

Public Health Preparedness in a Reforming Health System

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INTRODUCTION

The 2009–2010 H1N1 novel influenza A pandemic revealed serious underlying gaps in our nation's ability to respond to public health emergencies.¹ H1N1 is the latest in a string of public health crises Americans have faced in the past decade, which have included a nationwide food-borne disease outbreak in June and July of 2008, natural disasters like the California wildfires in August 2007 and Hurricanes Katrina and Rita in 2005, and man-made disasters including the terror attacks of September 11, 2001 and the anthrax mailings in October of the same year. These public health emergencies have tested our nation's ability to respond to threats.

Health officials and emergency planners define a public health emergency as any event that has the potential to overwhelm a jurisdiction's ability to handle the resulting health consequences.² To strengthen our nation's ability to respond to public health emergencies, we must reexamine the role of the U.S. public health system. Regardless of the recent passage of health reform legislation (the Patient Protection and Affordable Care Act³), the health delivery and public health systems are continually modernizing, and we must take advantage of opportunities to build prevention, preparedness, and response into our nation's public health and health care systems.⁴

A cornerstone of public health emergency preparedness is community resilience: the notion that healthy, well-connected communities are better prepared to both weather public health emergencies and recover from their

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¹ JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, READY OR NOT? PROTECTING THE PUBLIC'S HEALTH FROM DISEASES, DISASTERS, AND BIOTERRORISM 3 (2009), available at <http://healthyamericans.org/reports/bioterror09/pdf/TFAHReadyorNot200906.pdf>.

² Christopher Nelson et al., *Conceptualizing and Defining Public Health Emergency Preparedness*, 97 AM. J. PUBLIC HEALTH S1, S9–11 (2007).

³ Patient Protection and Affordable Care Act, Pub. L. No. 111-148, 124 Stat. 119 (2010).

⁴ See Rebecca Katz & Jeffrey Levi, *Should a Reformed System be Prepared for Public Health Emergencies, and What Does That Mean Anyway?*, 36 J.L. MED. & ETHICS 716, 720 (2008).

aftermath. As detailed in the new U.S. National Health Security Strategy, public health emergency preparedness is

built on a foundation of community resilience—healthy individuals, families, and communities with access to health care and with the knowledge and resources to know what to do to care for themselves and others in both routine and emergency situations. . . . Community resilience is not possible without strong and sustainable public health, health care, and emergency response systems.⁵

This level of community resilience requires a public health system that can protect us from threats to our health and prevent disease. A prepared system must have the workforce, technology, and equipment to detect emerging pathogens, respond to disease outbreaks like H1N1, respond to natural disasters and acts of terrorism, protect our food and water supplies, immunize our population, help prevent disease, and communicate and work with at-risk populations.

Comprehensive health reform presents a rare opportunity to further strengthen our nation. However, even with health reform, there are still major gaps in our public health preparedness. Addressing these underlying weaknesses in our health system will not be easy or cheap, but failure to address these concerns could prove extremely costly.

I. BACKGROUND

To help strengthen America's defenses, the U.S. Department of Health and Human Services (HHS) has invested billions of dollars over the past several years in pandemic and all-hazards preparedness efforts at state and local health departments and hospitals.⁶ These investments in America's public health emergency preparedness and response capabilities have led to major improvements in our nation's readiness for an outbreak or emergency. Among other improvements, these efforts have increased the country's vaccine manufacturing capacity, contributed to a more robust stockpile of antiviral medications, upgraded laboratories and surveillance systems, and assisted in the development of federal, state, and local preparedness plans around the country.⁷ As a result, the country was much more prepared to respond to the H1N1 outbreak than it would have been just a few years ago.

⁵ Kathleen Sebelius, *Preface* to U.S. DEP'T OF HEALTH & HUMAN SERVS., NATIONAL HEALTH SECURITY STRATEGY OF THE UNITED STATES OF AMERICA (2009), available at <http://www.hhs.gov/aspr/opsp/nhss/nhss0912.pdf>.

⁶ See, e.g., CTNS. FOR DISEASE CONTROL & PREVENTION, DEP'T OF HEALTH & HUMAN SERVS., JUSTIFICATION OF ESTIMATES FOR APPROPRIATION COMMITTEES 366 (2010), available at http://www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2010_CDC_CJ_Final.pdf; Flu.gov, Grants to States and Territories, July 2009, http://www.flu.gov/wherelyoulive/flugrants_20090710.html (on file with the Harvard Law School Library).

⁷ See LEVI ET AL., *supra* note 1, at 55–57.

However, the H1N1 outbreak also vividly demonstrated the existing gaps in public health preparedness. Although Mexican health authorities first began investigating an unusual flu outbreak in early April 2009, it was not until April 24 that pandemic preparedness officials at HHS learned of this development.⁸ While researchers were quickly able to identify and isolate the novel influenza virus,⁹ outdated technologies led to delays in the development and production of the H1N1 vaccine, which disrupted the national mass vaccination campaign.¹⁰ When health departments were able to get their hands on the H1N1 vaccine, unprecedented demand among at-risk populations, coupled with vaccine shortages and public health workforce cuts, meant that state and local jurisdictions had difficulties staffing and running H1N1 clinics.¹¹ Patients with flu-like symptoms and those worried about their health flooded doctors' offices, ambulatory care clinics, and hospitals, leaving the institutions struggling with the surge.¹²

Decades of chronic underfunding of public health¹³ meant that many of the core systems that would have been invaluable during the H1N1 emergency were not at-the-ready when the virus emerged. The billions of dollars invested in preparedness were injected into a crumbling infrastructure. During the H1N1 crisis, Congress and the Obama Administration provided supplemental band-aid funds to respond to the crisis, but these funds were largely dedicated to immediate needs, like vaccine purchasing and distribution, and were not sufficient to address underlying gaps, such as hiring dedicated staff to track, monitor, and respond to the pandemic or updating electronic surveillance systems for tracking and sharing information.¹⁴

The current economic climate has also challenged the public health system's response to the spring and fall waves of H1N1. As a result, state and local health departments around the country were forced to do more with less during the outbreak. According to an analysis from the Center on Budget and Policy Priorities, states are facing a shortfall of \$196 billion between what they budgeted and the actual state revenues. This gap represents more than one-quarter of state budgets in fiscal year (FY) 2010¹⁵ and comes

⁸ David Brown, *System Set Up After SARS Epidemic Was Slow to Alert Global Authorities*, WASH. POST, Apr. 30, 2009, at A1.

⁹ See Jon Cohen, *Behind the Scenes: Navy Researchers Helped Spot Swine Flu in the United States*, SCIENCE INSIDER, Apr. 25, 2009, <http://news.sciencemag.org/scienceinsider/2009/04/behind-the-scen.html> (on file with the Harvard Law School Library).

¹⁰ Betsy McKay & Jeanne Whalen, *Delay Undercuts H1N1 Vaccine Campaign*, WALL ST. J., Oct. 17, 2009, at A4.

¹¹ See Betsy McKay, *Triage: Flu Outbreak Saps Public Health Resources*, WALL ST. J., Dec. 10, 2009, at A21.

¹² See Donna St. George, *Flu Brings Deluge of Worry, Wait*, WASH. POST, Nov. 17, 2009, at B1.

¹³ JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, BLUEPRINT FOR A HEALTHIER AMERICA: MODERNIZING THE FEDERAL PUBLIC HEALTH SYSTEM TO FOCUS ON PREVENTION AND PREPAREDNESS I (2008), available at <http://healthyamericans.org/assets/files/Blueprint.pdf>.

¹⁴ LEVI ET AL., *supra* note 1, at 66.

¹⁵ The 2010 state fiscal year began July 1, 2009 and continues through June 30, 2010.

on the heels of a \$109.9 billion gap between budget and revenue amounts in FY 2009.¹⁶ The economic recession has stressed a system that was already weakened by decades of underfunding, as documented in repeated assessments by HHS,¹⁷ the Institute of Medicine (IOM),¹⁸ the U.S. Centers for Disease Control and Prevention (CDC),¹⁹ and other organizations.²⁰ The gaps in infrastructure have hampered the nation's ability to respond to the H1N1 outbreak as effectively and quickly as possible. A key lesson learned from the outbreak is that until the infrastructure is strengthened, shortcomings in the core public health system will always leave the country unnecessarily vulnerable to emerging threats.

Public health emergency preparedness effectors must be prepared to handle a broad array of threats beyond diseases such as H1N1. A January 2010 report from the bipartisan Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism (WMD Commission) found that the U.S. government is not taking the necessary steps to protect the country from the threats posed by WMDs and terrorism, especially with respect to developing rapid response capabilities to prevent mass casualties.²¹

In this article we attempt to lay out our vision of a prepared health system. We identify ten essential goals of public health preparedness:

1. Focus on Disease Prevention and Health Promotion
2. Build Community Resilience
3. Address Health Disparities
4. Improve Coverage and Access
5. Fully Vaccinate the Population
6. Rebuild and Modernize Public Health Infrastructure
7. Finance Health System Preparedness
8. Develop Crisis Standards of Care
9. Implement Robust Health Information Technology Systems
10. Implement a Widely Used, Reliable Telehealth System

¹⁶ ELIZABETH McNICHOL & NICHOLAS JOHNSON, CTR. ON BUDGET & POL'Y PRIORITIES, RECESSON CONTINUES TO BATTER STATE BUDGETS; STATE RESPONSES COULD SLOW RECOVERY 10 (2010), *available at* <http://www.cbpp.org/files/9-8-08sfp.pdf>.

¹⁷ See U.S. DEP'T OF HEALTH & HUMAN SERVS., THE PUBLIC HEALTH WORKFORCE: AN AGENDA FOR THE 21ST CENTURY 3 (1997), *available at* <http://www.health.gov/phfunctions/pubhlth.pdf>.

¹⁸ INST. OF MED. OF THE NAT'L ACADS., THE FUTURE OF THE PUBLIC'S HEALTH IN THE 21ST CENTURY 98–101 (2003); INST. OF MED. OF THE NAT'L ACADS., THE FUTURE OF PUBLIC HEALTH 180–81 (1988).

¹⁹ CTRS. FOR DISEASE CONTROL & PREVENTION, DEP'T HEALTH & HUMAN SERVS., PUBLIC HEALTH'S INFRASTRUCTURE: EVERY HEALTH DEPARTMENT FULLY PREPARED; EVERY COMMUNITY BETTER PROTECTED 3 (2001), *available at* <http://www.uic.edu/sph/prepare/courses/ph410/resources/phinfrastructure.pdf>.

²⁰ LEVI ET AL., *supra* note 13, at 13–17.

²¹ COMM'N ON THE PREVENTION OF WEAPONS OF MASS DESTRUCTION PROLIFERATION & TERRORISM, PREVENTION OF WMD PROLIFERATION AND TERRORISM REPORT CARD 2 (2010), *available at* <http://www.preventwmd.gov/static/docs/report-card.pdf>.

We then examine how these issues can be addressed within a reforming health system. In some cases, there is a clear need for a legislative fix, while in other cases we argue that public health practices and procedures must reform and adapt to meet these needs.

II. WHAT DOES A PREPARED PUBLIC HEALTH SYSTEM LOOK LIKE?

Amidst the continuing national debate over comprehensive health reform, we have identified ten issues that affect our nation's ability to prepare for and respond to public health emergencies. Congress and the Obama Administration must address these issues in order to enhance the nation's ability to respond to health emergencies, whether they are man-made threats like a terrorist bombing or bioattack, infectious disease outbreaks like H1N1, or natural disasters. The new health reform law is one vehicle to do so. However, the essential components of a prepared health system need to be considered regardless of the implementation of the new law.

1. Focus on Disease Prevention and Health Promotion

Americans cannot be prepared if they are already unhealthy, yet national chronic disease rates are spiraling out of control. More than two-thirds of American adults are overweight or obese.²² One in three has one or more types of cardiovascular disease.²³ Nearly 24 million Americans have type 2 diabetes and another 57 million are prediabetic.²⁴ These underlying health conditions pose a challenge when residents are asked to evacuate due to a public health emergency. We have seen during the H1N1 pandemic that those with chronic conditions are more at risk for complications.²⁵ Persons dependent on prescription drugs also face challenges when asked to evacuate or shelter-in-place as they may run out of medicines.²⁶

Given the high prevalence of chronic conditions in this country, increased emphasis on prevention and wellness has the potential to affect public health preparedness. Evidence from Hurricane Katrina illustrates that many in the evacuee population displaced to shelters struggled with a signif-

²² NAT'L CTR. FOR HEALTH STATISTICS, HEALTH, UNITED STATES, 2009: WITH SPECIAL FEATURE ON MEDICAL TECHNOLOGY 292 (2009), available at <http://www.cdc.gov/nchs/data/hus/hus09.pdf#067>.

²³ Donald Lloyd-Jones et al., *Heart Disease and Stroke Statistics 2009 Update*, CIRCULATION 480/e21, e31 (2009), available at <http://circ.ahajournals.org/cgi/reprint/119/3/e21>.

²⁴ CTRS. FOR DISEASE CONTROL & PREVENTION, NATIONAL DIABETES FACT SHEET 2007, at 4–5 (2008), available at http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2007.pdf.

²⁵ E.g., Ctrs. for Disease Control & Prevention, *People at High Risk of Developing Flu-Related Complications* (Nov. 10, 2009), <http://www.cdc.gov/h1n1flu/highrisk.htm> (on file with the Harvard Law School Library).

²⁶ See, e.g., D. W. Brown et al., *Evidence-based Approach for Disaster Preparedness Authorities to Inform the Contents of Repositories for Prescription Medications for Chronic Disease Management and Control*, 23 PREHOSPITAL & DISASTER MED. 447, 448 (2008).

icant burden of disease.²⁷ In one study of those displaced by Hurricane Katrina, researchers found that 55.6% had a chronic disease, with hypertension, hypercholesterolemia, diabetes, and pulmonary disease as the most common chronic conditions.²⁸ During Hurricanes Gustav and Ike, 40% of evacuees were obese, and many of those individuals were unable to stay in local shelters because of their condition.²⁹ A similar problem occurred in the Iowa floods of 2008 when many people who were morbidly obese or on oxygen were unable to stay at local shelters.³⁰ Instead, these individuals had to stay in hospitals—taking up available beds that might have been needed for acute emergency cases.³¹

Caring for evacuees who are obese or afflicted with one or more chronic diseases increases the resources needed at each shelter to prevent further morbidity and mortality. If we can significantly reduce the levels of disease among Americans, it stands to reason that this will help increase our resilience and improve our nation's ability to respond to public health emergencies.

According to CDC, the majority of chronic diseases could be prevented through lifestyle and environmental changes.³² Therefore, a new national health strategy that emphasizes community prevention and preventive care and services is crucial. While individual choices are an important part of staying healthy, research has also shown that many factors beyond individual control contribute to personal health. People do not make decisions in vacuums. Factors such as the high costs of healthy foods, the location of grocery stores, and access to safe places to exercise can limit individual choice.

Community prevention programs help to make healthy choices easier choices.³³ For instance, the Shape Up Somerville program in Somerville, Massachusetts aims to prevent obesity in high-risk elementary school children by increasing their physical activity options and improving dietary choices. The program targets environmental and policy changes at the school and community levels and has been shown to be effective at reducing

²⁷ See generally P. Gregg Greenough et al., *Burden of Disease and Health Status Among Hurricane Katrina-Displaced Person in Shelters*, 51 ANNALS OF EMERGENCY MED. 426 (2008).

²⁸ *Id.* at 430.

²⁹ Richard Besser, Remarks at the 2008 CDC Conference on Emergency Preparedness and Response, Panel on CDC's Role in Public Health Preparedness (Oct. 6, 2008) (notes on file with authors).

³⁰ Patricia Quinlisk, Remarks at the 2008 CDC Conference on Emergency Preparedness and Response, Panel on CDC's Role in Public Health Preparedness (Oct. 6, 2008) (notes on file with authors).

³¹ *Id.*

³² CTRS. FOR DISEASE CONTROL & PREVENTION, DEP'T OF HEALTH & HUMAN SERVS., THE BURDEN OF CHRONIC DISEASES AND THEIR RISK FACTORS, at x (2004), available at http://www.cdc.gov/NCCDPHP/burdenbook2004/pdf/burden_book2004.pdf.

³³ See JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, PREVENTION FOR A HEALTHIER AMERICA 3 (2009), available at <http://healthyamericans.org/reports/prevention08/Prevention08.pdf>.

body mass index (BMI) among the target population.³⁴ According to an analysis by the Urban Institute, community-based prevention programs like Shape Up Somerville do not increase health care costs and have been shown to reduce health spending within short time periods.³⁵ Community-based prevention programs can also have “spillover effects on local quality of life and economic vitality” in communities.³⁶

Congress has made an initial down payment on community prevention through the 2009 American Recovery and Reinvestment Act (ARRA), which provides an unprecedented increased investment for revitalizing and modernizing the public health system.³⁷ The ARRA funding will result in a one-time additional investment of \$1 billion for public health programs around the country. The ARRA funding will be used to carry out evidence-based clinical programs and community-based prevention and wellness strategies that deliver specific, measurable health outcomes that address chronic disease rates. The \$1 billion for prevention and wellness efforts will be distributed as follows:

- \$650 million for chronic disease prevention via policies and programs to increase physical activity, improve nutrition, decrease obesity, and decrease smoking;³⁸
- \$300 million for Section 317 immunization programs;³⁹ and
- \$50 million to support states in the prevention and reduction of health care associated infections (HAI).⁴⁰

A key aspect of the health reform legislation is an emphasis on community-based prevention and the coverage of clinical prevention and management of chronic diseases, which has the potential to improve the health of Americans across the nation.

2. *Build Community Resilience*

These community-based prevention programs create community resilience by improving the health outcomes of residents and by helping to build

³⁴ Christina D. Economos et al., *A Community Intervention Reduces BMI Z-Score in Children: Shape Up Somerville First Year Results*, 15 *OBESITY* 1325, 1332–34 (2007).

³⁵ Barbara Ormond et al., *Maximizing the Stimulus Effect of Prevention Activities*, in *BIGGEST BANG FOR THE BUCK: RESEARCHERS WEIGH STIMULUS PROPOSALS*, <http://www.urban.org/issues/recovery.cfm#ormond> (on file with the Harvard Law School Library).

³⁶ *Id.*

³⁷ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-15, 123 Stat. 115.

³⁸ News Release, U.S. Dep’t of Health & Human Servs., HHS Secretary Sebelius Announces Cornerstone Funding of the \$650 Million Recovery Act Community Prevention and Wellness Initiative (Sept. 17, 2009), *available at* <http://www.hhs.gov/news/press/2009pres/09/20090917a.html>.

³⁹ U.S. Dep’t of Health & Human Servs., Immunization Grant Program, <http://www.hhs.gov/recovery/programs/cdc/immunizationgrant.html> (on file with the Harvard Law School Library).

⁴⁰ Ctrs. for Disease Control & Prevention, Healthcare-Associated Infections: Recovery Act, <http://www.cdc.gov/HAI/recoveryact/index.html> (on file with the Harvard Law School Library).

relationships among neighbors, community- and faith-based organizations, health officials, health care providers, and government agencies. One example is the Healthy Eating, Active Communities (HEAC) program that brings together community residents and public institutions and works with local government and private businesses in an effort to prevent childhood obesity.⁴¹ An evaluation of the first four years of the program has shown not only that neighborhood environments are changing, but also that grantees are deeply immersed in policy and institutional activities.⁴² The evaluation report notes that community members have “used nutrition and physical activity as a vehicle for addressing broader community issues, such as economic disparities, targeted junk food advertising, and community safety[, and] have formed relationships with elected officials, who are themselves now advocates for the changes HEAC promotes.”⁴³

Public health departments can play a critical role in building community resilience. In particular, state and local public health departments can create strategies to work with at-risk communities on a range of ongoing health concerns, including emergency preparedness. These public health professionals often have existing relationships with community- and faith-based organizations with ties to at-risk populations. By coordinating and developing relationships with these organizations, public health departments are able to effectively disseminate targeted messages and strengthen community resilience.

3. *Address Health Disparities*

As we think about community resilience—and how it enhances our nation’s ability to respond to and recover from a disaster—we cannot ignore the persistent health disparities in the United States. Lower-income and minority communities systemically have higher exposure to health threats and worse health outcomes, which place them at increased risk for severe outcomes in a public health emergency. For example, unequal access to routine vaccines could predict disparities in receiving medical countermeasures during an infectious disease outbreak.

In 2008, for instance, 70% of older non-Hispanic whites received the influenza vaccination, whereas only 51% and 56% of older African Americans and Hispanics, respectively, received the vaccination.⁴⁴ There were even greater disparities for pneumococcal vaccination coverage. In 2008, vaccination rates were 65% for non-Hispanic whites, compared to 45% for

⁴¹ Healthy Eating, Active Communities Home Page, <http://www.healthyeatingactivecommunities.org/index.php> (on file with the Harvard Law School Library).

⁴² SARAH E. SAMUELS ET AL., HEALTHY EATING, ACTIVE COMMUNITIES: PHASE I EVALUATION FINDINGS 2005–2008, at 7 (2008), available at <http://samuelsandassociates.com/samuels/upload/ourlatest/HEACEvalFINAL.pdf>.

⁴³ *Id.* at 41.

⁴⁴ Office of Minority Health, U.S. Dep’t of Health & Human Servs., Immunizations Data/Statistics, <http://www.minorityhealth.hhs.gov/templates/browse.aspx?v1=3&lvlid=60> (on file with the Harvard Law School Library).

African Americans and 37% for Hispanics.⁴⁵ Some of these disparities are attributable to unequal access to health care.⁴⁶ These health disparities leave communities more vulnerable to events that cause health emergencies. Even before Hurricane Katrina, Gulf Coast populations—many of them lower-income minorities—were among the most chronically ill in the nation.⁴⁷

As the health system reforms and modernizes, some disparities may be addressed. However, health disparities among lower-income and minority populations will not disappear overnight. For example, if the shortage of primary care providers persists, it is likely to affect minority and lower-income communities disproportionately. After Massachusetts enacted health care reform in 2006, primary care providers and community health centers experienced a great increase in demand among medically underserved, lower-income communities.⁴⁸

The issue of undocumented immigrants must also be addressed. An estimated 12 million undocumented immigrants live and work in the United States, where they make up 4% of the population and 5.4% of the workforce.⁴⁹ They are significantly more likely than U.S. citizens to be uninsured, and they are prohibited from enrolling in federal insurance plans for the poor, like Medicaid or the Children's Health Insurance Program (CHIP).⁵⁰

A crucial component of controlling the spread of infectious diseases is early identification and treatment. However, it may be very difficult to do so if undocumented immigrants are uninsured or afraid to access what health care is available to them through community health centers, clinics, and public hospitals. In addition, placing barriers to accessing regular health care in the way of undocumented immigrants threatens community resilience be-

⁴⁵ Office of Minority Health, U.S. Dep't of Health & Human Servs., Immunizations and African Americans, <http://www.minorityhealth.hhs.gov/templates/content.aspx?lvl=3&lvlID=60&ID=3020> (on file with the Harvard Law School Library); Office of Minority Health, U.S. Dep't of Health & Human Servs., Immunizations and Hispanic Americans, <http://www.minorityhealth.hhs.gov/templates/content.aspx?lvl=3&lvlID=60&ID=3328> (on file with the Harvard Law School Library).

⁴⁶ See generally ANNE C. BEAL ET AL., THE COMMONWEALTH FUND, CLOSING THE DIVIDE: HOW MEDICAL HOMES PROMOTE EQUITY IN HEALTH CARE (2007), available at <http://www.commonwealthfund.org/Content/Publications/Fund-Reports/2007/Jun/Closing-the-Divide—How-Medical-Homes-Promote-Equity-in-Health-Care—Results-From-The-Commonwealth-F.aspx>; Rick Hong et al., *The Emergency Department for Routine Healthcare: Race/Ethnicity, Socioeconomic Status, and Perceptual Factors*, 32 J. EMERGENCY MED. 149 (2007); The Henry J. Kaiser Fam. Found., *Uninsured Rates for the Nonelderly by Race/Ethnicity, States (2007–2008)*, U.S. (2008), <http://statehealthfacts.org/comparatable.jsp?ind=143&cat=3> (on file with the Harvard Law School Library).

⁴⁷ See Hurricane Katrina Cmty. Advisory Group & Ronald C. Kessler, *Hurricane Katrina's Impact on the Care of Survivors with Chronic Medical Conditions*, 22 J. GEN. INTERNAL MED. 1225, 1228 (2007).

⁴⁸ Richard E. Rieselbach et al., *Teaching Primary Care in Community Health Centers: Addressing the Primary Care Workforce Crisis for the Underserved*, 152 ANNALS INTERNAL MED. 118, 121 (2009).

⁴⁹ THE HENRY J. KAISER FAM. FOUND., IMMIGRANTS' HEALTH COVERAGE AND HEALTH REFORM 1 (2009), available at <http://www.kff.org/healthreform/upload/7982.pdf>.

⁵⁰ *Id.*

cause those with health conditions are more vulnerable to severe effects from a disease outbreak or public health emergency. This political decision could have serious consequences for our nation's health security, especially in the event of another pandemic or bioterrorist attack.

4. *Improve Coverage and Access*

The ability to access routine and emergency health care is crucial to preparedness. According to the Congressional Budget Office (CBO), without the recent health care reform, 54 million Americans would have been without health insurance coverage by 2019.⁵¹ Even with the implementation of health reform, CBO estimates that 23 million nonelderly Americans will remain uninsured by 2019.⁵² As coverage improves, ensuring ongoing access to care and financing will be necessary to preserve the solvency of our health care system during a disaster.

Surge capacity, or the ability for a health facility to expand services to meet the excess demand resulting from a disaster, remains a weakness in our nation's capacity to respond to an emergency. Ensuring adequate reimbursement is an important aspect of meeting this increased demand. A major disaster places the solvency of the health care system under threat in a reforming health system, due to the costs of uncompensated care from a surge of uninsured, underinsured, or out-of-network patients. Even during a relatively moderate pandemic, such as the 2009 H1N1 outbreak, hospitals and ambulatory health facilities were stretched by an influx of sick patients and the "worried well."⁵³ According to one model, a severe influenza pandemic, like the 1918 pandemic that killed as many as 100 million people worldwide,⁵⁴ could cause U.S. hospitals to lose an estimated \$3.9 billion, or over \$784,000 per hospital.⁵⁵ This estimate was based on losses due to uncompensated care and deferred elective procedures. Reducing the number of uninsured before a disaster hits significantly reduces the burden on hospitals when accepting a surge of patients and on states that bear uncompensated care costs when receiving evacuees.

Further, improved coverage will remove barriers to seeking treatment for uninsured individuals who fear out-of-pocket costs during a disaster. Particularly for lower-income patients, evidence shows that cost sharing is a

⁵¹ Cong. Budget Office, Director's Blog, Insurance Coverage Under the Health Care Reform Proposal Approved by the Senate Finance Committee (Oct. 25, 2009), <http://cboblog.cbo.gov/?p=397> (on file with the Harvard Law School Library).

⁵² Cong. Budget Office, Director's Blog, Cost Estimate for Pending Health Care Legislation (Mar. 21, 2010), <http://cboblog.cbo.gov/?cat=5> (on file with the Harvard Law School Library).

⁵³ See Steve Sternberg, *H1N1 Flu 'Pushing Hospitals to Their Limit'*, USA TODAY, Oct. 27, 2009, at A1.

⁵⁴ Jeffery K. Taubenberger & David M. Morens, *1918 Influenza: The Mother of All Pandemics*, 12 EMERGING INFECTIOUS DISEASES 15, 15 (2006).

⁵⁵ See Jason Matheny et al., *Financial Effects of an Influenza Pandemic on US Hospitals*, 34 J. HEALTH CARE FIN. 58, 58 (2007).

significant barrier to accessing health care.⁵⁶ Particularly during an infectious disease outbreak, compliance with recommendations to seek immediate care may be critical to quickly identify and contain the spread of a disease.⁵⁷ For example, during the recent H1N1 outbreak, antivirals were most effective if given within the first forty-eight hours after onset of symptoms.⁵⁸ Therefore, a delay in treatment due to financial concerns could greatly exacerbate a patient's disease.

Improving coverage and access to primary care will also reduce the burden on emergency departments (EDs) under nondisaster circumstances and allow for a faster ramp-up during a catastrophe. Rather than seeking primary and intermediate care in emergency departments, individuals who are currently uninsured or disconnected from the health care system will have increased access to primary and preventive care.⁵⁹ With these individuals no longer overcrowding EDs, hospitals will be better positioned to focus on triage and treatment of the crisis patients during a disaster.

5. Fully Vaccinate the Population

A more prepared public health structure is one that includes an effective vaccine delivery system. Such a system should be able to provide vaccines to prevent routine infectious diseases, such as seasonal influenza or the measles, as well as the rapid mass vaccinations required by a pandemic, bioterror attack, or emerging infectious disease outbreak.

A fully immunized population is essential to control the spread of infectious diseases—a key aspect of public health preparedness. For example, successful widespread vaccine programs in the United States have led to the eradication of polio and smallpox.⁶⁰ Expansion of vaccination programs to target the 40,000 to 50,000 adults who die annually from vaccine-preventable diseases in the United States would help boost our nation's resilience.⁶¹ In addition, by vaccinating more Americans, we would ensure a market for

⁵⁶ See JULIE HUDMAN & MOLLY O'MALLEY, THE HENRY J. KAISER FAM. FOUND., HEALTH INSURANCE PREMIUMS AND COST-SHARING: FINDINGS FROM THE RESEARCH ON LOW-INCOME POPULATIONS 6–7 (2003), available at <http://www.kff.org/medicaid/upload/Health-Insurance-Premiums-and-Cost-Sharing-Findings-from-the-Research-on-Low-Income-Populations-Policy-Brief.pdf>.

⁵⁷ See generally Press Release, Harvard Sch. Pub. Health, Many Americans Would Delay Taking Recommended Antibiotics after Anthrax Attack, Poll Finds (Feb. 19, 2010), available at <http://www.hsph.harvard.edu/news/press-releases/2010-releases/poll-anthrax-delay-antibiotics.html>.

⁵⁸ See Ctrs. for Disease Control & Prevention, Questions & Answers: Antiviral Drugs, 2009-2010 Flu Season (Nov. 17, 2009), <http://www.cdc.gov/H1N1flu/antiviral.htm> (on file with the Harvard Law School Library).

⁵⁹ A. Diamant et al., The Effect of Insurance Status and Access to Care on Public Health Patients' Use of Emergency Department Services (2001), <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102273176.html> (on file with the Harvard Law School Library).

⁶⁰ JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, ADULT IMMUNIZATIONS: SHOTS TO SAVE LIVES 2 (2010), available at <http://healthyamericans.org/assets/files/TFAH2010AdultImmunzBrief13.pdf>.

⁶¹ *Id.* at 1.

manufacturers to continue to invest in the research and development of vaccines⁶² and would reinforce the need for a system to distribute and dispense these vaccines. Increased vaccination also gets the public accustomed to receiving routine immunizations, which could reduce vaccine hesitancy during an emergency. During the recent H1N1 vaccination campaign, for example, CDC estimated that only 24% of the U.S. population had been vaccinated, including about 33% of persons in the initial target groups.⁶³ Despite the aggressive vaccination and public education campaign around H1N1, these numbers were similar to annual seasonal influenza vaccine rates.⁶⁴ The low take-up rates should be a wake-up call to public health and medical providers that vaccine acceptance remains a serious barrier to the success of a widespread immunization campaign.

Unlike children, who receive regularly scheduled vaccines before enrolling in school, our fragmented adult immunization system can overlook even insured adults. Currently, there is no meaningful system or structure in place for ensuring that adults have access to or receive the vaccines they need unless they are in the military, are part of institutions like colleges that have vaccine requirements for enrollment, or work in health care settings. The lack of a defined vaccine system, cost, ignorance of the need for vaccines, inadequate reimbursement, and spotty access to primary care all generate gaps in immunization of adults.

Today, millions of adult Americans go without routine and recommended vaccinations because our medical system is not oriented to ensure adults receive regular preventive health care.⁶⁵ The result is thousands of deaths from seasonal influenza, invasive pneumococcal disease, the adverse effects of hepatitis B, and other infectious diseases that could have been prevented each year if more adults were vaccinated.⁶⁶ CDC has estimated the direct health care burden of adult vaccine-preventable diseases at about \$10 billion annually.⁶⁷

The ongoing failure of the adult immunization system means that millions of Americans are at risk for a widespread infectious disease outbreak.⁶⁸ Support for the creation of an adult vaccine strategy has intensified follow-

⁶² See MARGARET A. HAMBURG, TRUST FOR AM.'S HEALTH, *GERMS GO GLOBAL: WHY EMERGING INFECTIOUS DISEASES ARE A THREAT TO AMERICA 1-2* (2008), available at <http://healthyamericans.org/assets/files/GermsGoGlobal.pdf>.

⁶³ Robert Roos, *CDC Estimates 24% of Americans Received H1N1 Vaccine*, CIDRAP, Apr. 1, 2010, <http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/apr0110coverage.html> (on file with the Harvard Law School Library).

⁶⁴ *Id.*

⁶⁵ LEVI ET AL., *supra* note 60, at 1.

⁶⁶ See NAT'L FOUND. FOR INFECTIOUS DISEASES, *YOU NEVER OUTGROW VACCINES: ADULT VACCINATION FACT SHEET 1* (2009), available at http://www.adultvaccination.com/doc/Patient_Fact_Sheet.pdf.

⁶⁷ *CDC Finds Low Rates of Adult Immunization*, IDSA NEWS, Jan. 2008, <http://www.id.society.org/newsArticle.aspx?id=9510> (on file with the Harvard Law School Library).

⁶⁸ See U.S. DEP'T OF HEALTH & HUMAN SERVS., *HEALTHY PEOPLE 2010*, at 42-43 (2d ed. 2000).

ing the H1N1 outbreak,⁶⁹ and awareness of the importance of vaccines as a response to biological terrorism threats like smallpox⁷⁰ and anthrax⁷¹ continues to grow. The lack of regular access to vaccines contributes to mistrust and misunderstanding surrounding the efficacy and safety of vaccines. Public health authorities were forced to counteract those doubts during the H1N1 outbreak, as some parents,⁷² individuals, and even health care workers⁷³ doubted the science behind the vaccine. When the next outbreak or bioterror attack occurs, a resilient population would be one that is accustomed to trusting and accessing vaccines.

6. *Rebuild and Modernize Public Health Infrastructure*

Public health infrastructure has been underfunded for decades, according to assessments from CDC, IOM, and other experts.⁷⁴ It is important that states have a reliable, dedicated, and sustained level of funding that is adequate to meet core capacities and to keep pace with new technologies that can help states better meet the needs of their communities. A strong public health system must be capable of meeting not only the everyday needs of the population, but also the surge in demand that an unanticipated emergency or public health threat will bring. This requires having systems in place to track and report on chronic and infectious diseases, illness, and death; distribute and dispense medical countermeasures and supplies; and communicate and mobilize people and equipment to respond to health threats.

It also requires a strong, well-trained public health workforce. Public health workers are the backbone of the U.S. public health system. They are epidemiologists who detect emerging pathogens and respond to disease outbreaks like H1N1. They are preparedness planners and coordinators who respond to natural disasters and acts of terrorism. They are environmental health specialists who protect our food and water supplies. They are nurses who immunize our children and help prevent disease.

However, the public health workforce is seriously strained by chronic underfunding and the current economic recession, which has led to hiring

⁶⁹ See Press Release, Senate Comm. on Homeland Sec. & Governmental Affairs, Senator Collins Faults Obama Administration's H1N1 Vaccine Strategy, Urges New Plan (Nov. 3, 2009), available at http://hsgac.senate.gov/public/index.cfm?FuseAction=Press.Minority.News&ContentRecord_id=bab93bfb-5056-8059-766d-ea17deba3e1d&Region_id=&Issue_id.

⁷⁰ See M. Elizabeth Halloran et al., *Containing Bioterrorist Smallpox*, 298 SCIENCE 1428, 1428 (2002).

⁷¹ See Prasith Baccam & Michael Boechler, *Public Health Response to an Anthrax Attack: An Evaluation of Vaccination Policy Options*, 5 BIOSECURITY & BIOTERRORISM: BIODEFENSE STRATEGY, PRAC., & SCI. 26, 30–33 (2007).

⁷² See Rob Stein & Jennifer Agiesta, *Despite H1N1 Fears, Many Worry About Vaccination*, WASH. POST, Oct. 22, 2009, at A8.

⁷³ See Vaughn S. Millner et al., *Examining Influenza Vaccination Coverage Among Healthcare Workers*, Poster presented at the 2010 Public Health Preparedness Summit (Feb. 17, 2010), available at <http://www.phprep.org/2010/Agenda/upload/30.pdf>.

⁷⁴ See *supra* notes 16–20 and accompanying text.

freezes, travel restrictions, and forced furloughs.⁷⁵ According to a recent survey of local health departments, 23,000 jobs have been eliminated since January 2008.⁷⁶ Another survey of state health departments found that 50% of state health officials expect to lose staff through layoffs or attrition in fiscal year 2010 (July 2009–June 2010).⁷⁷ In addition, the public health workforce is aging, and it remains unclear how agencies plan to recruit the next generation of workers.

7. *Finance Health System Preparedness*

Health system preparedness—that is, building the readiness of the health care delivery system, including hospitals, ambulatory care clinics, and doctors' offices, before a disaster occurs—is a core component of overall emergency preparedness. Health facilities must be equipped to protect their staff and patients during a disaster, to treat a surge of patients, and to continue operations under challenging circumstances.

Preparing the health care system to weather and mitigate the impacts of a disaster is a key component to building a resilient population. Currently, the only funding stream that seeks to build the capacity of hospitals to respond to a public health disaster is the Hospital Preparedness Program (HPP). HPP, a competitive grant program administered by the office of the Assistant Secretary for Preparedness Response (ASPR) at HHS, has several priorities, including communication systems, available bed tracking, personnel management, fatality management, and hospital evacuation planning.⁷⁸ This program doled out \$393.5 million in grants in FY 2009, a 28% decline since FY 2005.⁷⁹ A 2009 analysis of the program by the Center for Biosecurity at the University of Pittsburgh Medical Center found that hospital preparedness had improved significantly under HPP and that hospital administrators had increasingly become convinced of the need for hospital disaster preparedness.⁸⁰ According to the study, 13% of U.S. hospitals did not par-

⁷⁵ JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, SHORTCHANGING AMERICA'S HEALTH: A STATE-BY-STATE LOOK AT HOW FEDERAL PUBLIC HEALTH DOLLARS ARE SPENT AND KEY STATE HEALTH FACTS 15–16 (2009), available at <http://healthyamericans.org/assets/files/shortchanging09.pdf>.

⁷⁶ Press Release, Nat'l Ass'n of County & City Health Officials, New Analysis of Local Health Department Job Losses Survey Demonstrates Depth of Program Cuts (May 24, 2010), available at <http://www.naccho.org/press/releases/copy-of-0405.cfm>.

⁷⁷ ASS'N OF STATE & TERRITORIAL HEALTH OFFICIALS, IMPACT OF BUDGET CUTS ON STATE PUBLIC HEALTH 1 (2010), available at <http://www.astho.org/Research/Data-and-Analysis/ASTHO-Budget-Cuts-Survey-Results/>.

⁷⁸ U.S. Dep't of Health & Human Servs., The Hospital Preparedness Program (HPP), <http://www.hhs.gov/aspr/opeo/hpp/index.html> (on file with the Harvard Law School Library).

⁷⁹ Adjusted for 10.58% inflation over FY 2005–FY 2009.

⁸⁰ ERIC TONER ET AL., CTR. FOR BIOSECURITY OF UPMC, HOSPITALS RISING TO THE CHALLENGE: THE FIRST FIVE YEARS OF THE U.S. HOSPITAL PREPAREDNESS PROGRAM AND PRIORITIES GOING FORWARD 23–24 (2009), available at <http://www.upmc-biosecurity.org/website/resources/publications/2009/pdf/2009-04-16-hppreport.pdf>.

ticipate in the program, either because they were in rural areas, did not meet the criteria, or did not feel it was necessary.⁸¹

Given the significant role hospital preparedness planning would play during a disaster, it may be short sighted to make it dependent on discretionary funding, which is subject to the annual appropriations process, rather than mandatory funding, which is automatically allocated. Congress should consider legislation to create a mandatory funding stream to finance health system preparedness through Medicare reimbursement or other federal funding streams. Health system preparedness should be considered a public good worthy of mandatory government financing—similar to graduate medical education programs that train future physicians with the help of government funding. Hospitals tend to work on a slim margin,⁸² so without a predictable stream of funding there is little incentive for facilities to plan and develop crisis standards of care, recruit and train staff, and stockpile supplies for a disaster. Such funding would allow the government to track progress on preparedness benchmarks by health facilities—such as those identified in the HPP—and tie the hospital's reimbursement payment to reaching those benchmarks.

As our health system evolves over the next decade or so, gaps will remain, particularly in terms of health insurance coverage. One legislative proposal to tackle this possibility is the Public Health Emergency Response Act,⁸³ which would create a temporary emergency mechanism to cover uninsured individuals affected by a disaster. The legislation would allow the Secretary of HHS, after declaring a public health emergency, to activate temporary emergency health benefits for individuals who are uninsured or otherwise qualified. An emergency fund would be established to pay for these services at Medicare rates. The benefit would last for ninety days or less, though the Secretary could extend it for an additional ninety days if needed. Such a bill could help ensure fiscal solvency of a health system during a public health catastrophe and remove barriers to uninsured individuals seeking care.

8. *Develop Crisis Standards of Care*

Crisis standards of care provide a framework for the restoration of order during the chaos of a mass casualty event. In such an event, community resources—staff, supplies, and space—may very well be strained, and health care providers would face serious obstacles if they provided care to patients according to normal operating procedures. Communities that have developed, disseminated, and adopted well-thought-out crisis standards of care will be more resilient in the face of health emergencies. Developing such

⁸¹ *Id.* at 22.

⁸² DAVID KOEPKE & GARY PICKENS, CTR. FOR HEALTHCARE IMPROVEMENT, HOSPITAL OPERATIONAL AND FINANCIAL PERFORMANCE IMPROVING 2-5 (2009), available at <http://www.save4billion.com/images/HospitalOpFinPerfImprove.pdf>.

⁸³ Public Health Emergency Response Act of 2009, H.R. 2231, 111th Cong. (2009).

standards brings disparate groups of people together to address issues, including the allocation of scarce resources, ethical obligations, and legal concerns (such as health care workers' liability during a disaster), and ensures these questions are preemptively considered in an open, transparent manner.⁸⁴ If these difficult discussions are put off, decisions are often made in the spur of the moment and without any input from community members, as we saw in New Orleans during Hurricane Katrina.⁸⁵

The Institute of Medicine (IOM) defines crisis standards of care as a substantial change in usual healthcare operations and the level of care it is possible to deliver, which is made necessary by a pervasive (e.g., pandemic influenza) or catastrophic (e.g., earthquake, hurricane) disaster. This change in the level of care delivered is justified by specific circumstances and is formally declared by a state government, in recognition that crisis operations will be in effect for a sustained period. The formal declaration that crisis standards of care are in operation enables specific legal/regulatory powers and protections for healthcare providers in the necessary tasks of allocating and using scarce medical resources and implementing alternate care facility operations.⁸⁶

Providing care in such an environment is not routine for the U.S. health care system, according to the Joint Massachusetts Department of Public Health-Harvard Altered Standards of Care Working Group. While “[t]he military has traditionally upheld protocols to achieve the greatest good for the greatest number during mass casualty incidents, using well-established and accepted practices for utilitarian triage to deploy resources[,] . . . the patient-centered model of civilian medicine in the United States is much less familiar with such decision making.”⁸⁷ Indeed, following Hurricane Katrina, some patients have brought legal challenges against facilities because they failed to provide normal standards of care.⁸⁸ Many hospitals in Katrina lost power, water and sewage facilities, communications systems, and supplies

⁸⁴ The Seattle & King County Public Health Department is one example of a community that has reached out to engage a diverse group of stakeholders to discuss the challenging ethical, legal, and medical questions about allocation of medical care during an influenza pandemic. See SEATTLE & KING COUNTY, PUBLIC ENGAGEMENT PROJECT ON MEDICAL SERVICE PRIORITIZATION DURING AN INFLUENZA PANDEMIC (2009), available at <http://www.kingcounty.gov/healthservices/health/preparedness/%7e/media/health/publichealth/documents/pandemicflu/MedicalServicePrioritization.ashx>.

⁸⁵ See Sheri Fink, *Strained by Katrina, a Hospital Faced Deadly Choices*, N.Y. TIMES MAG., Aug. 25, 2009, at MM28.

⁸⁶ INST. OF MED. OF THE NAT'L ACADS., GUIDANCE FOR ESTABLISHING CRISIS STANDARDS OF CARE FOR USE IN DISASTER SITUATIONS 3 (2009).

⁸⁷ Donna Levin et al., *Altered Standards of Care During an Influenza Pandemic: Identifying Ethical, Legal, and Practical Principles to Guide Decision Making*, 3 DISASTER MED. & PUB. HEALTH PREPAREDNESS S132, S132 (2009).

⁸⁸ Bill Barrow, *Katrina Lawsuit May Set Precedent; Patient's Family Sues Methodist Hospital*, TIMES-PICAYUNE, Jan. 13, 2010, at B1.

of food, drugs, blood, and other necessities.⁸⁹ The experience of health practitioners in Haiti after the recent major earthquake is another extreme example of the need for health systems to have alternative approaches to providing care.⁹⁰

In fact, a 2008 review of crisis planning efforts at the state level revealed in some detail the major challenges states and health care systems face when developing crisis standards of care.⁹¹ Researchers at the Center for Public Health Preparedness at the Harvard School of Public Health interviewed thirty-three hospital and state preparedness coordinators and identified the following challenges: the allocation of scarce resources; health care practitioners' liability during a disaster; health care worker absenteeism; and the lack of consensus on the current guidelines for triage protocols, consistent terminology, prioritization of patients, and allocation of ventilators. It is also unclear whether states should focus on developing general guidance on how health care providers should approach crisis care, or whether specific situational guidance (for example, when to use a ventilator) is needed.

9. *Implement Robust Health Information Technology Systems*

The development of a robust, nationwide health information technology (HIT) system has the potential to assist with future public health disasters. According to HHS, HIT allows "comprehensive management of medical information and its secure exchange between health care consumers and providers."⁹² A comprehensive system should include interoperable electronic health records (EHRs) and automated communication between providers and public health departments. HIT is still nascent in the United States, but recent legislative accomplishments could catalyze widespread implementation. The most significant steps toward the advancement of HIT in the United States will likely result from the \$20 billion investment provided by ARRA in 2009.⁹³ The bill authorized \$17.2 billion in incentives through Medicare and Medicaid to assist providers in adopting HIT. Subsequent regulations

⁸⁹ BRADFORD H. GRAY & KATHY HEBERT, *THE URBAN INST., AFTER KATRINA: HOSPITALS IN HURRICANE KATRINA, CHALLENGES FACING CUSTODIAL INSTITUTIONS IN DISASTER 2* (2006), available at http://www.urban.org/UploadedPDF/411348_katrinahospitals.pdf.

⁹⁰ See generally Ofer Merin et al., *The Israeli Field Hospital in Haiti—Ethical Dilemmas in Early Disaster Response*, 362 *NEW ENG. J. MED.* e38 (2010) (describing the experience of medical practitioners in a field hospital in Port-au-Prince, Haiti, following a massive earthquake).

⁹¹ J. Preston et al., *Bridging the Gaps in Altered Standards of Care Planning Efforts: Results from a Series of Interviews and Analysis of Plans*, Poster presented at the National Healthcare Preparedness Evaluation and Improvement Conference in Washington, D.C. (July 2009) (on file with the Harvard Law School Library).

⁹² U.S. Dep't of Health & Human Servs., *Health Information Technology: For the Future of Health and Care*, <http://healthit.hhs.gov/portal/server.pt> (on file with the Harvard Law School Library).

⁹³ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (codified in scattered sections of Title 42 of the U.S. Code).

will define standards by which “meaningful use” of EHRs will be measured before providers could receive incentives.⁹⁴

HIT holds promise for bolstering public health preparedness in several important ways. First, HIT could assist with rapid communication between providers and with health departments, saving time that is critical in a crisis. For example, when US Airways flight 1549 made an emergency landing in the Hudson River between New York and New Jersey in 2009, New Jersey’s response was facilitated by data collected and disseminated through the state’s real-time integrated health information technology system, HIPPOCRATES.⁹⁵ During that emergency, New Jersey’s Health Command Center used the HIPPOCRATES system to notify partners—including health care providers, first responders, emergency managers, and public safety officials—with critical updates on flight details, EMS staging areas, deployment and location of ambulances, patient health statuses, and hospital bed statuses. Such a model could be replicated in other states, bolstered by the data framework developed in ARRA and health reform.

A fully functioning HER system would also facilitate rapid identification and treatment of patients after a crisis hits. Evacuees are at particular risk for confusion over treatment and reimbursement options, as individuals often evacuate without access to their medical records, prescriptions, and insurance information.⁹⁶ HIT and the nationwide deployment of EHRs would ensure these patients receive continuity of care for any chronic conditions, regardless of where they are treated. Such continuity would reduce the risk of exacerbating underlying health conditions unrelated to the immediate disaster, as well as the risk of medical errors and pharmaceutical interactions.

HIT could also improve access to vaccines for an infectious disease outbreak.⁹⁷ An ideal HIT system should automatically remind providers and their patients of scheduled immunizations, a model that could be leveraged to inform individuals of the need for vaccines during an infectious disease outbreak. For example, during the H1N1 outbreak, the United Kingdom used its system of EHRs to contact patients with chronic conditions to set up appointments for vaccinations.⁹⁸

⁹⁴ See Am. Coll. of Cardiology, Quality First, ARRA Health IT Provisions, <http://qualityfirst.acc.org/advocacy/Pages/ARRAHealthIT.aspx> (on file with the Harvard Law School Library).

⁹⁵ LEVI ET AL., *supra* note 1, at 26.

⁹⁶ See Steven H. Brown et al., *Use of Electronic Health Records in Disaster Response: The Experience of Department of Veterans Affairs After Hurricane Katrina*, 97 AM. J. PUB. HEALTH S136, S138–39 (2007) (examining the use of electronic health data in the month after Hurricane Katrina).

⁹⁷ COMM. ON REVIEW OF PRIORITIES IN THE NAT’L VACCINE PLAN & BD. ON POPULATION HEALTH & PUB. HEALTH PRACTICE, PRIORITIES FOR THE NATIONAL VACCINE PLAN 17 (2009), available at http://books.nap.edu/catalog.php?record_id=12796.

⁹⁸ Thomas Frieden, Dir., Ctrs. for Disease Control & Prevention, Remarks at 2009 H1N1 Experience: Policy Implications for Future Infectious Disease Emergencies (Mar. 5, 2010), available at http://www.upmc-biosecurity.org/website/events/2010_h1n1/agenda.html.

An integrated system of EHRs could also eventually enable rapid bi-surveillance and disease trend tracking over time. If public health departments had automatic notification of a cluster of high fevers, for example, EHRs could allow rapid case investigation and response to a potential infectious disease outbreak. The proposed ARRA meaningful use regulations require the reporting of certain chronic and infectious disease measures, which could assist public health departments in tracking and detecting health trends in their communities.⁹⁹ The meaningful use regulations do not allow health records to be searchable or explicitly permit health departments to have access to data, and it may be many years before public health departments and health care providers use integrated IT systems. However, moving the United States toward an electronic system lays groundwork important to an integrated system. Policymakers should use this opportunity to consider barriers preventing public health departments from taking full advantage of EHRs, such as concerns about patient privacy and the development of a well-trained public health workforce.

10. Implement a Widely Used, Reliable Telehealth System

CDC estimates that approximately 55 million people were infected with 2009 H1N1 between April and December 12, 2009. While not everyone sought treatment, the agency estimates there were about 246,000 H1N1-related hospitalizations and some 11,000 deaths.¹⁰⁰ Hospitals, ambulatory care centers, and doctors' offices all saw an increase in the number of patients seeking treatment for influenza. One of the solutions the U.S. government and the insurance and health care sectors developed to deal with the outbreak was the use of telephone or internet screening tools. HHS made available a self-evaluation tool for individuals on www.flu.gov,¹⁰¹ and CDC urged communities to implement call centers as a means to reduce surge.¹⁰² According to HHS Assistant Secretary of Preparedness and Response Nicole Lurie, these tools worked variably well during the outbreak.¹⁰³

These resources are an example of telehealth, or the delivery of health services and information via telecommunications, which could be a key to a more resilient population and prepared health system. One subset of

⁹⁹ See Health Information Technology Extension Program, 74 Fed. Reg. 25550 (May 28, 2009).

¹⁰⁰ CTRS. FOR DISEASE CONTROL & PREVENTION, CDC ESTIMATES OF 2009 H1N1 INFLUENZA CASES, HOSPITALIZATIONS AND DEATHS IN THE UNITED STATES, APRIL 2009–FEBRUARY 13, 2010, at 2 (2010), available at http://www.cdc.gov/h1n1flu/pdf/2009_H1N1_Estimates_031210_full_text_final.pdf.

¹⁰¹ U.S. Dep't of Health & Human Services, H1N1 Flu Self-Evaluation, <http://www.flu.gov/evaluation/> (on file with the Harvard Law School Library).

¹⁰² Ctrs. for Disease Control & Prevention, Managing Calls and Call Centers During a Large-Scale Influenza Outbreak: Implementation Tool (July 30, 2009), <http://www.cdc.gov/h1n1flu/callcenters.htm> (on file with the Harvard Law School Library).

¹⁰³ Nicole Lurie, Assistant Sec'y, Dep't of Health & Human Servs., Remarks at 2009 H1N1 Experience: Policy Implications for Future Infectious Disease Emergencies (Mar. 5, 2010), available at http://www.upmc-biosecurity.org/website/events/2010_h1n1/agenda.html.

telehealth is telephone (or other electronic) help lines that serve as a kind of electronic triage. Use of telephone triage could be particularly important during an infectious disease outbreak when health care facilities could struggle to isolate contagious patients. A fully formed telemedicine system would accustom the American population to self-triage before seeking emergency care and would reduce geographic disparities by allowing providers from other areas to help treat patients in a disaster zone. A robust telehealth network must be integrated with public health systems to allow public health departments to accurately track a disaster's impact.

Electronic triage tools can ease the burden on health care facilities by encouraging patients with mild illness to stay home and enabling more people to determine if they should seek professional care.¹⁰⁴ Telehealth could serve as the first line of triage during a disaster, enabling providers to consult during the initial stages of an infectious disease outbreak and reducing the strain on the health system. Under a triage system, potential victims and the "worried well" could first speak to a health professional to see if their symptoms warrant a doctor's visit, rather than overcrowding emergency departments and ambulatory care centers. A successful example of the effectiveness of telephone triage as a means to reduce surge is the use of telehealth techniques by Poison Control Centers in the United States: of 2.4 million contacts related to potential toxic exposures in 2004, 1.8 million (75%) were managed outside of health care facilities.¹⁰⁵ Developing a robust telehealth system could ease the burden on the health system by deterring overusage of emergency care on a regular basis and familiarizing the population with telephone-based triage before a disaster occurs.

Telehealth could also assist with actual treatment during a disaster and address some of the geographic or health disparities in access to care facing many Americans. The military has used this model for years in both battlefield medicine and disaster relief, and it has been used in civilian response to natural disasters.¹⁰⁶ In an urban area, for example, EDs and community health centers may quickly become overwhelmed in a disaster. In a rural area, meanwhile, patients may have to travel a long distance to access care. Telemedicine could allow each of these groups of patients to seek the advice of a provider via telecommunications before determining if he or she needs face-to-face care, or could help a provider in a small facility seek the expertise of a specialist in another region when treating an emerging or unfamiliar disease. Just as telephone triage could free up providers' time by reducing the demand on health facilities, telemedicine can ease the burden when a

¹⁰⁴ See Jonathan L. Temte, *Telephone Triage of Patients with Influenza*, 79 AM. FAM. PHYSICIAN 943, 943 (2009), available at <http://www.aafp.org/online/en/home/publications/journals/afp/preprint/influenza-telephone-triage.printerview.html>.

¹⁰⁵ GREGORY M. BOGDAM, A MODEL FOR ADAPTING COMMUNITY HEALTH CALL CENTERS TO SUPPORT OUTPATIENT HEALTHCARE AND MONITORING IN A MAJOR HEALTHCARE CRISIS 7 (2007), available at http://www.pandemicpractices.org/files/23/23_presentation_overview_task_order.pdf.

¹⁰⁶ Victoria Garshnek & Frederick M. Birkle, Jr., *Applications of Telemedicine and Telecommunications to Disaster Medicine*, 6 JAMA 26, 27-30 (1999).

local health care workforce is overwhelmed by a disaster by permitting participation of remote practitioners.

According to the federal government's *National Framework for 2009 H1N1 Influenza Preparedness and Response*, released in July 2009, one of the response priorities for HHS was to "[d]evelop internet and telephone capabilities that promote self care and home care in coordination with State, Territorial, Tribal, and local public health organizations, [and] private sector health care organizations capabilities."¹⁰⁷ However, telemedicine is still a ways from full-scale implementation. Assistant Secretary of Preparedness and Response Nicole Lurie found that a new approach to self-triage and telemedicine will be key to containing the cost of medical surge.¹⁰⁸ The Joint Advisory Committee on Communications Capabilities of Emergency Medical and Public Health Care Facilities, created by Congress as a result of the 9/11 Commission Act, has also recommended widespread utilization of telemedicine to address gaps in emergency response.¹⁰⁹

Development of telehealth must occur before a disaster hits in order to develop systems, prepare the population, and clarify reimbursement and credentialing issues. In particular, the widespread usage of telehealth for regular health services before a widespread emergency accustoms the population to calling a health line before going to a doctor or emergency department. These systems are not easily launched or made robust at the time of a disaster,¹¹⁰ when issues of legality, reimbursement, and public buy-in are too difficult to address. Instead, there must be a system in place ahead of time that can be enhanced when a disaster arises. While the United States took the first steps to deploy this technology during the 2009 H1N1 pandemic, we still lag far behind the rest of the world in terms of its deployment. According to remarks made by Dr. Frederick M. Burkle Jr. at the American Medical Association Third National Congress on Health System Readiness, telehealth lines have been raised on an ad hoc basis in the United States, but they are used every day in countries such as New Zealand, Canada, and Australia.¹¹¹ The United States should analyze and adapt the telehealth plans of its peer countries in order to better prepare itself for a public health emergency.

¹⁰⁷ WHITE HOUSE NAT'L SEC. STAFF, NATIONAL FRAMEWORK FOR H1N1 INFLUENZA PREPAREDNESS AND RESPONSE 7 (2009), available at <http://smtp.assoc-mgmt.com/SMA/QuickHits/NationalFramework.pdf>.

¹⁰⁸ Nicole Lurie, *H1N1 Influenza, Public Health Preparedness and Health Care Reform*, 361 *NEW ENG. J. MED.* 843, 844 (2009).

¹⁰⁹ JOINT ADVISORY COMM. ON COMM'NS CAPABILITIES OF EMERGENCY MED. & PUB. HEALTH CARE FACILITIES, REPORT TO CONGRESS FEBRUARY 4, 2008, at 2-3 (2008), available at http://energycommerce.house.gov/Press_110/JAC.Report_FINAL%20Jan.3.2008.pdf.

¹¹⁰ Email from Frederick M. Burkle, Jr. to Dara Alpert Lieberman (Jan. 13, 2010) (on file with the Harvard Law School Library).

¹¹¹ Frederick M. Burkle, Remarks at American Medical Association Third National Congress on Health System Readiness (Dec. 2, 2009) (notes on file with authors).

Telehealth remains an emerging technology in the United States, but policymakers, payers, and providers should consider the public health emergency capabilities of such systems as they are being developed.

CONCLUSION

The 2009 H1N1 outbreak should serve as a warning call to policymakers. Had the virus been more virulent, the United States could have seen billions of dollars in economic losses, widespread death, and disrupted societal structures.¹¹² A chronically underfunded public health system and unhealthy population places the nation at risk for a worst-case scenario when the next public health emergency occurs. Just as we do not fund fire departments after a fire breaks out, the United States can no longer afford to wait until a disaster strikes to build a prepared public health system.

The health reform and stimulus funding debates have highlighted the promise of public health, prevention, and wellness. While not explicitly addressed during the debates, public health preparedness could also benefit from a reformed system with the right priorities and strategies. The health reform debate has created the momentum to bring about change and modernize governmental public health and its partners. This momentum must move forward as we take on the challenge of enhancing our nation's preparedness. With the right priorities, we could modernize the public health system to be better prepared to respond to all health threats, while at the same time enhancing the underlying health of the nation and building community resilience.

The future of the nation demands that we do more to keep Americans healthy and safe. It is our hope that our elected officials and policymakers will recognize that preparedness is truly a part of a healthy nation and that they will develop and implement measures to address these underlying problems to enhance the health and security of all Americans.

¹¹² See JEFFREY LEVI ET AL., TRUST FOR AM.'S HEALTH, PANDEMIC FLU AND THE POTENTIAL FOR U.S. ECONOMIC RECESSION: A STATE-BY-STATE ANALYSIS 1-2 (2007), available at <http://healthyamericans.org/reports/flurecession/FluRecession.pdf>.