

Fighting Flu Fatigue

INTRODUCTION

Last year, the H1N1 pandemic thrust the flu into headlines around the globe.

Even though it was viewed as a relatively moderate pandemic, the novel H1N1 Influenza (A) virus still had a serious impact on the United States – infecting around 20 percent of Americans (approximately 60 million individuals), and resulting in approximately 274,000 hospitalizations and 12,000 deaths.¹ More people were hospitalized from H1N1 than are typically hospitalized from the seasonal flu. About 90 percent of the Americans who died from H1N1 were under the age of 65, and at least 340 children died from H1N1.² However, according to the U.S. Centers for Disease Control and Prevention (CDC) the actual number of deaths in children could be as high as between 910 and 1,880.

The H1N1 outbreak dramatically raised awareness about the threat that the flu poses, but now that a vaccine is widely available for H1N1 as part of the seasonal vaccine and concerns about the severity of the new strain of the virus have diminished, there is a real likelihood that the country will return to complacency in its attitude toward the flu.

Nevertheless, there remains a significant risk that a more serious new “pandemic” strain of the flu could still emerge. If a new flu virus emerged that was as severe as the 1918 pandemic, it could lead to 90 million Americans becoming sick, 2.2 million deaths, and major economic losses.³ According to Carolyn B. Bridges, M.D., of CDC, “just because we’ve just had a pandemic does not mean we’ve decreased our chances of having another. We have to stay vigilant.”⁴ For instance, as one potential concern, as of August 2010, there have been 500 total cases – including 300 deaths – from the H5N1 “bird” flu that public health officials and researchers around the globe have been tracking.⁵

We continue to face a serious threat each flu season. Seasonal flu is preventable with a vaccine, yet millions of Americans still needlessly get the flu each year. The flu is often seen as a nuisance, but it is actually very serious. According to CDC, between 1976 and 2007, flu-related deaths in the United States have ranged from a low of around 3,000 to a high of 49,000 Americans each year.⁶ Even for people who get sick, they need to take sick leave from work, possibly costing their pay and costing employers in lost productivity and the economy as a whole. In fact, the flu contributes to more than \$10 billion in lost productivity and direct medical expenses in the United States each year and another \$16 billion in lost potential earnings.⁷

This year, following the H1N1 pandemic, the country could take two different paths: we could go back to a national complacency around the flu or we could build on the momentum of response efforts and work toward increasing the number of Americans who are vaccinated to spare millions from suffering yearly from the seasonal flu and to better prepare the country for future health emergencies and disease outbreaks.

In this issue brief, the Trust for America’s Health (TFAH) examines recommendations to build on the momentum created by the investments over the past several years, prepare for a potential flu pandemic, enhance seasonal flu prevention and response efforts, and improve how the country routinely deals with the flu.

The first section reviews ways to protect more Americans from the flu by increasing vaccination rates, and the second section examines issues that must be addressed to continue to prepare the country for future pandemics and other health emergencies.



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PREVENTING EPIDEMICS.
PROTECTING PEOPLE.

I. INCREASING FLU VACCINATION RATES FOR THE SEASONAL FLU AND FUTURE PANDEMIC FLU OUTBREAKS

This year, for the first time, the Advisory Committee on Immunization Practices (ACIP), which advises CDC on vaccine issues, has recommended that all Americans – ages six months and older – should be vaccinated this flu season. A single vaccine will protect people against the seasonal viruses, which now includes H1N1.

Since flu is highly preventable, encouraging all Americans to get vaccinated could greatly reduce the number of people who get sick and die from flu complications – and cut down on missed school days and lost productivity from people who are out sick from the flu.

This recommendation is a dramatic shift in our national approach to the flu and presents a major challenge to implement. In an October 2010 public opinion survey conducted by Consumer Reports, only 37 percent of respondents said they would definitely get this season's flu vaccine.⁸

Traditionally, flu vaccination rates for adults (ages 18 and older) have been low. Only around 30 percent of American adults have routinely been vaccinated.⁹ One reason for these low rates is because there has been a long standing focus on vaccinating seniors (ages 65 and older), who are seen as one of the highest-risk groups for complications from the seasonal flu, and other high-risk groups, including young children and individuals with underlying chronic health conditions. For the 2010-11 flu season a new high dose vaccine is available for those 65 and older.¹⁰ According to Dr. Greg Poland of the Mayo Clinic, the new vaccine has four times the concentration of the material that stimulates the body to make antibodies, causing greater protection for older adults.¹¹ ACIP has not yet recommended a preference for the normal or high-dose vaccine for seniors.

Focusing on vaccinating seniors has helped contribute to an imbalance in vaccination rates based on age. For instance, nearly 70 percent of seniors were vaccinated in 2008, while only 24.1 percent of adults under the age of 50 were vaccinated.

Child flu vaccination rates have also historically been low. During the 2008-09 flu season, only 24 percent of children, ages 6 months to 17 years, received a seasonal flu vaccination.¹²

During H1N1, young children, young adults, and pregnant women were generally the top priority groups for vaccination. Since only a limited amount of vaccine was available at the start of the fall 2009 flu season, vaccination efforts first targeted the highest risk groups. As vaccines became more available, efforts expanded to vaccinate the general population.

By the end of June 2010, around 27 percent of Americans – more than 80 million individuals – were vaccinated against H1N1.¹³ By the time vaccinations were opened up to the general population, the virus had proven to be relatively moderate, which decreased much of the interest and incentive for the rest of public to seek vaccination. The H1N1 vaccination rate for children was nearly double that of adults, with more than 40 percent of children receiving vaccinations, compared to fewer than 23 percent for adults.¹⁴

Seasonal flu vaccination rates reached historically high levels – with 40 percent of adults ages 18 and older and 44 percent of children ages six months to 17 years old receiving the seasonal flu vaccination during the 2009-10 flu season.¹⁵

The following chart includes H1N1 vaccinations by state for the initial period of the outbreak – ending in January 2010. During this time, many locations initially had limited supplies of vaccine, which they targeted toward the most high-risk groups. Nationally, including the time period when the vaccine was widely available to the entire population and disease transmission had largely ended, overall vaccination rates only grew by two percent – from nearly 25 to 27 percent – from the end of January to the end of the flu season.

Adult H1N1 vaccination rates were the highest in South Dakota (34.4 percent), Maine (32.0 percent), and Minnesota (28.5 percent) and lowest in Mississippi (8.7 percent) and Alabama (10.7 percent).

Childhood H1N1 vaccination rates were the highest in Rhode Island (84.7 percent) and Vermont (72.3 percent) and lowest in Georgia (21.3 percent) and Louisiana (24.1 percent).

Estimated influenza A (H1N1) 2009 monovalent vaccination coverage among children and adults, by state -- United States, BRFSS and National 2009 H1N1 Flu Survey (NHFS), end of January 2010.

State	Children aged 6 mos to 17 yrs		Persons aged ≥18 yrs	
	%	(95% CI)	%	(95% CI)
Alabama	29.2	(+/-6.4)	10.7	(+/-1.9)
Alaska	26.6	(+/-5.6)	24.5	(+/-8.8)
Arizona	40.3	(+/-10.2)**	20.1	(+/-5.1)
Arkansas	50.0	(+/-19.7)§§ **	15.7	(+/-2.8)
California	31.2	(+/-5.5)	17.7	(+/-2.9)
Colorado	35.2	(+/-11.2)§§ **	20.4	(+/-3.0)
Connecticut	43.2	(+/-6.6)	15.2	(+/-3.8)
Delaware	45.4	(+/-8.7)	18.8	(+/-4.6)
DC	38.7	(+/-13.3)	14.6	(+/-4.5)
Florida	32.3	(+/-6.1)	16.1	(+/-2.1)
Georgia	21.3	(+/-5.0)	15.3	(+/-3.6)
Hawaii	55.4	(+/-10.9)**	23.4	(+/-3.7)
Idaho	29.5	(+/-5.6)	17.8	(+/-3.2)
Illinois	37.5	(+/-5.9)	21.6	(+/-3.7)
Indiana	46.7	(+/-7.7)	19.7	(+/-2.6)
Iowa	47.7	(+/-6.7)	27.4	(+/-3.4)
Kansas	39.4	(+/-6.5)	21.0	(+/-2.7)
Kentucky	31.8	(+/-5.3)	17.1	(+/-2.6)
Louisiana	24.1	(+/-4.3)	11.9	(+/-2.2)
Maine	60.2	(+/-9.4)	32.0	(+/-5.1)
Maryland	41.3	(+/-7.1)	21.4	(+/-2.8)
Massachusetts	60.3	(+/-8.8)	27.8	(+/-3.3)
Michigan	31.2	(+/-7.4)	15.3	(+/-2.6)
Minnesota	44.2	(+/-5.8)	28.5	(+/-4.3)
Mississippi	28.2	(+/-5.6)	8.7	(+/-1.9)
Missouri	27.5	(+/-6.2)	12.7	(+/-2.7)
Montana	33.6	(+/-5.6)	20.2	(+/-2.9)
Nebraska	40.8	(+/-6.3)	24.0	(+/-3.1)
Nevada	25.2	(+/-6.0)	15.8	(+/-3.5)
New Hampshire	45.5	(+/-7.5)	22.9	(+/-3.9)
New Jersey	32.7	(+/-4.6)	13.1	(+/-2.0)
New Mexico	39.3	(+/-12.1)	23.7	(+/-6.2)
New York	34.0	(+/-5.6)	18.3	(+/-3.8)
North Carolina	44.7	(+/-17.4)§§	21.4	(+/-3.5)
North Dakota	42.1	(+/-6.3)	25.6	(+/-4.6)
Ohio	33.5	(+/-5.4)	18.0	(+/-2.3)
Oklahoma	25.2	(+/-5.4)	18.0	(+/-3.2)
Oregon	35.3	(+/-6.3)	20.9	(+/-3.3)
Pennsylvania	36.8	(+/-4.4)	14.5	(+/-2.2)
Rhode Island	84.7	(+/-6.6)	26.6	(+/-5.2)
South Carolina	37.6	(+/-5.8)	14.6	(+/-2.5)
South Dakota	45.8	(+/-8.0)	34.4	(+/-4.8)
Tennessee	34.5	(+/-10.0)	19.5	(+/-3.2)
Texas	24.9	(+/-4.7)	13.7	(+/-2.1)
Utah	31.0	(+/-6.1)	21.4	(+/-7.5)
Vermont§§	72.3	(+/-6.3)	25.9	(+/-7.1)
Virginia	39.9	(+/-5.4)	22.6	(+/-3.6)
Washington	36.6	(+/-6.5)	23.4	(+/-3.1)
West Virginia	47.3	(+/-7.7)	18.2	(+/-2.7)
Wisconsin	30.6	(+/-7.8)	21.2	(+/-4.0)
Wyoming	32.6	(+/-6.0)	21.0	(+/-3.4)

§§ Estimates are based on NHFS only.

** Estimates might be unreliable because confidence interval half-width is > 10.

Source: Centers for Disease Control and Prevention. "Interim Results: State-Specific Seasonal Influenza Vaccination Coverage — United States, August 2009—January 2010" MMWR, 59(12):363-368, 2010.

In 2009-2010, seasonal flu vaccination rates for adults ranged from a high of 52.5 percent in Minnesota and 52.3 percent in South Dakota to a low

of 32.4 percent in Nevada. Seasonal flu vaccination rates for children ranged from a high of 67.2 percent in Hawaii to a low of 23.6 percent in Nevada.

Estimated seasonal influenza vaccination coverage among children and adults, by state -- United States, BRFSS and National 2009 Flu Survey (NHFS), end of January 2010.

State	Children aged 6 mos to 17 yrs		Persons aged ≥18 yrs	
	%	(95% CI)	%	(95% CI)
Alabama	33.5	(+/-6.3)	36.4	(+/-2.9)
Alaska	35.0	(+/-8.4)	37.2	(+/-5.8)
Arizona	41.3	(+/-12.0)§	40.4	(+/-4.8)
Arkansas* ^	65.3	(+/-15.8)§	41.0	(+/-3.7)
California	33.7	(+/-4.8)	37.5	(+/-3.5)
Colorado ^	42.9	(+/-11.3)§	42.4	(+/-2.7)
Connecticut	46.2	(+/-5.7)	41.3	(+/-4.1)
Delaware ^	42.9	(+/-6.6)	42.2	(+/-3.8)
DC ^	34.8	(+/-15.5)§	41.4	(+/-5.0)
Florida*	26.4	(+/-4.3)	33.0	(+/-2.2)
Georgia	30.8	(+/-7.1)	35.4	(+/-4.0)
Hawaii*	67.2	(+/-8.3)	47.6	(+/-3.0)
Idaho	30.5	(+/-6.0)	35.1	(+/-2.8)
Illinois	39.1	(+/-6.9)	39.0	(+/-3.1)
Indiana	46.2	(+/-9.7)	39.2	(+/-2.5)
Iowa	44.1	(+/-5.8)	50.2	(+/-3.1)
Kansas*	38.3	(+/-3.8)	43.5	(+/-2.4)
Kentucky	37.1	(+/-5.6)	42.3	(+/-3.1)
Louisiana	42.2	(+/-5.2)	40.1	(+/-3.1)
Maine*	57.2	(+/-7.5)	46.2	(+/-2.7)
Maryland*	51.0	(+/-6.9)	42.3	(+/-2.7)
Massachusetts* ^	61.6	(+/-9.4)	47.5	(+/-3.0)
Michigan	32.4	(+/-5.9)	37.2	(+/-2.8)
Minnesota	49.2	(+/-5.5)	52.5	(+/-3.9)
Mississippi	31.7	(+/-10.4)§	36.0	(+/-2.6)
Missouri	34.4	(+/-6.8)	39.7	(+/-3.4)
Montana*	31.6	(+/-5.3)	39.4	(+/-2.8)
Nebraska	42.9	(+/-7.7)	49.7	(+/-3.1)
Nevada*	23.6	(+/-5.2)	32.4	(+/-3.6)
New Hampshire	49.7	(+/-6.9)	46.2	(+/-3.6)
New Jersey ^	42.7	(+/-7.5)	36.1	(+/-2.4)
New Mexico	49.9	(+/-8.1)	44.3	(+/-3.5)
New York	40.6	(+/-7.1)	39.8	(+/-2.8)
North Carolina* ^	59.8	(+/-14.9)§	40.9	(+/-2.9)
North Dakota	45.5	(+/-7.4)	44.0	(+/-3.2)
Ohio	35.3	(+/-6.1)	38.8	(+/-2.4)
Oklahoma	37.2	(+/-6.8)	41.6	(+/-3.3)
Oregon	34.7	(+/-6.7)	39.2	(+/-3.0)
Pennsylvania*	47.8	(+/-6.5)	40.6	(+/-2.3)
Rhode Island	57.0	(+/-10.8)§	48.5	(+/-4.0)
South Carolina	32.6	(+/-6.0)	38.8	(+/-2.9)
South Dakota	54.0	(+/-8.2)	52.3	(+/-3.9)
Tennessee	44.5	(+/-8.9)	41.5	(+/-3.2)
Texas	40.5	(+/-4.7)	39.1	(+/-2.5)
Utah	36.5	(+/-8.6)	39.7	(+/-3.0)
Vermont ^	46.8	(+/-7.4)	39.8	(+/-4.0)
Virginia ^	40.8	(+/-6.0)	43.5	(+/-2.7)
Washington	43.9	(+/-7.4)	38.9	(+/-1.9)
West Virginia	41.2	(+/-9.8)	43.8	(+/-2.4)
Wisconsin	37.0	(+/-7.6)	40.6	(+/-3.3)
Wyoming	39.6	(+/-6.0)	39.7	(+/-2.5)

§ Estimates might be unreliable because confidence interval half-width is > 10.

* Child estimates were significantly different from adult estimates in the following states: Maine, Massachusetts, Maryland, Pennsylvania, Florida, North Carolina, Arkansas, Kansas, Montana, Hawaii, and Nevada.

^ BRFSS data were not collected for children in Massachusetts, Vermont, New Jersey, District of Columbia, Virginia, North Carolina, Arkansas, and Colorado. BRFSS data were not collected for adults aged 18-49 years not at high risk in Vermont and Delaware.

Source: Centers for Disease Control and Prevention. "Interim Results: State-Specific Seasonal Influenza Vaccination Coverage — United States, August 2009—January 2010" MMWR, 59(16);477-484, 2010.

The H1N1 vaccination efforts revealed the need to improve tracking systems of people who received vaccinations. Tracking systems are particularly important for monitoring vaccine adverse events, adequate coverage of target populations, and any inequities in access to the vaccine.

Encouraging more Americans to get vaccinated will be a challenge and require a significant education effort to ensure Americans know the benefits and safety of the vaccine. An October 2010 public opinion survey from the National Foundation for Infectious Diseases (NFID) found that 43 percent of Americans do not plan to get a flu shot this year.¹⁶ (The vaccine is available in both a shot and nasal spray form).

Moving forward, in order to significantly increase vaccination rates, a major campaign will be needed to provide:

- Education about the need for a yearly seasonal flu shot, focused on why everyone should get immunized, and the safety of the shots; and
- Increased easy access to flu shots, even to people who are uninsured or do not receive regular medical care.

One strategy to begin increasing vaccination rates involves targeting high priority areas or areas that need special focus, including:

- A. Increasing Education about the Need and Safety of Flu Vaccines, Especially to Minority Groups:** Even though flu vaccinations are considered very safe and effective, many Americans still harbor concerns about the safety of vaccines or believe myths that the vaccine can cause a person to get the flu.

VACCINES ARE SAFE AND PROTECT THE COMMUNITY

At the peak of fears over H1N1 flu, some groups worried about vaccines perpetuated a myth that it was safer to get H1N1 than to be inoculated against it. But data from California show that getting the flu was much more dangerous. According to statistics from the California State Department of Health, one in every 10,000 Californians who contracted H1N1 died.¹⁷ Out of 13 million Californians who were vaccinated for H1N1, three people died, and it was not confirmed that the deaths were necessarily linked to the vaccination.¹⁸

Flu vaccines are considered to be safe. They are monitored by several systems, including the Vaccine Adverse Event Reporting System (VAERS), a national voluntary reporting system jointly operated by CDC and the U.S. Food and Drug Administration (FDA). The system collects information about adverse events and it can potentially detect safety concerns, such as possible side effects that occur after the administration of vaccines. Another major safety monitoring system is the Vaccine Safety Datalink (VSD), a collaboration between CDC and eight large medical care organizations that conduct rapid population-based monitoring of the safety of flu vaccines as well as other vaccines.

A recent study of a seasonal influenza vaccine investigated the effectiveness as well as the safety of the vaccine over two flu

seasons. It found that the vaccine was safe and offered clinical benefit that exceeded the risk.¹⁹

Severe adverse reactions to the flu vaccination are rare. Other reactions are generally mild and self-limited, such as soreness at the vaccination site, and seldom interfere with the recipient's daily routine.²⁰

Officials also carefully examined the evidence before recommending flu vaccines for all children six months and older. A number of studies found a low risk of minor adverse events in vaccinated children, such as local skin reaction to injected vaccine, and wheezing or irritability after a nasal dose of vaccine. Serious adverse events, including hospitalization or death, were rare and not necessarily caused by the vaccine.^{21,22,23}

In addition, a recent study of 49 Hutterite farming colonies in western Canada showed how giving flu shots to schoolchildren protects a whole community from the flu -- creating what is called "herd immunity."²⁴ Doctors gave flu shots to half the communities and placebos to the other half, and more than 10 percent of the adults and children in the placebo colony had confirmed seasonal flu, compared to less than five percent of those in the flu shots colonies.²⁵

Clear, consistent education campaigns must be developed about the safety and effectiveness of the vaccine – and local efforts must be made to ensure individuals know when to get shots and where they are available, including alternatives to going to their doctors' offices.

Health reform presents an opportunity for a wide-scale campaign to teach the public that flu vaccines are a normal, safe part of a healthy life

and to teach providers that vaccines are not risky for most patients. The federal government should consider leveraging a small portion of the Prevention and Public Health Fund – which was created by health reform – for an ongoing, nationwide vaccine acceptance campaign to inform Americans of the need for everyone to be vaccinated against seasonal influenza.

Special, concerted outreach to minority groups is particularly important, since minority groups have much lower vaccination rates compared with Whites – but have higher rates of mortality and pneumonia associated with the seasonal flu.²⁶ H1N1 also had a disproportionate impact on racial and ethnic minorities. Disease experts suggest that overcrowding in urban areas and

higher rates of underlying chronic conditions such as diabetes may make African-Americans and Latinos at a greater risk of complications of influenza.

H1N1 hospitalization rates for African-Americans, Hispanics, and American Indian/Alaska Natives were nearly twice as high rates for Whites.

H1N1 Hospitalization Rates by Race and Ethnicity in the United States 2009-2010²⁷

Race/Ethnicity	Hospitalizations Per 100,000
White, non-Hispanic	16.3
Black, non-Hispanic	29.7
Hispanic	30.7
Asian/Pacific Islander	12.5
American Indian/Alaska Native	32.7

- According to the Illinois Department of Public Health, African-Americans and Latinos were hospitalized at a rate of 23 per 100,000 compared to Whites at a rate of seven per 100,000 from April 2009 to December 2009. They also found that the mortality rate was six per 100,000 for Latinos, and seven per 100,000 for African-Americans, versus three per 100,000 for Whites.²⁸
- In Boston, 71 city residents were hospitalized with H1N1 – 49 percent of whom were African-American and 28 percent who were Latino, double each minority group’s presence in the city. African-Americans and Latinos also account for a disproportionate share of the 477 laboratory confirmed cases of H1N1 in Boston.²⁹
- H1N1-related deaths among American Indians and Alaska Natives were four times higher than rates for all other groups according to data from 12 states across the nation.³⁰

While racial and ethnic minorities were at higher risk for complications from H1N1, vaccination rates were often lower.³¹ As of March 2010, vaccination rates were 9.8 percent lower for African-American adults than for Whites and 4.2 percent lower for African-American children. Rates were 11.5 percent lower for Hispanic adults, although rates were 5.5 percent higher for Hispanic children. For seasonal flu in 2009-2010, vaccination rates were 16.5 percent lower for African-American adults and 5.6 percent lower for African-American children than for Whites, and 21.7 percent lower for Hispanic adults and 2.6 percent lower for Hispanic children than for Whites.

In order to increase minority vaccination rates, campaigns must address negative beliefs and misinformation. Individualized, culturally appropriate, evidence-based information was found to be effective in increasing vaccination rates among disadvantaged, racially diverse, inner-city populations.³² To be effective in reaching diverse audiences, information must be provided in channels beyond the Internet, such as radio and racial and ethnic publications and television, and in languages other than English. Materials must be tailored to specific cultural perspectives. Communications should be from a trusted source, such as religious and community leaders. Translations also need to be idiomatic rather than word-for-word.³³

During the H1N1 outbreak, CDC conducted a series of focus groups to learn effective ways to communicate about the flu. Some key findings included the following:

- The message “Every flu season is different, and influenza can affect people differently. Even healthy children and adults can get very sick from the flu and spread it to others” was a concept that resonated with people who perceived themselves to be at low risk from the flu;
- Using data and statistics makes messages more credible and relevant. The more tailored the data for specific audiences, the more motivating the message;
- African-American focus group participants particularly responded positively to images of families and images that portrayed the older protecting the younger and serving as a role-model for positive health behaviors.³⁴

B. Making Flu Vaccinations Easy, Accessible, and Affordable for All Americans -- With Special Emphasis on Providing Shots for the Uninsured and Underinsured:

Every American should have access to an affordable or free flu shot. Many doctors prefer and encourage patients to get vaccinated through their “medical home” – by their primary care physician or pediatrician when possible – or through other doctors who provide them with regular care.

However, many insured Americans do not receive regular well care or regularly see doctors.

And millions of uninsured or underinsured Americans also go without regular care and also do not have insurance to help pay for vaccination costs.

Making shots easily accessible and affordable can greatly increase the chances that more Americans will get vaccinated. This requires providing flu shots where it is convenient – and covering the cost of vaccines and the associated administration fees through insurance or making free shots available.

■ **Making access to flu shots as convenient as possible:** Strategies that focus on making vaccinations more convenient by “going where the people are” to provide vaccines can dramatically help to increase vaccination rates. It is important to be sure that vaccines are administered by trained health care professionals in any location. Active immunization registries would be particularly helpful for being able to track individual vaccinations to share information with medical providers and population vaccination trends. Local health departments will need additional support in order to be able to offer clinics in a variety of sites and venues. It is also important to provide individuals with a record of their vaccination so they can share it with their doctors. This will help build a better system where the information can be directly provided to doctors, pediatricians, and other health care professionals when individuals receive a shot. Public health officials should work with groups and venues around the community to offer easy locations to provide vaccinations, particularly large institutions or places where people congregate. Visiting nurses can also come to locations, such as workplaces, to provide shots. Insurance plans must also be willing and able to pay for vaccinations given outside of the traditional medical home. Some venues that have been used or could be considered to be used to offer flu shots include:

▲ **Pharmacies:** Many pharmacies provide flu shots for a fee. Many pharmacies also have systems where they can bill a person’s insurance for payment.

▲ **Schools:** Shots can be provided to students, but efforts should be made to provide information about the vaccination to students’ pediatricians. Shots can also be provided to teachers and other staff. In addition, schools are a good location to provide vaccinations to parents and to members of the surrounding communities.

▲ **Child care facilities:** In addition to children, shots can be provided to all teachers and day care providers, which help protect the student community. Caregiver protection is particularly important for infants under six months of age, who are not able to get the vaccine yet.

▲ **Recreation centers and community centers.**

▲ **Faith-based organizations, such as churches and synagogues.**

▲ **Community health centers and other safety net providers.**

▲ **Health fairs.**

▲ **College campuses, at health centers and in other locations.**

▲ **Senior centers.**

▲ **Nursing homes.**

▲ **Shopping malls.**

▲ **Voting locations.**

▲ **Airports.**

■ **Making sure uninsured and underinsured can afford shots:** Lack of insurance should not put any Americans at increased risk of getting sick from the flu. The recent health reform bill will greatly expand the number of Americans with access to health insurance in the coming years – which will help provide insurance coverage for more people to receive more vaccinations. The flu vaccine will also be a required benefit without cost sharing in the “new” plans. However, even as the different aspects of the new health reform take effect, many will remain uninsured or underinsured. A lack of insurance may deter many Americans – particularly young adults and lower-income individuals – from getting vaccinated. For instance, right now, many young adults are ineligible for public programs, move between schools and jobs, have shorter tenure jobs, or work at entry-level jobs without benefits, so they go without health insurance.

C. Encouraging Seasonal Flu Vaccinations for All Health Care Workers:

Even though health care workers typically work around sick patients, their vaccination rates are often low. As of January 2010, only 62 percent of health care workers had been vaccinated against seasonal flu, and only 37 percent received an H1N1 flu shot.³⁵ In typical years, the rates of health care worker vaccinations are around 50 percent. According to a survey of nurses, the most common reason for not receiving a vaccine was concern about adverse reactions.³⁶

All health care personnel should receive the seasonal influenza vaccine. The ACIP has recommended this policy since 1986.³⁷ Studies have repeatedly shown that Americans have great trust in the advice of their health care providers. Health care providers are role models as well as trusted sources of information. Americans are less likely to trust the safety of vaccines if their providers are not vaccinated, and no one should ever get the flu from their doctor, nurse, or medical technician. Influenza can be fatal for already sick or immunocompromised patients. Health care professionals must themselves serve as role models and stress the importance of the yearly flu vaccination to patients. The U.S. Department of Health and Human Services (HHS) is planning to include a section about flu vaccination of health care workers in its revised action plan to prevent health care-associated infections.³⁸

There is currently a debate around whether health care worker vaccination should be mandatory or voluntary. In the meantime, the goal should be 100 percent vaccination of health care

personnel. For measurable progress to occur, policymakers, employers, and the health care workers themselves must commit to achieving as close to universal seasonal flu vaccine coverage of health care personnel as possible. To be successful, executive and senior staff in health care facilities must be involved in ensuring widespread vaccine acceptance and vaccination.

Proponents of mandatory vaccination policies believe the public health benefits of protecting patients and reducing worker absenteeism, as well as the historically low rates under voluntary programs and the mandate for health care workers to “do no harm,” justify requiring vaccination as a condition of employment. Proponents of voluntary policies argue that mandatory programs violate the civil liberties of healthcare personnel, who should be able to opt out of vaccination programs.

Health facilities can incentivize workers to get vaccinated, including providing the vaccine for free, comprehensive education for employees, and publicly reporting vaccination rates. States and the Centers for Medicare and Medicaid Services (CMS) could incentivize higher rates through public reporting and/or lower reimbursement for facilities that fail to meet certain standards, as it will soon be doing with other quality measures. The Joint Commission, which provides evaluations and accreditation of hospitals and other health care facilities, could strengthen its accreditation requirements related to facilities’ health care worker vaccination programs by expanding the flu vaccine standard to all accredited settings; requiring public reporting of vaccination rates; and setting a benchmark that facilities must meet.

EXAMPLES OF WAYS TO HELP INCREASE HEALTH CARE WORKER VACCINATION RATES

Some hospitals and health care settings are trying new policies to help encourage health care workers to get vaccinated.

For example, at the Children’s Hospital and Medical Center in Omaha, Nebraska, employee vaccination rates climbed from around 50 percent to around 97 after some new policies were instituted, including requiring staff to sign an explicit form if they decline vaccination that acknowledges the possibility that not getting immunized could spread the virus to children and requiring workers who did not get vaccinated to wear surgical masks through the flu season.³⁹

II. PREPARING FOR A POSSIBLE FUTURE PANDEMIC AND OTHER HEALTH EMERGENCIES

The response to the H1N1 outbreak showed the country was much better prepared to respond to a pandemic than it would have been a few short years ago. There was an unprecedented large-scale nationwide public health response including surveillance, laboratory testing, public and practitioner education, medical countermeasure management, and the distribution and launch of a national vaccination campaign, all in a very short period of time. However, the outbreak also revealed major ongoing gaps in America's readiness for future pandemics and other health emergencies.

Since the National Strategy for Pandemic Influenza was issued in 2005 and building on the efforts that came about after the September 11, 2001 tragedies and Hurricane Katrina, the country is significantly better prepared for pandemic and other health emergencies. As a result, the country created a strong, in-depth national response plan, which included defined and delegated roles and responsibilities for every federal agency and grants to support preparedness in states. In addition, every state had a plan in place that had been reviewed by the U.S. De-

partment of Health and Human Services (HHS) and included steps for how to set up mass vaccination campaigns. Many communities, businesses, schools, and other organizations around the country also created pandemic plans.

When H1N1 emerged in the spring of 2009, government officials acted quickly to respond. Congress appropriated \$1.9 billion in emergency supplemental funding and an additional \$5.8 billion in contingency funding. These funds helped enhance vaccine production capacity, purchase and distribute vaccines, upgrade surveillance capabilities, and meet other needs.

However, the emergency funding could not backfill long-existing gaps in the nation's public health infrastructure.

The outbreak not only provided a real-world scenario that tested pandemic plans, but also tested the fundamentals of the overall public health system, and showed that while plans and emergency resources are important, plans can only be effective if there is a strong enough public health infrastructure to carry them out.

EVENTS OF H1N1

On April 26, 2009 a public health emergency was declared in the United States as cases of H1N1 began to spread across the country. More than a year later, the emergency declaration expired on June 23, 2010. Approximately 60 million Americans had H1N1 during this time. According to CDC, around 274,000 people were hospitalized and 12,000 individuals in the United States may have died from H1N1.⁴⁰ Traditionally, about 90 percent of individuals who die due to complications from the flu are over the age of 65, but in 2009, 90 percent of those Americans who died from H1N1 were under 65.⁴¹ In a typical year, about 100 flu-related deaths of children under the age of 18 are reported to CDC, but during the pandemic, more than 300 flu-related deaths among children were reported to CDC.⁴² Between April 2009 and January 2010, there were approximately 19 million cases among those younger than 18, 33 million cases for those 18 to 64 and just five million for those 65 and over.⁴³

“WE ARE GRATEFUL FOR THE MODERATE IMPACT (OF H1N1). HAD THE VIRUS TURNED MORE LETHAL, WE WOULD BE UNDER SCRUTINY FOR HAVING FAILED TO PROTECT LARGE NUMBERS OF PEOPLE.”⁴⁴

-- MARGARET CHAN, MD, WORLD HEALTH ORGANIZATION (WHO) DIRECTOR-GENERAL

“EVERY INFLUENZA PANDEMIC IS DIFFERENT. PLANNING AND INVESTING IN KEY RESOURCES AHEAD OF TIME, AND BEING ABLE TO NIMBLY ADJUST TO CHANGING CIRCUMSTANCES ARE TWO KEY LESSONS LEARNED SO FAR FROM THIS H1N1 PANDEMIC. THEY ARE ALSO LESSONS LEARNED THAT WILL HELP US CONTINUE RESPONDING TO THIS EVENT AS WELL AS THE NEXT ONE.”⁴⁵

-- MARK HORTON, DIRECTOR OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

ACCREDITATION AND PREPAREDNESS

In order to improve the health of the public, the national Public Health Accreditation Board (PHAB) developed a national voluntary accreditation program for state, local, territorial and tribal public health departments that will launch in 2011. The goal of the accreditation program is to improve and protect the health of every community by advancing the quality and performance of public health departments.

A study conducted by the North Carolina Preparedness and Emergency Response Research Center found that public health agencies accredited by the state of North Carolina performed a significantly larger scope of activities in response to the H1N1 outbreak compared to non-accredited agencies, and that these differences were “apparent in all domains of activity including planning, incident command, investigation, communication, and response and mitigation activities.”⁴⁶

The findings suggest that participating in and meeting accreditation standards can help public health departments effectively meet and demonstrate preparedness capabilities.

A. Addressing Real-World Lessons

The H1N1 outbreak showed that transferring plans from paper to action can be more difficult than is often anticipated. All local, state, federal, and private pandemic plans should be evaluated and revised based on lessons learned from the H1N1 outbreak. The challenges experienced from the real-world implementation of pandemic plans revealed a number of lessons for future planning, including that:

■ **Plans must be adaptable and science-driven.**

Even if preparations are based on past experiences, each disease outbreak is unique and unpredictable, and requires constant reassessment of priorities and guidance for the public and medical community. For instance, at the start of the H1N1 outbreak, no one knew how severe the virus would be. Officials had to constantly reevaluate issues like school closure recommendations to match changing circumstances. Some aspects of plans must be flexible enough to adapt to changing circumstances as well as differing resources and situations across locations.

■ **Establishing trust with the public through clear and honest communication is imperative.** If the public does not receive timely information or trust the information they receive, they are unlikely to comply with rec-

ommendations. This is particularly challenging when the situation is unfolding at the same time when there is a need to communicate with the public. Messages must strike a balance between building trust and communicating that the guidance will change. Acknowledging uncertainty can be an important component of building trust. The H1N1 pandemic also showed the challenge and frustrations of communicating about priority groups for vaccination and treatment, particularly when the groups were not consistent for every community. Since there could also be limited early availability of vaccine in future potential pandemic outbreaks of new strains of the flu, it is important to create clear and consistent priority group recommendations – as well as clear mechanisms for communicating who the priority groups are and how they change as circumstances unfold. The lack of an immediate widely available vaccine also underscored the importance of having a strong, clear message about basic hygiene and social distancing, which are important to help slow the spread of seasonal flu, and may also be particularly important in the early stages of outbreaks before a vaccine is available. Some special communications concerns that arose during the outbreak included:

▲ **Declaring “emergency” messages and pandemic level alerts:**

According to an after action report from the Association of State and Territorial Health Officials (ASTHO), one unintended consequence that arose from official public health emergency declarations, which are often required to make resources available, was that declarations often “made the situation sound much more severe and threatening than it actually was.”⁴⁷ One potential challenge for the future is to find ways to legally declare emergencies in ways that are consistent with messages that officials want to convey to the public. Another problem was that it was not clear what impact the declaration of a national health emergency was supposed to have. In the years of planning, it was assumed that such a declaration would mean enhanced powers for health authorities, but this did not happen. In some states, a state declaration of an emergency seemed to be necessary even though there was a national declaration. In addition, ASTHO reports that members of the public were often confused by the difference between the World Health Organization (WHO) pandemic rating announcements and statements from HHS about the severity of the pandemic.

▲ **Reaching the highest risk populations who often have the lowest trust levels:**

The H1N1 outbreak disproportionately impacted racial and ethnic minorities – at the same time, these communities are often the most reticent to trust government recommendations and messages. To earn the trust of these communities, special efforts must be made to target racial and ethnic minorities with communications that are tailored to resonate with these communities and are as transparent and straightforward as possible. It is essential that these relationships are established and maintained on an ongoing basis. It is too late to try to establish this type of trust during an emergency. The ongoing work of public health departments – such as reaching out to high risk communities around the seasonal flu and working with these communities on chronic disease prevention – provide numerous opportunities for building and strengthening these ties. These pre-established relationships could lead to increased trust and hopefully increased vaccination in a pandemic situation.

■ **Recommendations for sick leave, school closings, and limiting community gatherings have major ramifications that must be taken into account.** Although community mitigation

measures, such as social distancing, are particularly important before a vaccine is available, the H1N1 outbreak demonstrated the challenges with implementing these measures. At a news conference in late April 2009 President Obama emphasized this: “If you are sick, stay home. If your child is sick, keep them out of school.”⁴⁸ These seemingly simple measures proved to be more complicated in reality.

▲ **Sick leave:** Health officials encouraged people who were sick to stay home. This guidance can be hard to follow, particularly for around 40 percent of American workers in the private sector who do not have any paid sick leave available. This amounts to approximately 40 million people, and disproportionately includes women, lower-wage workers, and part-time workers.⁴⁹ In addition to those lacking personal sick leave, millions more do not have sick leave that enables them to take time off to care for an ill child, spouse, or parent. Congressional legislation has been introduced – but not passed – to require employers with 15 or more employees to offer a minimum of seven paid sick days each year, which could be used for individual health needs or to care for sick family members.

A report “Sick at Work: Infected Employees in the Workplace During the H1N1 Pandemic” released by the Institute for Women’s Policy Research found that, although almost 26 million employed Americans adults may have been infected with H1N1 in 2009, nearly eight million employees took no time off work while infected. “Employees who attended work while infected with H1N1 are estimated to have caused the infection of as many as 7 million co-workers.”⁵⁰ This could mean that restaurants, child care centers, nursing homes, hotels, public transit systems, schools, businesses, and health care providers across the country may have been operated and run by individuals infected with the flu who lack the ability to take sick leave.⁵¹

▲ **School closings:** Hundreds of schools across the United States closed in the initial weeks of the H1N1 outbreak. Officials were not sure how severe the outbreak would be, and often chose to be cautious. HHS Secretary Kathleen Sebelius noted that with school closings, “there is a large ripple effect. What happens to the parents? Where do those children go? Do you close the day care center if a younger sibling is there?

Many schools' and communities' emergency plans will be put to the test during the weeks and months to come.⁵² During the outbreak, public health officials reported that implementation of school closings was difficult, and many parents ended up dropping their children off at libraries, community centers or other locations.⁵³ A public opinion survey by the Harvard School of Public Health found that 43 percent of respondents said school or daycare closures would likely cause a loss of income and money problems, and over a quarter of parents responded that having to stay home with children would cause them to lose their job or business.⁵⁴

In the event of a future pandemic, if schools need to be closed for a significant period of time, issues of handling parental sick leave and ways to limit interaction of at-risk children must be addressed. In addition, many families rely on food assistance programs, particularly the National School Lunch and Breakfast program, and before and after school care, which could all be disrupted during school closures.

■ **Coordination across communities, states, and countries is extremely complicated, but must be a high priority.** The H1N1 outbreak showed how difficult it can be to coordinate across borders and even within local communities. One challenge, according to the after action report by ASTHO, was that states and localities were receiving guidance documents and updates so frequently that they found it hard to keep up with the information and make timely decisions about the appropriate next steps or what to communicate to their stakeholders.⁵⁵ For instance, according to an after action report in California, "One rural community stated that they would sometimes have two or three versions of the same guidance document and didn't know which was the most recent."⁵⁶ Some local health departments have suggested centralizing how and where information comes from into a single, accessible area to minimize the amount of time each community had to spend synthesizing information.⁵⁷ Many local health departments also reported that they relied on the routine summaries of the CDC conference calls since it was hard to keep pace with and synthesize the information provided on the numerous calls that were being held. In addition, health care providers reported that communication between providers and the public health system was often slow and uncoordinated.⁵⁸

The H1N1 outbreak also showed how challenging it is to coordinate among countries, particularly when they may have competing interests when there is low availability of vaccines or medicines. For instance, when the outbreak was initially identified in Mexico, many countries quickly tried to close borders and restrict travel despite recommendations from public health experts, and different countries around the globe had vastly differing levels of investments and guidance around vaccines and medicines. Greater effort must go into fostering international communications and collaboration in responses to outbreaks.

■ **Limited legal authorities and competing emergency declarations must be better coordinated to avoid confusion and provide protection to volunteers.** Thirty-three states and D.C. had statutes that extended some level of immunity to business and non-profit organizations providing charitable, emergency, or disaster relief services, although these laws varied greatly among states, according to a study by the Public/Private Legal Preparedness Initiative, North Carolina Institute for Public Health. In addition, according to the Office of the General Counsel at HHS, volunteer health professionals and some paid health personnel may or may not be covered under a "patchwork" of federal liability protections.⁵⁹ An H1N1 after action report conducted by ASTHO found that legal authorities were an issue in some states. Lack of defined emergency declaration or specific liability coverage for medical volunteers during the H1N1 outbreak hindered the response and limited the ability to provide care in some states.⁶⁰ The Medical Reserve Corps reported that in some places, "the lack of state provisions ensuring liability protections for health care and other volunteers inhibited recruitment and made some reluctant to volunteer initially to help with H1N1 response activities."⁶¹

In addition, multiple federal emergency declarations, including the National Emergency Act and the Stafford Act, created confusion during the H1N1 pandemic.⁶² Follow-up should be conducted to understand what was effective in areas where existing laws worked and what issues should be addressed to improve the laws that did not work as well in other places. Before the next emergency, HHS and states should also clarify what liability protections are in place for volunteer health professionals and attempt to translate the current patchwork of federal and state protections into coherent, defined liability coverage.

■ Building a Stronger Foundation

Notwithstanding the strong federal, state, and local response, the H1N1 outbreak highlighted gaps in U.S. preparedness to face not just future health emergencies, but also to satisfy ongoing responsibilities required to respond to the seasonal flu.

Numerous after action reports, including those from ASTHO and the National Association of County and City Health Officials (NACCHO), called for a more consistent and robust investment in the underlying core infrastructure that supports the response to any and all health emergencies as well as regular activities.^{63, 64}

During the H1N1 outbreak, the capacity of health departments to track, investigate, and contain cases of H1N1 was pushed to the limit due to lack of resources. However, instead of new investments to help replenish and fill gaps in the public health system, departments around the country are experiencing major cuts.

Prior to the H1N1 outbreak, public health departments' resources, funding, and personnel were already stretched thin from budget reductions that were measured beginning in 2008, making it challenging to conduct effective seasonal flu vaccination public education campaigns, track the spread and severity of the seasonal flu virus strain, and hold vaccination clinics with trained staff. During the second half of 2009, almost half of local health departments lost necessary workforce, adding up to 8,000 lost jobs. Layoffs and attrition to the local health department workforce in the last six months of 2009 combined with the 15,000 jobs already lost from 2008-2009 resulted in a cumulative loss of 23,000 jobs. In addition to lost jobs, during the latter half of 2009, 13,000 local health department employees were affected by shortened work weeks and mandatory furloughs because of budget cuts.⁶⁵

The current economic climate means states and localities are facing budget shortfalls and many have cut funding and staff for public health departments. According to the Center on Budget and Policy Priorities, 48 states are experiencing shortfalls in their budgets for FY2010 that total \$168 billion, which is one-quarter of state budgets.⁶⁶ Future predictions are that the situation will get worse in FY 2011.⁶⁷ Public health funding is discretionary spending in most states and, therefore, is at high risk for significant cuts during economic downturns. While few states allocate funds directly for public health preparedness, state and local funding is essential for supporting public

health infrastructure and core capacities of health departments. Everyday programs, services, and resources must be maintained and remain strong and scalable to serve as a solid foundation to more effectively respond to large-scale public health events.

While there was the quick release of emergency supplemental funding for the H1N1 response, public health departments were also experiencing budget and staffing cutbacks, making these new and one-time funds not necessarily additive. Because they were short-term funds, states often could not rehire lost personnel or require work during state-mandated furlough days. Much of the success experienced by state and local health departments in responding to the H1N1 pandemic was attributable to the years of planning, training, and relationship-building that emergency preparedness funding had made possible over the previous decade. Budget cuts were overcome by the flow of Public Health Emergency Response (PHER) funds from the federal government. These were one-time only funds, which helped the response but will not help build a lasting and effective infrastructure.⁶⁸

Over the years, federal funding for state and local public health preparedness has also eroded. In fiscal year (FY) 2009, the funds for the federal cooperative agreement grants that support state and local public health preparedness was down approximately 25 percent from FY 2005 levels. A portion of these remaining funds were also in jeopardy when the Administration had also proposed cutting \$184 million from the Public Health Emergency Program (PHEP) cooperative agreements for FY 2011, but Congress did not end up making these cuts.

Some key areas that need to be at the ready for any potential emergency and to respond to the seasonal flu, but are often lacking due to limited resources include:

- **Up-to-date and available pharmaceuticals, vaccines, and medical equipment;**
- **Surge capacity to provide mass care to patients; and**
- **Core public health infrastructure, such as surveillance, laboratory capacity and workforce.**

Without increased and sustained investments in core public health functions, the country will always be less than optimally ready for health emergencies – leaving Americans open to unnecessary risks.

I. Ensuring Up-to-Date And Available Pharmaceuticals, Vaccines, and Medical Equipment

The H1N1 outbreak showed how important it is to maintain the research and development of up-to-date countermeasures, including vaccines and antiviral medications, and to keep enough pharmaceuticals and medical equipment stockpiled for emergencies. Having the ability to respond quickly is essential during an outbreak or emergency, but requires an ongoing investment in pharmaceutical research and development and stockpiling of medicines and equipment.

Last year, scientists raced against the clock to develop a vaccine to protect against the H1N1 flu strain, yet they were operating with an outdated vaccine research capacity and technology. Despite these challenges, vaccine manufacturers were able to produce limited quantities of vaccine by mid-fall, which public health officials directed to the highest-risk populations. However, it took until later in the year before enough vaccine was available for the entire U.S. population. This delay in the supply further discouraged people from getting vaccinated.

In addition to vaccine development, within one week of the outbreak, the Strategic National Stockpile (SNS) delivered more than 11 million courses of antiviral drugs, 12.5 million face-masks, and 25 million N-95 respirators to 62 predetermined areas in states and localities around the country. These materials included 25 percent of the states' fixed pandemic influenza allocations and was the first large scale distribution of its kind.⁶⁹ In the fall, an additional 535,000 courses of antiviral drugs and 59.7 million N-95 respirators were also deployed from the SNS in response to the pandemic emergency.

The rapid development of a vaccine despite limited production capabilities and the quick distribution of antivirals and other equipment were only possible due to prior investments in research and development, stockpiling, and practice in drills and tabletop exercises.

In late August 2010, the Obama administration announced a plan to build the medical countermeasure capacity to respond to future pandemic and bioterrorism threats, including plans to use \$1.9 billion, most of which would come from the H1N1 response.⁷⁰ A large portion of these funds would be devoted to improving the capability to quickly develop drugs and vaccines in the case of a pandemic – including \$822 million for pandemic influenza vaccine development, \$200 million to create a government sponsored firm to create innovation in the pharmaceutical industry, and \$170 million to improve FDA regulation of the drug-development process.⁷¹

During this period, issues related to vaccines, antivirals, and medical equipment that should be addressed came to light, including:

■ **Improving Vaccine Research and Development:** An August 2010 report released by the President's Council of Advisors on Science and Technology (PCAST) highlighted five key points necessary to improve vaccine capabilities in the United States to prepare for possible future pandemics, including:⁷²

- 1) Surveillance: Accelerate identification of newly emerging pandemic viruses, so vaccine production can start sooner;
- 2) Seed viruses: Develop a collection of stock viral "backbones" to allow faster production of specific vaccine strains;
- 3) Sterility tests: Develop better and faster tests to ensure sterility during vaccine production;
- 4) Potency-test reagents: Develop faster and more reliable tests to document vaccine potency; and
- 5) Fill-and-finish: Enlarge capacity and modernize machinery used in final stages of vaccine production, including vial-filling.

In addition, a number of promising studies are underway to find a "universal" flu vaccine, which would have the potential to provide protection to individuals from all flu strains for decades. However, this vaccine may still be years away from being available to medical and public health officials.

■ **Replenishing and Coordinating the Antiviral Stockpile:** Overall, according to after action reports, the deployment and distribution of materials from the SNS went according to plan.⁷³

⁷⁴ However, there was not a clear mechanism for tracking how antivirals from the SNS were used and there is uncertainty of how many SNS supplies states have left. Antivirals deployed from the SNS were replenished in summer 2009. In addition, other issues related to antiviral distribution and guidance include:

▲ Many states reported that they were unsure about administering countermeasures, fees for dispensing, and costs of recovering and disposing of expired countermeasures. In the ASTHO after action report, one state replied that, "guidance from CDC for treatment was excellent; however, guidance on how and when to use the stockpile was absent;" lack of guidance on triggers and strategies for antiviral also made it difficult for local health departments to manage antivirals they received from the state.

▲ Some local health departments lacked storage or cold chain management (climate-controlled storage) capabilities for SNS supplies. A number of localities returned unused supplies to the states or distributed them to hospitals instead;⁷⁵

▲ According to an upcoming, not-yet-published report from a think tank NACCHO convened, local health departments experienced a range of additional challenges related to antiviral use and distribution, including that:

- While local health departments had preparedness plans that outlined strategies for receiving, storing, distributing, dispensing, and tracking antivirals, plans often lacked the level of detail, infrastructure, and formalized agreements required to operationalize those strategies.

- As CDC antiviral guidance evolved to reflect the epidemiology and practices during H1N1, it was challenging for local health departments to similarly modify their plans and communicate these changes to stakeholders. For example, local health departments had difficulty explaining to first responders why national guidance no longer prioritized them over other groups for antiviral treatment.

- During H1N1, local health departments needed to communicate how antivirals should be used, where antivirals were available, and what groups were prioritized to receive them. This information was both difficult to obtain from state health departments and communicate with the public, which led to delays in messaging and hindered the ability of local health departments to be in front of the situation early. This impacted the ability of local health departments to ensure timely access to antivirals. Communication was especially difficult in jurisdictions where providers and other antiviral prescribers did not perceive the local health department as the opinion leader in the community.

▲ Many people received commercially-supplied antivirals through the private pharmacy system, which complicated plans for decisions around the government release of the federal stockpile; and

▲ States and localities noted the need for more guidance about the use and dosing of oseltamivir (Tamiflu) for children.⁷⁶ There are still no stockpile goals for antivirals suitable for children in the SNS.

■ Ensuring Adequate Availability of Appropriate Emergency Medical Equipment:

There were conflicting opinions during the H1N1 outbreak on what type of facemasks or respirators should be used by medical professionals. In September 2009, the Institute of Medicine (IOM) advised physicians and other health care professionals to use fitted N-95 respirators, while CDC recommended N-95 use for health care workers, but recommended against their use in community and home settings except potentially for people at increased risk for severe illness from the flu. Meanwhile, the Occupational Safety and Health Administration (OSHA) supported the use of facemasks and N-95 respirators in the workplace and suggested employers should stockpile facemasks and respirators in case of a pandemic.^{77, 78, 79, 80} More research will help lead to consensus about how to best protect health care workers during a pandemic. In September 2010, CDC released new guidance for preventing flu in health care settings recommending the use of surgical masks instead of N-95s, based on information gathered during the 2009-2010 season.⁸¹ The impact of this guidance, including acceptance and compliance, should be monitored.



2. Upgrading Surge Capacity to Be Able to Provide Mass Care to Patients

While the H1N1 flu pandemic turned out to be relatively mild, future pandemics could be much worse. Preparing for the outbreak showed how quickly overwhelmed the medical system could have been if the pandemic had been more severe.

During the initial phases of H1N1, outpatient clinics and doctors' offices were overwhelmed and many did not have any system for triage, separating infectious patients, or protecting workers and their families. Emergency rooms were overrun in spring. In New York City alone, 44,678 people visited emergency rooms with flu like symptoms from May 15 to June 15, compared to just 4,267 the previous year.⁸²

In the event of a severe outbreak or health emergency, the health care system would be stretched beyond normal capabilities. Patients would quickly fill emergency rooms and doctors' offices, exceed the existing number of available hospital beds, and cause a surge in demand for critical medicines and equipment, including antiviral medications, ventilators, and protective masks.

Surge capacity, the ability of the medical system to care for a massive influx of patients, remains one of the most serious challenges for emergency health preparedness. Improving health care system preparedness means having enough supplies, staff, and space available to treat an influx of patients.

TFAH recommended a series of ways to bolster health care system emergency preparedness in the *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism 2009* report, including:

■ **Full funding of the Hospital Preparedness Program (HPP) and developing a long-term solution to funding hospital preparedness:** HPP is a federal grant program intended to enhance the ability of hospitals and health care systems to prepare for and respond to bioterrorism and other health emergencies. The funding for the HPP program is limited and does not cover large-scale emergency capabilities. Hospitals receive an average of \$80,000 annually, but some receive as little as \$10,000. To be as effective as possible in the current form, the HPP program must be fully funded, but policymakers should also examine if HPP is the best model for preparing the health system for a disaster. HPP is a relatively unstable (discretionary) funding stream, and health facilities may not be motivated to meet HPP grant requirements for a relatively small sum of money.

■ **Extending the Hospital Preparedness Program to include the ambulatory care system:**

During the H1N1 outbreak, doctors' offices and ambulatory care centers were overwhelmed with patients, yet there is no system in place to provide support for these providers. The current HPP grants could be expanded to include these providers.

■ **Expanding the Hospital Preparedness Program to include coordination with state and local health departments:**

Hospital plans need to be coordinated with state and local health department efforts to assure appropriate first responder, treatment and triage resources in the community or the region being served.

■ **Improving crisis standards of care planning and development:**

The federal government should take a more active role in the planning and development of crisis of care standards and take steps to address the legal issues created when the need for care overwhelms available resources (staff, supplies, and space) in an emergency.

■ **Improving regional coordination of health care facilities, including alternative care sites:**

Better coordination among hospitals, state and local health departments, and emergency management agencies to build and strengthen regional consortiums would lead to more efficient use of resources. This includes regional coordination with local health departments and with state health department resources and plans.

■ **Addressing issues that create barriers to successful alternative care sites:**

Alternative care sites are often one of the most efficient and effective ways to provide care in mass emergencies, but issues related to facilities planning, coordination among health agencies and providers, licensing and liability concerns, and resources to support the sites have meant only limited numbers of communities have strong alternative care plans and capabilities.

■ **Creating incentives and limiting obstacles to recruiting a surge workforce:**

It is essential to set up surge workforce plans so providers are ready for times of emergency, including creating incentives for private and public health workers to participate, and reaching out to a range of staff, including administrative staff, medical technicians, EMS, public safety workers, and medical and nursing students in addition to doctors and nurses. Issues of liability, licensing, and accreditation should all be addressed ahead of an emergency.

3. Modernizing and Fully Funding Core Public Health Infrastructure

The capacity to track, investigate, contain and prevent cases of H1N1 was hampered by a lack of resources. The public health system has been underfunded for decades, which makes carrying out day-to-day functions a challenge. When an emergency arises, it typically stretches public health departments beyond their limits. And public health departments often do not even have the resources they need to meet the responsibilities required to carry out an effective seasonal flu response.

Unlike having a standing fire department or police capability, public health often only receives supplemental “crisis funding” support to respond to an emergency after it has already started.

According to a range of studies, from the IOM to CDC, many core public health functions are antiquated or do not have enough resources – leaving the nation unnecessarily vulnerable in times of emergencies. The H1N1 outbreak strained and diverted funds that were typically used for other public health functions from the already-struggling system.

A post-H1N1 assessment by HHS found the following major needs and gaps in sustaining state and local operations and maintaining key infrastructure:⁸³

■ **A reliable, sustained funding stream is needed for all core public health activities – such as disease surveillance, public health laboratories, and communications systems – to address on-going public health responsibilities and to ensure back-up capacity is available to respond to major public health emergencies.**

Two core areas that proved particularly problematic during the outbreak included:

▲ **Disease Surveillance:** Disease surveillance systems in the United States have been out-of-date and under-resourced for decades – and it hurt the ability of health departments to track and respond to the H1N1 outbreak. H1N1 surveillance was not uniform – including having two options for reporting hospitalizations and deaths and inconsistent utilization of confirmatory laboratory testing – so data could not be compared across states.⁸⁴ States are currently given the autonomy to report in the way they like. Many local health departments reported difficulty collecting data, and many reported that they were strained to even collect the minimum level of data.⁸⁵ State or regional data often obscures local and neighborhood-level differences. Some states reported that they were unable to keep up with processing laboratory information, causing a backlog of information and ultimately hindering their ability to describe the extent of the situation in their community or state.⁸⁶

PCAST has provided recommendations for ways to improve the systems so data is rapid and easily accessible to allow experts to track the course and severity of disease outbreaks. This would help identify how to target vaccination campaigns, where and when additional antiviral medications and medical equipment may be needed, and if and when a disease is becoming resistant to medication.

ELECTRONIC HEALTH RECORDS

Electronic Health Records (EHRs) hold the promise for improving many aspects of emergency health preparedness. Health care providers, insurance companies, and the public health system should work together to ensure that the development of EHRs are compatible and include the ability to:

- Incorporate full and updated vaccination records for patients;
- Provide patients and their doctors with easy access to vaccine histories and reminders of needed vaccines. In addition, this system should provide information to non-primary care doctors, so patients can receive information about needed vaccines when they visit specialists, such as obstetrician/gynecologists or cardiologists. An integrated system would also make it easier for doctors to track and reach out to patients at high-risk to remind them to get vaccinated;
- Allow health departments to track vaccination rates, surges in disease outbreaks and let people living in communities know when there is increased risk; and
- Let first responders know where to send patients faster and track availability of hospital beds in real time.

▲ **Public Health Laboratory Surge Capacity:**

Within two weeks from the first recognition of H1N1, CDC was able to develop and validate the new polymerase chain reaction (PCR) assay, manufacture the reagents, obtain FDA Emergency use Authorization for use, and begin distributing the kits to qualified laboratories.

Much of this was possible because of deliberate and coordinated pre-pandemic efforts to expand the use of standardized molecular tests for seasonal influenza surveillance in public health laboratories.

Although most public health laboratories were able to quickly implement the new assay and provide surge level confirmatory testing for the pandemic H1N1 virus, testing demand quickly exceeded federal and state laboratory capacity in some jurisdictions, which slowed states' ability to correctly identify and describe the extent of the disease to the public.⁸³

Laboratory capacity has greatly improved since the anthrax attacks in 2001, but there are still challenges in sustaining existing capacities, managing the surge in testing demand during major emergencies, and keeping the labs up-to-date with ever-changing technologies.⁸⁴

- **Even in difficult economic times, it is important to sustain the public health workforce. Action must be taken to recruit, train, and retain the next generation of public health professionals.** Approximately 15 percent of the

local public health workforce has been cut due to financial cutbacks in government budgets. During the H1N1 outbreak, this meant that many health departments were significantly understaffed.⁸⁷ In addition, the federal government had restrictions on categorically-funded programs that meant that state and local governments often could not reassign employees working in other areas of public health to help with the outbreak response. Many state and local governments also had hiring freezes so many health departments could not hire additional staff to help with the response.

Currently, public health departments around the country are facing major workforce shortages, including lost jobs. For example about 25,000 health workers faced reduced hours and required furloughs in 2009. In addition, local health departments have been forced to cut various programs. Most notably, 13 percent of local health departments have made cuts to immunization programs, nine percent have made cuts to epidemiology and surveillance, and seven percent have made cuts to their emergency preparedness programs.⁸⁸ Health departments around the country are also facing an impending "brain drain" – there are an estimated 50,000 fewer public health workers than there were 20 years ago and another one-quarter of current public health workers around the country are eligible for retirement.⁸⁹ From epidemiologists to first responders who detect and contain diseases, the nation's public health workforce is vital to protecting the nation's health. Efforts must be made to fill the void of expertly trained public health workers in the United States.



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Senior Advocate, Climate Center

Natural Resources Defense Council

REPORT AUTHORS

Jeffrey Levi, PhD.

Executive Director

Trust for America's Health and

Professor of Health Policy

The George Washington University School of Public Health and Health Services

Laura M. Segal, MA

Director of Public Affairs

Trust for America's Health

Rebecca St. Laurent, JD

Health Policy Research Associate

Trust for America's Health

Dara Alpert Lieberman, MPP

Government Relations Manager

Trust for America's Health

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Abby Berns

Program Associate, Community Health

National Association of County and City Health Officials

James S. Blumenstock

Chief Program Officer, Public Health Practice

Association of State and Territorial Health Officials

Anna M. Buchanan, MPH

Senior Director, Immunization and Infectious Disease

Association of State and Territorial Health Officials

Paul Etkind, DrPH, MPH

Senior Analyst, Community Health Team / Immunizations

National Association of County and City Health Officials

Lilly Kan, MPH

Senior Analyst - Community Health

National Association of County and City Health Officials

