Indianapolis, IN; Baltimore, MD; Boston, MA; Detroit, MI; Minneapolis, MN; St. Louis, MO; Kansas City, MO; Las Vegas, NV; New York City, NY; Cincinnati, OH; Cleveland, OH; Columbus, OH; Portland, OR; Philadelphia, PA; Pittsburgh, PA; Providence, RI; Dallas, TX; Houston, TX; San Antonio, TX; Virginia Beach, VA; Seattle, WA; Washington, DC; and Milwaukee, WI.

In many cases the CRI award is allocated to larger geographic or metropolitan areas; however, only the major city is listed here.

# Appendix B:

## CDC AND HRSA “COOPERATIVE AGREEMENT” GRANT GUIDANCE SUMMARIES

### PUBLIC HEALTH PREPAREDNESS POST-SEPTEMBER 11

In June 2002, Congress passed the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, which included the authorization of additional funds to help revitalize public health emergency preparedness. The funds support federal bioterrorism programs as well as provide grants to states through the CDC and the HRSA.

CDC funds to states are intended to support:

- Preparedness planning, including planning for deployment of the Strategic National Stockpile.
- Surveillance and epidemiology.
- Laboratory capacity for biological and chemical agents.
- Information technology, including the Health Alert Network.
- Communications about health threats.
- Education and workforce training.<sup>193</sup>

The federal grants are then apportioned among state and local jurisdictions. The states and localities are required to demonstrate a “consensus, approval, or concurrence between state and local public health” officials and departments concerning the use of the federal funds.<sup>194</sup>

The HRSA funds are intended to aid state hospital preparedness for mass emergency situations such as bioterrorism. Congress authorized \$520 million for this program in FY 2003, and “such sums as may be necessary through 2006.”<sup>195</sup>

The funds, awarded as cooperative agreements, are distributed “according to a formula of a base amount plus an amount according to population to the same awardees as the CDC grants (50 states, the District of Columbia, territories, the cities of New York and Chicago, and Los Angeles County), and are also administered by the state, territorial or municipal health officials.”<sup>196</sup>

The HRSA guidance also stipulates that “80 [percent] of the funding awarded to state health departments should be passed through to hospitals, emergency medical systems, and other healthcare entities,” specifically poison control centers and health centers.<sup>197</sup>

The HRSA funds are designed to “ensure that hospitals and other healthcare facilities have the capacity to respond to public health emergencies” and effectively collaborate with CDC grantees during a bioterror attack or other mass emergency event.<sup>198</sup> These funds are intended to focus on priority areas, including:

- Administration.
- Surge capacity.
- Emergency medical services.
- Linkages to public health departments.
- Education and preparedness training.
- Terrorism preparedness exercises.<sup>199</sup>

Effective response to any large-scale emergency situation requires a coordinated effort between the public health and healthcare delivery sectors. To facilitate cooperation and competencies between CDC and HRSA grantees, the guidance to states also contains cross-cutting benchmarks relevant for both CDC and HRSA grantees.

# Appendix C:

## METHODOLOGY FOR STATE PUBLIC HEALTH BUDGET INDICATOR

TFAH conducted an analysis of state spending on public health for the last two budget cycles, fiscal years 2004-2005 and 2005-2006. For those states which only report their budgets in biennium cycles, the 2005-2007 period (or the 2004-2006 and 2005-2006 period for Virginia and Wyoming respectively) was used, and the percent change was calculated from the last biennium, 2003-2005 (or 2002-2004 and 2003-2004 for Virginia and Wyoming respectively).

This analysis was conducted from July to October of 2006 using publicly available budget documents through state government Websites. Based on what was made publicly available, budget documents used included either executive budget documents that listed actual expenditures, estimated expenditures, or final appropriations; appropriations bills enacted by the state's legislature; or documents from legislative analysis offices.

In response to feedback received from previous editions of TFAH's *Ready or Not* report, TFAH defined "public health" to broadly include all health spending with the exception of Medicaid, CHIP, or comparable health coverage programs for low-income

residents. Mental health funds, addiction or substance abuse-related funds, services related to developmental disabilities or severely disabled persons, or state-sponsored pharmaceutical programs also were not included. In a few cases, state budget documents did not allow these - or other similar human services - programs to be disaggregated; these exceptions will be noted. For most states, all state funding - regardless of general revenue or other state funds (e.g., dedicated revenue, fee revenue, etc.) - was used. In some cases, only general revenue funds were used in order to separate out federal funds; these exceptions will also be noted.

Since each state allocates and reports its budget in a unique way, comparisons across states are obviously difficult. This methodology may include or not include programs in some cases that the state may consider a public health function, but the methodology used was selected to maximize the ability to be consistent across states. Therefore, there may be programs or items states may wish to be considered as "public health" that may not be included in order to maintain the comparative value of the data.

# Appendix D:

## METHODOLOGY FOR FLU VACCINATION RATES

Data for this analysis were obtained from the Behavioral Risk Factor Surveillance System dataset (publicly available on the Web at [cdc.gov/brfss](http://cdc.gov/brfss)). BRFSS is an annual cross-sectional survey designed to measure behavioral risk factors in the adult population (18 years of age or older) living in households. Data are collected from a random sample of adults (one per household) through a telephone survey. The BRFSS currently includes data from 50 states, D.C., Puerto Rico, Guam, and the Virgin Islands. The 2005 statistics were the most recent data available.

To conduct the analyses, TFAH contracted with Daniel Eisenberg, Ph.D., Assistant Professor, and Edward N. Okeke, MBBS, Health Service Organization and Policy Doctoral Student, at the Department of Health

Management and Policy of the University of Michigan School of Public Health.

Data were weighted using sample weights provided by the CDC in the dataset, then they were merged with years 2002-2005 of the FLUSHOT variable. The FLUSHOT variable is the question, “During the past 12 months, have you had a flu shot?” Observations where respondents answered “don’t know” or refused to answer were dropped from the analysis, though this accounted for less than 0.3 percent of the data. Three-year rolling averages were then calculated for individuals aged 65 and older, by state. Hypothesis testing, to determine if there were significant changes from 2002/2004 to 2003/2005, was then carried out. The sample size was 385,931 cases.

### BRFSS Data Collection in States

According to information the CDC provided to TFAH, each state conducts its own survey for BRFSS. States conduct interviews during each month in accordance with a standardized prescribed protocol, and enter results into computer-assisted telephone interviewing (CATI) computer files. States edit and correct completed interviews each month using an edit program provided by

the CDC. Data are submitted to the CDC on a monthly basis, where the data undergo rigorous data quality checks.

While the system has existed since 1984, all states have participated since 1994. Data are collected and analyzed using standardized methodology, and results are released annually.

## Flu Vaccination Rates for 2003, 2004, and 2005 Not Combined

	Influenza Vaccination: Adults Aged 65 and Older Who Had a Flu Shot in the Past Year		
	2003	2004	2005
Alabama	70.2%	66.2%	60.8%
Alaska	66.5%	64.1%	61.1%
Arizona	68.9%	66.1%	62.5%
Arkansas	71.0%	68.7%	65.2%
California	72.5%	70.9%	65.9%
Colorado	74.2%	<b>78.8%</b>	74.2%
Connecticut	74.3%	73.1%	71.1%
Delaware	70.0%	<b>69.3%</b>	65.7%
District of Columbia	63.0%	54.9%	<b>54.7%</b>
Florida	65.9%	<b>65.1%</b>	55.6%
Georgia	67.0%	64.4%	60.8%
Hawaii	76.4%	NA	72.1%
Idaho	70.3%	66.2%	63.9%
Illinois	62.2%	<b>65.4%</b>	55.9%
Indiana	66.1%	64.3%	<b>64.0%</b>
Iowa	77.5%	74.1%	71.7%
Kansas	70.8%	68.1%	65.9%
Kentucky	69.1%	64.3%	62.4%
Louisiana	68.3%	<b>68.6%</b>	62.4%
Maine	74.8%	72.2%	67.7%
Maryland	68.4%	64.6%	59.3%
Massachusetts	74.9%	70.6%	<b>69.8%</b>
Michigan	67.5%	<b>66.9%</b>	<b>67.1%</b>
Minnesota	80.3%	78.3%	<b>78.1%</b>
Mississippi	69.0%	66.9%	61.5%
Missouri	69.9%	<b>69.1%</b>	61.7%
Montana	72.8%	<b>72.2%</b>	69.5%
Nebraska	73.6%	<b>75.8%</b>	72.6%
Nevada	60.0%	<b>59.0%</b>	53.0%
New Hampshire	73.9%	70.7%	<b>70.2%</b>
New Jersey	67.2%	<b>67.6%</b>	63.4%
New Mexico	72.4%	<b>72.4%</b>	68.0%
New York	68.0%	65.9%	61.8%
North Carolina	68.8%	67.0%	65.5%
North Dakota	73.0%	<b>74.3%</b>	70.1%
Ohio	68.0%	<b>67.6%</b>	64.7%
Oklahoma	75.8%	<b>75.0%</b>	73.2%
Oregon	70.5%	<b>71.0%</b>	68.9%
Pennsylvania	69.1%	63.8%	59.3%
Rhode Island	76.2%	73.0%	67.2%
South Carolina	69.3%	66.0%	60.9%
South Dakota	77.9%	<b>76.9%</b>	<b>76.3%</b>
Tennessee	69.1%	66.4%	61.6%
Texas	67.7%	<b>67.1%</b>	61.6%
Utah	74.8%	<b>75.5%</b>	69.6%
Vermont	74.1%	66.6%	<b>66.3%</b>
Virginia	69.6%	<b>68.6%</b>	66.8%
Washington	73.4%	67.9%	<b>67.8%</b>
West Virginia	69.1%	67.9%	63.6%
Wisconsin	72.1%	<b>74.3%</b>	71.8%
Wyoming	72.6%	<b>73.8%</b>	<b>72.9%</b>

Source: CDC's BRFSS data

Increases from 2003 to 2004 are notated in **blue bolded font**; increases from 2004 to 2005 are notated in **green bolded font**. States in **orange bolded font** were within one percentage point of the previous year's percentage. Note that these are not necessarily statistically significant increases like those figures used for the indicator; these are simple comparisons of flu shot rates as reported by CDC.

# Appendix E:

## METHODOLOGY FOR THE NURSING SHORTAGE STUDY

The National Center for Health Workforce Analysis (NCHWA) projects nursing supply and demand in each state using the Nursing Supply Model (NSM) and the Nursing Demand Model (NDM). Both nursing supply and demand are measured in units of full-time equivalent (FTE) RNs. Under the NSM, nursing supply constitutes only the “active RN supply” (i.e., those who are providing nursing services or seeking employment in nursing).<sup>200</sup> Those nurses who work full-time are each counted as one FTE, while those who work only part-time or for only part of the year are each counted as one-half of an FTE. Under the NDM, nursing demand is “defined as the number of FTE RNs whom employers are willing to hire given population needs, economic considerations, the healthcare operating environment, and other factors.”<sup>201</sup>

To project nursing supply in each state, the NSM factors in the number of new graduates from nursing programs, the location and employment patterns of the current licensed nurse population (e.g., RNs may tend to migrate to certain states due to better wages or career opportunities), and separations from the nurse workforce (e.g., retirement, death, etc.) The NDM projects nursing demand in each state as a function of changing demographics (e.g., the mean age of a state population), patient acuity (i.e., the level of care that patients require), economic factors, and various characteristics of the healthcare operating environment (e.g., advances in medical technology). All of these factors have the potential to impact patient demand for RN services. For example, if the average age of a state increases, demand for nursing services is expected to increase based on the idea that the elderly have greater healthcare needs than non-elderly patients.

It is important to note that the state-by-state RN supply and demand projections for 2005 reflect baseline numbers. These baseline

numbers reflect the likely demand and supply of nurses that will occur if trends continue. For example, under the baseline scenario, the NDM “assumes that per capita inpatient surgeries will decline by two percent annually from 2000 to 2020 and that these surgeries will instead be performed on an outpatient basis” due to advances in medical technology and an increasing pressure on hospitals to stem rising healthcare costs.<sup>202</sup> This current trend has the potential to decrease demand for RN services in the hospital setting since more patients will be receiving outpatient surgeries. While the NDM and NSM can be adjusted to reflect changes in trends, the nursing workforce projections in the table above are based on current trends.

A limitation of the NSM and the NDM is that they are independent models. The NDM “makes projections without considering the potential supply of nurses and vice versa.”<sup>203</sup> In reality, the size of a state’s nursing workforce is dependent upon the interaction of supply and demand. For example, if demand for nursing services increases while supply remains stagnant or decreases, this will place upward pressure on nurse wages. Rising wages would “increase the number of new graduates, increase employment participation rates, and delay retirement for some nurses,” thereby increasing overall nurse supply.<sup>204</sup>

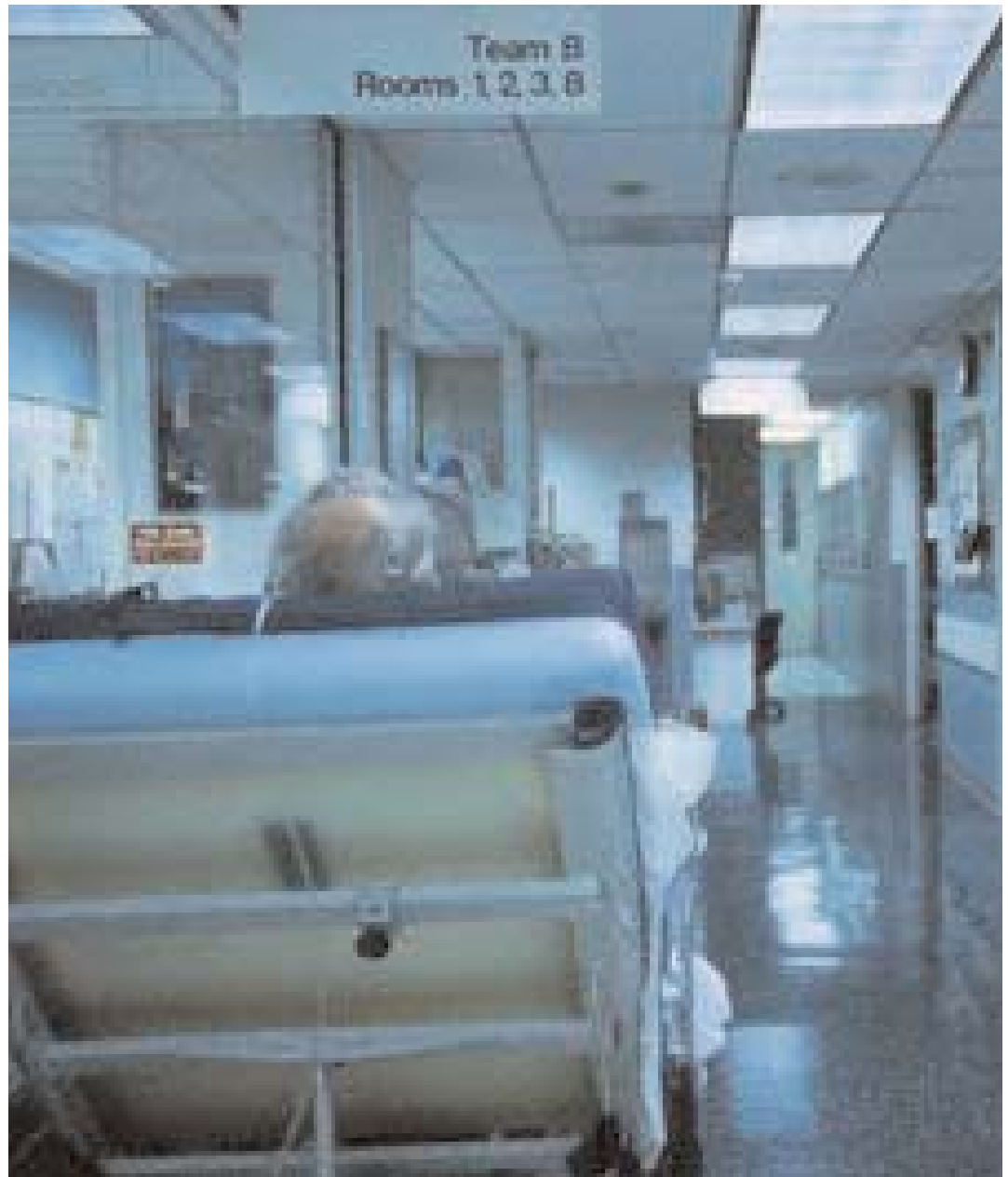
Another limitation of the NSM and the NDM is that not all of the complexities of nurse supply and demand are captured by the models. For example, the NDM has “limited ability to model substitution between types of nurses and other healthcare workers.”<sup>205</sup> Employee substitution has the potential to increase or decrease the demand for nursing services. Using RNs to fill physician roles leads to an increase in the demand for nurses, while using patient care technicians in place of RNs leads to a decrease in the demand for nurses.

# Appendix F:

## PANDEMIC FLU AND HOSPITAL BEDS SCENARIO METHODOLOGY

The estimates for hospitalizations and bed capacity rely on a program developed by the CDC, “FluSurge2.0 Beta Test Software.”<sup>206</sup> Three factors primarily determine the likelihood that a state exceeds surge capacity: (1) the number of hospitalizations; (2) the number of hospital beds; and (3) the percentage of unoccupied beds.

The number of hospitalizations depends on the severity of the strain and state age demographics. The CDC assumes that persons 65 and older are far more likely to require hospitalizations from a flu pandemic than younger individuals. Thus, states with higher proportional elderly populations (such as Florida and Pennsylvania) have more relative hospitalizations than states with a younger population mix (such as Alaska and Georgia).<sup>207</sup>



## States Surge Capacity in a “Minor” Flu Pandemic Scenario, Based on the 1968 Pandemic Outbreak

The chart below contains the hospital bed capacity that would be reached within two weeks of a mild flu pandemic, based on the FluSurge model program

States that have surge capacity to meet the number of hospital beds that would be needed within two weeks of a mild pandemic flu outbreak.

State that does NOT have surge capacity to meet the number of hospital beds that would be needed within two weeks of a mild pandemic flu outbreak.

State	% of capacity within two weeks	State	% of capacity within two weeks
Alabama	38%	Delaware	158%
Alaska	41%		
Arizona	79%		
Arkansas	34%		
California	74%		
Colorado	66%		
Connecticut	98%		
D.C.	30%		
Florida	52%		
Georgia	49%		
Hawaii	72%		
Idaho	43%		
Illinois	49%		
Indiana	38%		
Iowa	34%		
Kansas	29%		
Kentucky	35%		
Louisiana	31%		
Maine	48%		
Maryland	91%		
Massachusetts	80%		
Michigan	55%		
Minnesota	49%		
Mississippi	25%		
Missouri	40%		
Montana	32%		
Nebraska	28%		
Nevada	81%		
New Hampshire	59%		
New Jersey	75%		
New Mexico	60%		
New York	68%		
North Carolina	60%		
North Dakota	23%		
Ohio	45%		
Oklahoma	39%		
Oregon	67%		
Pennsylvania	52%		
Rhode Island	92%		
South Carolina	67%		
South Dakota	22%		
Tennessee	36%		
Texas	47%		
Utah	53%		
Vermont	55%		
Virginia	67%		
Washington	69%		
West Virginia	34%		
Wisconsin	50%		
Wyoming	26%		
Wyoming	52%		

\*Estimates rely on FluSurge2.0 Beta Test Software, created by the CDC and available at <http://www.cdc.gov/flu/flusurge.htm>. The data above are based on a “mild” pandemic outbreak, with the severity similar to the experience in 1968, where the duration lasts eight weeks with an attack rate of 25 percent. The estimates above hold all FluSurge assumptions constant, other than the hospitalization rate, which doubles. Data for the age demographics are from the Census Bureau’s Current Population Survey, 2005, available at <http://dataferrett.census.gov/>. 2004 total hospital bed data are from Kaiser Family Foundation’s State Health Facts, available at <http://www.statehealthfacts.org/cgi-bin/healthfacts.cgi>. 2003 Hospital bed occupancy rates are from the CDC.

## States Surge Capacity in a “Severe” Flu Pandemic Scenario, Based on the 1918 Pandemic Outbreak

**The chart below contains the hospital bed capacity that would be reached within two weeks of a severe flu pandemic, based on the FluSurge model program**

States that have surge capacity to meet the number of hospital beds that would be needed within two weeks of a severe pandemic flu outbreak.

States that do NOT have surge capacity to meet the number of hospital beds that would be needed within two weeks of a severe pandemic flu outbreak.

State	% of capacity within two weeks	State	% of capacity within two weeks
Mississippi	99%	Alabama	153%
North Dakota	90%	Alaska	164%
South Dakota	88%	Arizona	316%
		Arkansas	135%
		California	297%
		Colorado	264%
		Connecticut	393%
		Delaware	437%
		D.C.	121%
		Florida	209%
		Georgia	197%
		Hawaii	286%
		Idaho	170%
		Illinois	197%
		Indiana	152%
		Iowa	135%
		Kansas	117%
		Kentucky	140%
		Louisiana	125%
		Maine	192%
		Maryland	362%
		Massachusetts	320%
		Michigan	218%
		Minnesota	195%
		Missouri	158%
		Montana	127%
		Nebraska	111%
		Nevada	325%
		New Hampshire	235%
		New Jersey	301%
		New Mexico	239%
		New York	272%
		North Carolina	238%
		Ohio	179%
		Oklahoma	155%
		Oregon	268%
		Pennsylvania	208%
		Rhode Island	368%
		South Carolina	268%
		Tennessee	144%
		Texas	187%
		Utah	210%
		Vermont	221%
		Virginia	268%
		Washington	274%
		West Virginia	135%
		Wisconsin	200%
		Wyoming	104%

*\*Estimates rely on FluSurge2.0 Beta Test Software, created by the CDC and available at <http://www.cdc.gov/flu/flusurge.htm>. The data above are based on a “severe” pandemic outbreak, with the severity considered to be similar to the 1918 pandemic outbreak, which in this model, is considered to be four times the severity of the 1968 outbreak. The other default settings in this model assume a mild pandemic, similar to the experience in 1968, where the duration lasts eight weeks with an attack rate of 25 percent. The estimates above hold all assumptions constant, other than the hospitalization rate, which doubles. A major pandemic like the 1918 strand would quadruple the estimated hospitalization rate. Data for the age demographics are from the Census Bureau’s Current Population Survey, 2005, available at <http://dataferrett.census.gov/>. 2004 total hospital bed data are from Kaiser Family Foundation’s State Health Facts, available at <http://www.statehealthfacts.org/cgi-bin/healthfacts.cgi>. 2003 Hospital bed occupancy rates are from the CDC.*

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1707 H Street, NW, 7th Floor  
Washington, DC 20006  
(t) 202-223-9870  
(f) 202-223-9871