



# ISSUE BRIEF

The Massachusetts Health Policy Forum

## The Pandemic Threat: Are We Prepared?

**Thursday, June 8, 2006**

**8:30 am to 9:00 am – Breakfast**

**9:00 am to 11:30 am – Presentation and Discussion Featuring:**

**Philip Johnston**, Chair, Massachusetts Health Policy Forum

**Senator Edward Kennedy**, United States Senator (prerecorded video address)

**Dr. Julie Gerberding**, Director, Centers for Disease Control and Prevention

**Dr. Howard Koh**, Assoc. Dean for Public Health Practice, Harvard School of Public Health

**Commissioner Paul Cote**, Massachusetts Department of Public Health

**Representative Peter Koutoujian**, House Chair, Joint Committee on Public Health

**Harold Cox**, Chief Public Health Officer, Cambridge Department of Public Health

**Radisson Hotel Boston  
Carver Ballroom  
200 Stuart Street  
Boston, MA**

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## **The Pandemic Threat: Are We Prepared?**

In 1918 during WWI, US troops were infected with a new influenza virus that quickly spread to civilians. Movement of troops around the world further aided spread of this disease, named the Spanish Influenza, that uncharacteristically attacked the young and healthy.<sup>1</sup> By August, influenza had reached Boston ports, and some 2,000 sailors, officers and other men became ill in a matter of days. By October the Public Health Service reported more than 75,000 cases in Massachusetts and almost 800 deaths in Boston alone.<sup>2</sup> Within a few months the Spanish flu had enveloped the world in the worst flu pandemic on record, and by the time the disease outbreak had ceased, 45,000 people had died in the Commonwealth.

An influenza pandemic is a global disease outbreak that occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. The disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time.<sup>3</sup> The most recent flu pandemic, named the “Hong Kong Flu,” occurred from 1968 – 1969 and was responsible for approximately 34,000 deaths in the United States. From 1957 – 1958, the “Asian Flu” took about 70,000 lives in the U.S. and before that, from 1918 – 1919 the “Spanish Flu” was blamed for 50 million deaths worldwide, 500,000 in the U.S. alone.

These previous flu pandemics were caused by avian influenza viruses that had undergone genetic changes which enabled them to infect humans and to spread efficiently. The flu pandemic of 1918 was most likely caused by an avian flu virus that mutated in such a way that human-to-human transmission became easily possible. The current H5N1 avian influenza virus could take a similar path. However, even if this virus does not mutate and cause a pandemic, it is likely that at some point another strain of influenza virus will. For this reason, planning and response are critical, and valuable lessons can be learned from pandemics of the past.

This paper will address the current pandemic threat from avian and other influenza viruses, the treatments available, federal, state and local response and planning, and the policy implications should a pandemic occur. The paper concludes with some discussion about where we are and where we need to go, and some recommendations for policymakers and legislators grappling with the issue of pandemic planning.

## **The Current Avian Flu Threat**

In 1997, during an outbreak (enzootic) of “highly pathogenic avian influenza” among poultry in Hong Kong, 18 people became ill and six of them died. It was determined that the cause of the human illness and deaths was the same avian influenza virus infecting poultry. All of Hong Kong’s 1.5 million poultry were culled and health officials, alarmed at this new development, believed that an influenza pandemic had been prevented.<sup>4</sup>

However, since that time there have been a number of new outbreaks of various strains of avian influenza among poultry.<sup>5</sup> Avian influenza viruses commonly infect wild birds, often causing no apparent illness. However, the virus can be transmitted from wild to domestic birds such as

chickens and turkeys. If infection of domestic fowl is confirmed, these birds are often culled in order to prevent spread of the virus. The H5N1 virus so far has spread primarily from infected domestic birds to humans, generally causing mild to severe respiratory symptoms. In over 50% of reported cases death has resulted.

*Table 1: Influenza types and subtypes* describes the three categories of influenza and the further classification of the Influenza Type A viruses. Avian influenza viruses are classified as type A influenza, the only type of influenza viruses known to cause pandemics. These viruses are subtyped according to the hemagglutinin and neuraminidase proteins that make up the virus. The “H” refers to the hemagglutinin protein and the “N” refers to the neuraminidase protein.

**Table 1: Influenza types and subtypes**

Influenza Types		
Influenza A	Influenza B	Influenza C
<ul style="list-style-type: none"> <li>• Wild birds are natural hosts and reservoir</li> <li>• Affects people, birds, pigs, horses, seals, whales, possibly tigers and cats</li> <li>• Classified by <b>subtype</b> according to surface proteins on the virus:               <ul style="list-style-type: none"> <li>○ Hemagglutinin (HA) proteins:                   <ul style="list-style-type: none"> <li>▪ 16 subtypes</li> </ul> </li> <li>○ Neuraminidase (NA) proteins:                   <ul style="list-style-type: none"> <li>▪ 9 subtypes</li> </ul> </li> </ul> </li> <li>• H1N1 and H3N2 currently found in humans</li> <li>• H5N1 avian flu currently is of most concern for its ability to mutate and potential to cause a pandemic</li> </ul>	<ul style="list-style-type: none"> <li>• Affects humans only</li> <li>• May cause epidemics but not pandemics</li> <li>• Not classified by subtype</li> </ul>	<ul style="list-style-type: none"> <li>• Mild illness in humans</li> <li>• Does not cause epidemics or pandemics</li> <li>• Not classified by subtype</li> </ul>

Adapted from Centers for Disease Control and Prevention, “Influenza viruses: Types, subtypes and strains (available at [www.cdc.org](http://www.cdc.org))

There are several reasons why public health officials are concerned about another pandemic. The H5N1 virus outbreaks that began in late 2003 were caused by “highly pathogenic” or disease-causing avian influenza viruses that were lethal in domestic poultry and some migratory fowl. This time, the avian flu H5N1 has spread rapidly, widely, and with huge consequences for the agriculture of the affected countries. The potential for this virus to mutate and become transmissible from person-to-person, thereby causing a pandemic, is significant. The influenza A H5N1 is a new subtype not yet spread through the human population, so there is no natural immunity to this virus. This means that a pandemic, if it occurs, will have no natural resistance among humans and the consequences could be devastating.<sup>6</sup>

The avian flu H5N1 virus so far has killed an estimated 200 million birds. The World Health Organization (WHO) has confirmed 224 human cases in 10 countries as of May 29, 2006 and more than half of these cases have been fatal; a total of 127 people have died. The WHO has confirmed human cases in the following countries: Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Thailand, Turkey and Vietnam. In calendar year 2006 alone, there have been 80 reported cases and 58 deaths compared to a total last year of 95 cases and 41 deaths.<sup>7</sup>

The current level of pandemic threat, according to WHO, is Phase 3. *Table 2: WHO phases of pandemic alert*, describes the conditions under which a pandemic is declared.

**Table 2: WHO phases of pandemic alert**

<b>Interpandemic Phase:</b>	Low risk of human cases	Phase 1
New virus found in animal but no human cases	Higher risk of human cases	Phase 2
<b>Pandemic Alert:</b>	No or very little human-to-human transmission	<b>Phase 3 (Current Level)</b>
New virus causes human illness	Evidence of increased human-to-human transmission	Phase 4
	Evidence of significant human-to-human transmission	Phase 5
<b>Pandemic</b>	Efficient and sustained human-to-human transmission	Phase 6

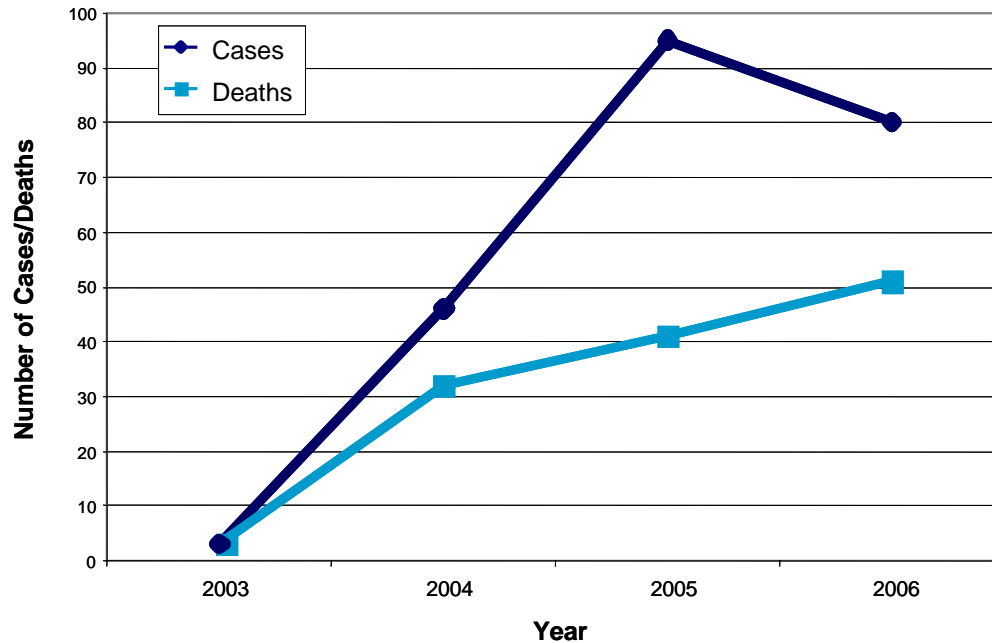
Adapted from World Health Organization, Western Pacific Regional Office: Communicable Disease Surveillance and Response (available at [www.wpro.who.int](http://www.wpro.who.int))

On May 31, 2006, WHO reported a number of cases in North Sumatra, Indonesia, among family members who, on April 29<sup>th</sup>, shared a small room with a woman who was “severely ill,” probably with H5N1. The woman died before samples were collected and so it was not possible to confirm the cause of her illness and death. Subsequently, two of the females and five males developed symptoms, confirmed by WHO as H5N1. Since no one else in the family has become ill and there are no suspected cases in the village where the family resides, WHO feels that Phase 3 level of pandemic alert is still appropriate.<sup>8</sup>

WHO reports that from January 1 – May 17, 2006, the H5N1 virus has been isolated from poultry in Afghanistan, Albania, Azerbaijan, Bosnia and Herzegovina, Burkina Faso, Cambodia, Cameroon, China, Cote d’Ivoire, Djibouti, Egypt, France, Gaza Strip, Georgia, Germany, India, Indonesia, Iraq, Israel, Jordan, Lao People’s Democratic Republic, Malaysia, Myanmar, Niger, Nigeria, Pakistan, Romania, Serbia and Montenegro, Sudan, Sweden, and Turkey. The virus has been isolated from wild birds during the same time span from Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, China, Denmark, Georgia, Germany, Greece, Hungary, Iran, Italy, Scotland, Serbia and Montenegro, Romania, Slovakia, Slovenia, Sweden, Switzerland, Turkey, and Ukraine.<sup>9</sup>

Figure 1: Number of WHO confirmed human avian flu cases and deaths worldwide provides a snapshot, by year, of the total number of cases and deaths that have occurred to date, around the world.

**Figure 1: Number of WHO confirmed human avian flu cases and deaths worldwide; 2003 - May 29, 2006**



Experts agree that another influenza pandemic will likely occur, but when, what and how severe it will be remains unknown.<sup>10</sup> The H5N1 avian influenza viruses that have become enzootic have undergone some mutations as they adapt and infect new species of birds. If the virus mutates in a particular way, rapid transmission from human to human is possible. This is the biggest concern among public health officials,<sup>11</sup> and preparedness is not a straightforward proposition. No one knows for sure whether the virus will actually mutate such that it becomes highly transmissible from human to human, or if the next pandemic will be caused by a different subtype of influenza virus.<sup>12</sup>

**Table 3: Definitions**

<b>Definitions</b>	
Antigenic Drift	Continuous, small changes in the genes of a virus that occur over time, maintaining the virus' ability to cause illness
Antigenic Shift	Sudden, significant changes in a virus which result in a new virus that may not have previously infected humans
Endemic	Constantly present in the environment
Enzootic	Affecting animals of a particular area or limited district
Epidemic	Disease incidence and prevalence above what would normally be expected for that disease
Pandemic	A worldwide epidemic

### **Treatment of Influenza Viruses**

Because influenza viruses mutate rapidly, a vaccine that might have been effective at one time, ceases to be effective later against a new variant virus. Developing a vaccine takes many months, and antiviral medications, such as oseltamivir (Tamiflu™), may not be effective if used late during the course of infection. In fact, overuse or indiscriminate use of antivirals may lead to drug resistance and reduce their effectiveness.<sup>13</sup>

Nevertheless, vaccines and antivirals are the best pharmaceutical weapons available in the public health arsenal for controlling a pandemic of avian flu. Bacterial and viral pneumonia are two complications of influenza infection that may result in death. While antibiotics can be used for bacterial pneumonia, only antivirals can be used for viral pneumonia, and their effectiveness is not known. Furthermore, supplies of vaccines and antivirals -- at least in the mass quantities needed to avoid or slow down a pandemic -- are far from adequate.<sup>14</sup>

Another concern is that vaccine manufacturing is “antiquated” according to Dr. Julie Gerberding of the CDC. Pharmaceutical companies still use chicken eggs to grow viruses for manufacturing vaccinations.<sup>15</sup> The dilemma, of course, is that if poultry need to be culled in order to stop the avian flu from spreading, then from where will vaccine manufacturers get the eggs necessary to produce vaccine?

Even if vaccines and antivirals help and can be produced in the quantities needed, there are other concerns. The problems facing the world today are unlike those that were evident during any of the flu pandemics of the twentieth century. For instance, the world is a much more global community. People travel easily and quickly from one place to another, and animals, both wild and domestic, are traded freely around the world. The prevention of a pandemic will require tremendous cooperation among countries, and within countries between agencies. No single organization or group will be able to address the next pandemic – which many experts believe is inevitable – because it will require a worldwide effort.<sup>16</sup> And although the speed with which a disease is spread does not affect how lethal it will be, the speed of transmission does affect the capacity of the public health infrastructure to respond.

## Are We Prepared?

**Federal response:** On June 30, 2005, the General Accountability Office (GAO) reported on the federal government's ability to respond to an influenza pandemic. The results of the report are, at best, discouraging and, at worst, distressing. By December 2005, Congress allocated \$3.3 billion toward pandemic flu preparedness and response,<sup>17</sup> with a total of \$7.1 billion allocated over the next several years.<sup>18</sup> Dr. Gerberding, Director of the CDC, noted in an interview on March 22, 2006, that the United States is not yet 50 percent prepared, and that some other countries are even less prepared. Although preparation has begun, there is still a long way to go before the world is ready for another pandemic. Nevertheless, some valuable lessons have been learned from past mistakes that can be applied to pandemic preparedness today.

For example the flu vaccine shortage of 2004 – 2005 in the United States provided some important guidance for flu pandemic preparedness, even though the lessons learned have yet to be fully implemented. At this point, it seems likely that there will be a vaccine shortage in the event of a pandemic, given that the number of vaccines required is around 600 million and the current capacity is only about one-tenth of that amount. So far, the federal government has purchased approximately 21.7 million regimens of Tamiflu™ and 4.0 million regimens of Relenza™ (zanamivir) to help supplement state and local supplies. The federal government has a goal of obtaining a total of over 70 million treatment courses of antivirals to treat 25% of the U.S. population, but more may be needed.<sup>19</sup> The Department of Health and Human Services (HHS) plans to subsidize states' purchases of up to 31 million regimens of antivirals. The subsidy, consisting of 25% of the negotiated purchase price, will be allocated to states according to population.

There are several reasons for these shortfalls. Vaccine production remains a private market enterprise and the conditions under which the Secretary of HHS could exercise control over the manufacturing and distribution of vaccines are unclear. There are currently several “options” as opposed to plans, described by HHS in a draft for a pandemic response. Delays in getting out a vaccine and/or antiviral medications, or in identifying who should receive the vaccine on a priority basis, could be deadly during a pandemic. There were significant delays during the 2004 – 05 vaccine shortage as state public health officials scrambled to determine the number of priority status patients needing vaccination.

The usual guidelines for priority vaccination, however, may not be appropriate during an influenza pandemic, because risk factors for severe illness will not be known until the pandemic arrives and morbidity and mortality statistics are available. Priorities for vaccinating the elderly and infirm during the usual flu season may have to be altered, and health care facilities might become quickly overwhelmed. The GAO also cautions that “consistent” and “timely” information on who should receive the vaccine, by whom and in what form, are critical during a pandemic.<sup>20</sup>

Vaccine and antivirals are only part of the picture; a national plan for the treatment of individuals already ill or exposed to the pandemic virus is critical. By Executive Order, authority for quarantine and isolation of individuals exposed to or infected with potentially pandemic influenza viruses was given to the Centers for Disease Control and Prevention. Other

communicable diseases for which the CDC has the authority to quarantine or isolate individuals include smallpox, SARS, cholera, diphtheria, TB, plague, yellow fever and the viral hemorrhagic fevers. While the CDC generally recommends “voluntary home quarantine when possible,” the policy is to defer to state and local health authorities, depending upon local needs and state regulations.”<sup>21</sup>

Likewise, the federal government relies on local communities to respond in the event of a pandemic. On May 3, 2006, the federal government released the *National Strategy for Pandemic Influenza: Implementation Plan*, based upon three guiding principles: preparation and communications; surveillance and disease detection; and response and disease containment. While the federal government would work with the international community to first identify a pandemic and then mitigate its spread and impact, the states and local communities also would be expected to respond to the pandemic.

The nature of a pandemic is that it occurs everywhere. For this reason, it would be impossible for the federal government to respond in the same way that it could to a localized disaster. The federal government would distribute vaccines and antivirals from the Strategic National Stockpile to the states, but states would be responsible for distribution to their residents. Accelerating research and development into medications and vaccines also is a priority of the federal government. The federal plan encourages not only the implementation of emergency plans by state and local officials, health and public health organizations, law enforcement officers, emergency responders, businesses, schools and public and private institutions, but also the coordination of plans among all of these entities. This is admittedly a tall order, but a critical one nonetheless. To help state and local jurisdictions prepare for an influenza pandemic, Congress provided \$350 million in emergency appropriations in December 2005 to upgrade state and local response capacity for pandemic influenza. Funding is being provided in two phases to the 62 grantees of CDC’s Public Health Emergency Preparedness Cooperative Agreement.

Various agencies within the federal government are providing more specific guidance. The U.S. Department of Education provides some guidelines to schools for emergency planning, in which it is recommended that stakeholders at all levels take part, from the governor of the state to grassroots organizers.<sup>22</sup> The U.S. Department of Health and Human Services has issued pandemic planning checklists for childcare and preschool settings, K–12 school districts and colleges and universities. There are also guides available for individuals, families and various healthcare settings. Businesses are also encouraged to create an emergency plan based upon the unique needs of each setting.<sup>23</sup>

**State Response:** The Massachusetts Department of Public Health (MDPH), in collaboration with the Massachusetts State/Local Pandemic Planning Committee and with guidance from the CDC document on *Pandemic Influenza*, put out an Influenza Preparedness Plan on October 5, 2005. The plan, which uses the WHO guidelines, relies on the federal government for “identification and declaration” of a pandemic.<sup>24</sup>

There are 6 areas that the MDPH plan addresses:

1. Procedures for command, control and management
2. Surveillance



3. Vaccine management
4. Delivery of antivirals
5. Emergency response
6. Communications

Each of these is addressed in more detail below.

1. *Procedures outlined for command, control and management:* In the event of a pandemic, these procedures describe coordination of and regular meetings between agencies involved in pandemic planning. These include the MDPH Center for Emergency Preparedness (CEP), the Center for Clinical and Laboratory Services (CCLS), the Bureau of Communicable Disease Control (BCDC), the Center for Environmental Health (CEH), the MDPH Executive Committee for Pandemic Planning and the Governor's Executive Committee for Pandemic Planning which includes leadership of the Massachusetts Emergency Management Agency (MEMA), the Executive Office of Public Safety and the Executive Office of Health and Human Services. All state agencies are responsible for the preparation of Continuity of Government Operations plans, and statewide and local health and human service providers are also preparing Continuity of Operations plans.

The Massachusetts Emergency Management Agency (MEMA), according to the Comprehensive Emergency Management Plan (CEMP) has the responsibility for coordination and response to state-wide emergencies, including pandemics. This response includes private as well as public entities and therefore requires that these entities work closely within the framework of the CEMP. Aside from promoting awareness, each of the agency leaders has very specific responsibilities and priorities for each that are clearly delineated during each of the three levels of pandemic threat: the interpandemic period; the pandemic alert period; and the pandemic period (see Table 2: WHO phases of pandemic alert).

Governor Romney and Lieutenant Governor Healey are leading the development of the Massachusetts Influenza Pandemic Preparedness Plan in close cooperation with the Secretary of Health and Human Services, the Secretary of Public Safety, the Commissioner of Public Health, MEMA, and the rest of the Cabinet. A statewide flu pandemic planning summit was held in February, 2006, and five regional conferences have drawn over 2000 municipal officials, school superintendents, business and faith organization leaders, college and university educators and administrators, hospital CEOs, and local and regional emergency preparedness professionals including police, fire, health, and emergency medicine. Regional and local drills and exercises of statewide, regional, and local continuity of operations plans will begin this summer.

2. *Surveillance:* Surveillance likewise varies depending upon the level of pandemic threat. During the inter-pandemic period, a surveillance team within the MDPH meets weekly to review the surveillance program and to revise the program as needed, based upon the influenza threat. Specific hospital laboratories around the state have the capacity to isolate the influenza virus, the results of which are then sent to the State Laboratory Institute (SLI). The MDPH cautions that testing should not be performed in office settings, since biosafety levels are inadequate for such high-risk samples. Rather, samples need to be directed to the

SLI and patients who exhibit highly suspicious symptoms should be isolated in the same manner as a suspected SARS patient.<sup>25</sup>

Since 2003, the state has required that providers report immediately by telephone, any of the following occurrences: suspected avian influenza cases; any influenza deaths in children under 18 years of age or in pregnant women; “unusually severe” flu; any cases of influenza accompanied by altered brain function (encephalopathy); any “clusters” of suspected influenza; and “clusters” of influenza that occur in high-risk or long-term care facilities. These suspected or confirmed cases and/or clusters of influenza are investigated by the MDPH and recommendations are made “for control and prevention of influenza in all settings.” Reports must be made to the state health department as well as the local health department, since it is the local health department which would be required to implement appropriate infection control measures.

The MDPH suggests there is a need for year-round surveillance of H5N1 influenza. Citing the CDC guidelines, MDPH recommends that anyone with a severe respiratory illness who has traveled to a high-risk area in the last 10 days, should be tested for avian flu. Health care providers should also consider testing patients with an elevated temperature and cold symptoms, and who have been in contact with poultry in the preceding 10 days. In the event that a pandemic occurs, MDPH will work with the CDC and other agencies in an effort to describe and monitor the progression of the pandemic. Continued surveillance will be critical so that morbidity and mortality, hospitalizations, syndromes associated with virus, the effectiveness of treatment and control measures, health care capacity and the effects of the pandemic, can be addressed.

3. *Vaccine:* Once a pandemic has been declared, the MDPH assumes that there will be a lag of at least 6 months before a vaccine is available, at which time an estimated 70,000 doses will be distributed through the SLI. For this reason, vaccine will be targeted to high-risk individuals in the initial stages, until more vaccine is available. One of the challenges in identifying those at highest risk during an influenza pandemic is that, unlike the typical seasonal influenza, young and healthy adults may also become very ill. Who receives vaccine first when vaccine is in short supply will therefore be determined as the pandemic unfolds.
4. *Antivirals:* The MDPH strongly advises against personal stockpiling of antiviral medications such as Tamiflu™. Stockpiling, they warn, would make shortages of the medication more severe and less available to those who need it most. There are many reasons why this medication and other antivirals should be taken only under the guidance of a health care professional. The most dangerous, besides the normal side-effects that occur with any medication, is the concern about drug resistance. That is, the flu virus mutates easily and with overuse or inappropriate use of antiviral medications, the virus can become resistant to the effects of the medication. Since it could take up to six months to create an effective flu vaccine in the event of a pandemic, it is essential that antiviral medications be used judiciously to avoid resistance and to ensure that the medication maintains its efficacy.<sup>26</sup> As with the vaccine, there are challenges in determining who should get antiviral medication and under what conditions. These issues have yet to be resolved. If there are not enough doses to

go around, then prioritizing will be critical. If, on the other hand, these medications are ineffective for treating the avian flu, these concerns become irrelevant.

5. *Response:* It is assumed that, during a pandemic, the public health and health care infrastructures will be seriously challenged by the effects of the influenza virus on the population. Health care workers and first responders will be affected, particularly if the virus continues to affect healthy individuals as it did in the 1918 flu pandemic.<sup>27</sup>

The Massachusetts emergency preparedness plan details the potential consequences of a pandemic to Massachusetts hospitals, including possible number of people affected, the number of hospital beds that might be required, the ability of hospitals to provide isolation and intensive care beds, how hospitals will be staffed, and the availability of supplies and equipment.

The plan further describes the impact on behavioral health professionals, transportation capacity, the needs of special populations and those who are homebound. There are also contingency plans that address the maintenance of “essential community services” such as firefighting and other emergency response, although some of these plans are still in the development stage.

6. *Communications:* This is one of the most critical aspects of pandemic planning and response. The MDPH plan is intended to “ensure an efficient flow of accurate and consistent information during a pandemic.” Information must be communicated to a number of audiences about a wide variety of issues. The general public will require accurate and timely instructions, even though there will be those who are hard to reach and the potential for misinformation or conflicting messages remains strong. There will be a great need to explain what is being done and why, and a tremendous need among health care providers to receive accurate information.

During the interpandemic period, MDPH maintains an influenza website, linked to the CDC site, with updated information about the current situation. Hotlines, satellite broadcast facilities, educational materials (including non-English speaking materials), information for special needs populations, media collaborations, conference calls and information distribution are resources available through MDPH and collaborating entities.

During the pandemic alert and pandemic period, the MDPH Executive Planning Committee, the Commissioner’s Office, the Division of Epidemiology and Immunization, MEMA and a number of other organizations and agencies will have responsibility for ensuring that communication systems are operational, that communication is being conveyed appropriately, regularly and accurately.<sup>24</sup>

***Local Response:*** It is expected that every community within the Commonwealth will have a plan in place to deal with a disaster, including disease outbreaks, bioterrorist attacks or a pandemic. Every community is expected to have Emergency Dispensing Sites (EDS) that can be set up within 24 hours of an emergency being declared, and that can provide vaccinations and

medications to 80 percent of the population within 2 days. The remaining 20 percent of the population, presumably homebound and disabled, should be reached within the next 24 hours.

The MDPH provides guidance to local communities, suggesting that the designation of sites, communications, security and staffing are issues that must be addressed in the planning stages of all EDS. Localities may also opt to create several EDS or a central EDS with a number of satellite units, depending upon the size of the community. Since stockpiles of vaccine and medication will come to the states through the federal government, it is imperative that local districts inform the MDPH, in writing, of the location of each and every EDS in order to get the stockpiles distributed as quickly as possible.

The following guidelines are offered to communities through the *Emergency Dispensing Site Management and Operations* document from MDPH, for establishing EDS:

1. create planning teams and command structures;
2. assess the needs and resources of the community;
3. establish the EDS, including number and location;
4. make plans for the operation of the EDS, including communications, staffing, training and other considerations; and
5. complete the memorandum of understanding (MOU) with communities, facilities, and agencies involved in the operation of the EDS.

Once an emergency has been declared, the EDS would be notified and begin the activation process by notifying all stakeholders and setting up the EDS for dispensing. Closure of some facilities and opening of others may be required. Demographics, security and communications must be considered throughout the process. Staffing of the EDS and protection of that workforce also must be kept in mind before the dispensing process begins. The MDPH document provides detailed instructions for communities on how to create and implement emergency operations in the event of a disaster.<sup>28</sup>

The Massachusetts Health Officers Association (MHOA) also created a template for local boards of health and public health personnel to assist them in planning for a pandemic or other public health emergency. The template offers very specific guidelines to local municipalities, including reasons to activate the emergency plan, who can activate the plan, how the plan should be activated and recommendations for what the plan itself should contain. The template provides space for names of those who will be responsible for the plan and for updates to the plan as needed, as well as a list of acronyms and definitions used for emergency planning purposes.

It is recommended that local officials familiarize themselves with the state and federal emergency plans as well as the template created by the MHOA. Planning “partners” should be identified at the beginning of the process and local capabilities and resources assessed. The Incident Command System (ICS) used by fire officials and MEMA is the recommended way to organize and develop an emergency response management organization, according to the template. The actual emergency plan should then be drafted, reviewed, modified and then distributed. Training must then take place and exercises and drills that test the plan and provide information on what works and what doesn’t, so that the plan can be reworked if needed. The

template contains detailed explanations and checklists to assist local communities with specific planning needs.

The planning document from MHOA contains four sections. The first is an overview of local response including the purpose and scope of the plan, resources needed and/or lacking and phases of and command structure for a response. Within this first section is a COOP that details how essential functions within the community will be maintained in the event of significant absenteeism related to illness, which could occur during a flu pandemic. The second section contains information about risk communications, notifications, shelter and mass fatality support, logistics as well as roles and job actions.

The third section deals specifically with infectious disease response. This section includes important information about disease surveillance and control, response actions deemed necessary in the event of an outbreak, and specific direction for local health departments if there is a need to invoke quarantine or isolation powers as allowed by Massachusetts law. The document also outlines how to select appropriate emergency dispensing sites (EDS), through which mass prophylaxis or targeted prophylaxis should be administered.

Section four provides a checklist for the specific steps that should be taken by local municipalities in the event of a chemical or radiological incident. This section includes facts about exposure, how to protect first responders and those exposed, who should be notified, risk communications suggestions, shelter recommendations and support should mass fatalities occur.<sup>29</sup>

There are, however, some issues that make local planning and preparedness difficult. It will take approximately six months before an appropriate flu vaccine will be available. Once available, there will not be enough vaccine to dispense to every citizen. Even if there were enough vaccine, it is unlikely there will be an adequate number of volunteers to administer the vaccine and care for patients, since the healthcare workforce will also be affected by the pandemic. Continued funding is critical to both state and local health departments in order that they be able to mount an effective response to any public health emergency.

The Massachusetts Public Health Association (MPHA) agrees that planning and preparing for a pandemic or other public health emergency requires that local public health departments, as well as the state laboratory, receive adequate funding. In addition to funding, however, there is a need for strong leadership, coordination between state and local public health departments, accurate communication of risk, planning for special needs populations and coordination between all sectors of the community. It is not clear whether or not Massachusetts has met each of these challenges.

***Individual Preparedness:*** It is also critical that individuals prepare for an eventual pandemic. The CDC website provides a checklist for this purpose. The CDC recommends stockpiling enough food, medications and supplies for a two-week period, and some experts suggest that a four-week supply is advisable. A list of supplies to consider can be found in *Table 4*.

**Table 4: Supplies for Individuals and Families**

Non Perishables		Other Supplies	
Ready-to-eat canned foods	Canned juices	Medicines and medical supplies	Fluids with electrolytes
Protein or fruit bars	Bottled water	Soap and water, or alcohol-based (60-95%) hand wash; Cleansing agent/soap	Manual can opener
Dry cereal or granola	Baby food, formula	Medicines for fever, such as acetaminophen or ibuprofen	Flashlight
Peanut butter or nuts	Pet food	Thermometer	Batteries
Dried fruit	Other non-perishable items	Anti-diarrheal medication	Portable radio
Crackers		Vitamins	Garbage bags

Adapted from Pandemic Flu Planning Checklist for Individuals and Families (available at <http://www.pandemicflu.gov/planguide/checklist.html>)

In addition to stockpiling food, supplies and needed medications, individuals should have their own emergency plans in place: where to meet in the case of any disaster; how to communicate with one another; and volunteer and be involved in the community in order to have an awareness of how the community is planning for a pandemic. In the absence of antivirals and vaccine during a pandemic, individuals might choose to remain at home until the crisis has passed.

In the meantime, the MDPH offers specific guidelines for preventing the spread of flu virus. These are outlined in *Table 4: Avoiding the spread of flu*.

**Table 4: Avoiding the Spread of Flu**

<b>Massachusetts Department of Public Health Recommendations for Preventing the Spread of a Flu Virus</b>
<ol style="list-style-type: none"> <li>1. Perform frequent hand washing with warm soap and water</li> <li>2. Avoid touching eyes, nose and mouth</li> <li>3. Be sure to cover the mouth when sneezing or coughing</li> <li>4. Clean areas that are frequently touched</li> <li>5. Avoid crowds and close contact with those who are ill</li> <li>6. Be especially careful when traveling to high-risk areas</li> <li>7. Get the annual influenza vaccine</li> <li>8. Stay at home if ill</li> <li>9. Get the pneumococcal vaccine if at high-risk for pneumonia.</li> </ol>

## What Now?

The most recent lessons in pandemic planning and preparedness are those learned from the SARS outbreak. The primary mode of transmission of the SARS virus occurred through close contact between people living in the same household or working in the same healthcare setting. Basic public health principles applied in the affected countries went a long way toward preventing a global pandemic. These principles included early identification of cases, social distancing practices and stepped-up infection control measures.<sup>30</sup> In the event of an influenza pandemic, it is likely that the virus will spread rapidly, so that these and other basic public health principles will need to be applied and adhered to around the globe, in every sector of society and at all levels of government.

Not only will international, federal, state and local governments need to be involved, but so too will healthcare and public organizations, emergency institutions, law enforcement agencies and businesses, including universities, schools and public and private institutions, as well as individual citizens around the world. Each will have unique and specific needs as well as very particular assets, but will be called upon to respond. Furthermore, all of these entities must work together in order to mitigate and respond to an influenza pandemic.

When and where the next pandemic will occur is uncertain. That one will occur is likely. Preparing for a pandemic is both complex and time consuming. The best that we can do, in the face of the uncertainty surrounding the pandemic threat, is to be prepared. In simple public health terms, an ounce of prevention could go a long way toward finding and implementing a cure, or at the very least mitigating the disastrous effects of flu pandemics in the past.

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