

CHAPTER 2 — U.S. GOVERNMENT PLANNING FOR A PANDEMIC

The Pandemic Threat

Influenza viruses have threatened the health of animal and human populations for centuries. Their diversity and propensity for mutation have thwarted our efforts to develop both a universal vaccine and highly effective antiviral drugs. As a result, and despite annual vaccination programs and modern medical technology, influenza in the United States results in approximately 36,000 deaths and 226,000 hospitalizations each year.

A pandemic occurs when a wholly new strain of influenza virus emerges that has the ability to infect and be passed between humans. Because humans have little immunity to the new virus, a worldwide epidemic, or pandemic, can ensue. Three human influenza pandemics occurred in the 20th century, each resulting in illness in approximately 30 percent of the world population and death in 0.2 percent to 2 percent of those infected. Using this historical information and current models of disease transmission, it is projected that a modern pandemic could lead to the deaths of 200,000 to 2 million U.S. citizens.²

The animal population serves as a reservoir for new influenza viruses. Scientists believe that avian, or bird, viruses played a role in the last three pandemics. The current concern for a pandemic arises from an unprecedented outbreak of H5N1 influenza in birds. In 1997, the H5N1 influenza virus emerged in poultry in Hong Kong and infected 18 people, 6 of whom died. Since then, the virus has spread across bird populations in Asia, Europe, and Africa resulting in the deaths, through illness and culling, of over 200 million birds. In addition, the virus has shown the ability to infect multiple species, including long-range migratory birds, pigs, cats, and humans. To date, the virus is known to have infected over 200 persons in the Eastern Hemisphere, and resulted in the deaths of more than half of those known to be infected. This mortality rate is due in part to the fact that H5 influenza viruses have not previously circulated in humans, so the population has no background immunity to these viruses. It is impossible to predict whether the H5N1 virus will lead to a pandemic, but history suggests that if it does not, another novel influenza virus will emerge at some point in the future and threaten an unprotected human population.

While a pandemic will lead to a significant toll that is measured in human illness and death, its impact will extend far beyond hospitals, infirmaries, and doctors' offices. Because influenza viruses do not respect geography, age, race, or gender, the impact of a pandemic will be pervasive, removing essential personnel from the workplace for weeks, due to their own illness, illness in a family member, or as a result of public health guidance to limit contact with others. Absenteeism across multiple sectors will threaten the functioning of critical infrastructure providers, the movement of goods and services, and operation of anchor institutions such as schools and universities. This has significant ramifications for the economy, national security, and the basic functioning of society.

The economic repercussions of a pandemic could be significant. The Congressional Budget Office has estimated that a pandemic on the scale of the 1918 outbreak could result in a loss of 5 percent of gross

²A Potential Influenza Pandemic: Possible Macroeconomic Effects and Policy Issues. Congressional Budget Office, December 8, 2005

domestic product, or a loss of national income of about \$600 billion. These effects will occur through two main channels. A pandemic will affect the economy directly through illness and mortality caused by the disease, and the associated lost output. A pandemic will also generate indirect costs, from actions taken to prevent and control the spread of the virus. Some of these actions will be taken by the government. Others will be taken by institutional leaders and employers, while still others will be the result of uncoordinated individual responses to avoid infection. These latter reactions will reflect public perceptions and fears.

Preparedness for a pandemic requires the establishment of infrastructure and capacity, a process that can take years. For this reason, significant steps must be taken now. This Implementation Plan (Plan) for the *National Strategy for Pandemic Influenza (Strategy)* acknowledges this reality, and makes it clear that every segment of society must prepare for a pandemic and will be a part of the response. The Plan further recognizes that the Federal Government must provide clear criteria and decision tools to inform State, local, tribal, and private sector planning and response actions, and that Federal agencies must be prepared to supplement and support State, local, and tribal efforts where necessary and feasible.

The National Strategy for Pandemic Influenza

Pandemics represent a unique threat to the health and well being of human populations and ultimately to the functioning of society. As products of a complex ecosystem, their timing cannot be predicted and their emergence cannot be controlled. Because novel influenza viruses meet little immunological resistance in the population, their impact is widespread and can be severe, threatening the functioning of all elements of society. The recognition of this potential impact has led governments around the globe to accelerate their planning efforts to combat and prepare for a pandemic. It has also led governments and international health organizations around the globe to call for transparency in reporting of cases of pandemic influenza, scientific cooperation to characterize the virus and develop effective vaccines, and coordinated international plans to stop, slow, or limit the spread of a pandemic virus after it emerges.

In response to this threat, the President announced the *National Strategy for Pandemic Influenza* on November 1, 2005. The *Strategy* provides a high-level overview of the approach that the Federal Government will take to prepare for and respond to a pandemic, and articulates expectations of non-Federal entities to prepare themselves and their communities.

The *Strategy* contains three pillars: (1) preparedness and communication, (2) surveillance and detection, and (3) response and containment. Each pillar describes domestic and international efforts, animal and human health efforts, and efforts that will be undertaken at all levels of government and in communities to prepare for and respond to a pandemic. It describes the manner in which the Federal Government will support preparedness efforts domestically and internationally in regions affected by avian influenza outbreaks, including the establishment of vaccine and antiviral production capacity and stockpiles; mechanisms to ensure timely coordinated messages to the public, whether from Federal, State, local, or tribal entities, or international authorities; establishment of early warning systems that allow us to activate our response mechanisms and the production and administration of vaccine before the arrival of a pandemic to our shores; and coordinated responses domestically and internationally to limit the spread of disease and mitigate disease, suffering and death.

The *Strategy* makes it clear that the Federal Government will use all instruments of national power to address the pandemic threat. However, if efforts to contain the outbreak at its source fail, the resources of the Federal Government will not be sufficient to prevent the spread of a pandemic across the Nation and

its resulting impact on communities, workplaces, families, and individuals. An effective response will require the full participation of all levels of government and all segments of society.

Implementation of the *National Strategy*

While the *Strategy* provides an important framework for Federal Government planning for an influenza pandemic, it must be translated to tangible action that fully engages the breadth of the Federal enterprise. This Plan proposes that Federal departments and agencies take specific, coordinated steps to achieve the goals of the *Strategy*. Because preparedness and response activities depend upon entities outside of the Federal Government, it also outlines expectations with respect to non-Federal stakeholders in the United States and abroad. Joint and integrated planning across all levels of government and the private sector is essential to ensure that available national capabilities and authorities produce detailed plans and response actions that are complementary, compatible, and coordinated.

This Plan supports Homeland Security Presidential Directive 8 (HSPD-8) by identifying coordinated preparedness and response actions to combat pandemic influenza. All actions in this Plan emphasize jointness and coordination of effort between and among Federal, State, tribal, and local entities. The purpose of HSPD-8 is to establish “policies to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal, establishing mechanisms for improved delivery of Federal preparedness assistance to State and local governments, and outlining actions to strengthen preparedness capabilities of Federal, State, and local entities.”

Because it is essential for all institutions to develop their own pandemic plans, this Plan provides guidance for non-Federal entities on the development of their institutional plans, including State, local, and tribal entities, businesses, schools and universities, and non-governmental organizations (NGOs). It also provides guidance for individuals and families on ways that they can prepare for a pandemic. Additional resources to support this planning are available at www.pandemicflu.gov. Federal agencies are expected to further supplement this Plan with guidance on pandemic planning for their respective stakeholders.

Finally, this Plan describes the series of actions that the Federal Government will take when an influenza virus with pandemic potential is identified in the human population anywhere in the world, recognizing that while we are devoting significant resources to early warning and containment overseas, a pandemic strain of influenza virus could also originate in the United States.

This Plan is divided into chapters that address the breadth of major considerations raised by a pandemic: protecting human health, protecting animal health, international considerations, transportation and borders, security considerations and institutional considerations. The chapters include the following:

- Narrative descriptions of the scope of the challenges and key considerations, followed by the rationales underlying the Federal Government approach;
- The roles and responsibilities of Federal departments and agencies, State, local, and tribal entities, the private sector, and individuals and families;
- A comprehensive set of over 300 actions for Federal departments and agencies to address the pandemic threat, each accompanied by lead and supporting agencies, outcome measures, and timelines for action; and

- Clearly defined expectations for non-Federal stakeholders.

An appendix at the end of this Plan provides a brief description of relevant legal authorities in each chapter, as well as the manner in which the Federal Government will implement the Plan.

While this Plan proposes that departments and agencies to undertake a series of actions in support of the *Strategy*, it does not describe the operational details of how departments will accomplish these objectives. Departmental pandemic plans will provide those details, and will address additional considerations raised during a pandemic, including (1) protection of employees, (2) maintenance of essential functions and services, and (3) the manner in which departments and agencies will communicate messages about pandemic planning and response to their stakeholders. Specific guidance on the development of department plans is included in Chapter 9 and Appendix A.

The proposals contained within this Plan build upon a historic and comprehensive set of actions taken by the Federal Government in 2005 to address the pandemic threat. The actions include the development of a promising human vaccine against the H5N1 avian influenza virus, the submission of a \$7.1 billion budget request to support pandemic preparedness, the establishment of the International Partnership on Avian and Pandemic Influenza, and the first Cabinet-level exercise to assess the Federal Government response to a naturally occurring threat.

Necessary Enablers of Pandemic Preparedness

View Pandemic Preparedness as a National Security Issue

A complex balance exists between humans and the microbial world. We are forced to take notice when this balance is disrupted, but antimicrobials and medical therapies usually allow us to restore the steady state to which we have become accustomed, limiting the impact of infectious disease to an individual or a community. Because our public health and medical system is well equipped to deal with the routine challenges presented by the microbes around us, the impact of infectious diseases and the policies and procedures that guide our actions remain largely within the purview of these communities.

The pandemic threat is different. In the event of a pandemic, the transmissibility of influenza viruses, the universal susceptibility of the world's population to viruses that have not previously circulated, and the mobility of human populations mean that every corner of the globe and every element of society are likely to be touched. This has ramifications not only for the health and well being of populations, but for the national and economic security of nations, and the functioning of society. Once this fundamental premise is recognized, the scope and scale of the measures necessary to prepare for a pandemic become apparent.

Promote Connectivity

One of our greatest vulnerabilities is the lack of connectivity between communities responsible for pandemic preparedness. This applies to the coordination of efforts between nations, between the health and non-health communities, between the public health and medical communities, and between the animal and human health communities.

Public Health and Medical Communities

In the United States, the public health community has responsibility for community-wide health promotion and disease prevention and mitigation efforts, and the medical community is largely focused

on action at the individual level. Insufficient communication and coordination between these communities represents a vulnerability in our preparedness for an influenza outbreak. During a pandemic, the medical community must have awareness of the ongoing epidemiological analysis and community-wide interventions being recommended by public health leaders, and the public health community must have situational awareness of the evolution of disease that can only come from connectivity to the emergency departments and other acute care settings where patients with influenza are presenting. The inter-pandemic period presents an opportunity to establish and test these relationships.

International Community

Given that viruses do not respect borders, and that one country's actions will have ramifications for the rest of the globe, we should work to align pandemic preparedness and response efforts across nations. The international community should conform to pre-specified standards for disease reporting, scientific cooperation, public health measures to limit disease spread, and the range of related measures that support our objectives of early warning and rapid response. Early adoption of the International Health Regulations by nations represents an important step in this direction, as does the commitment by nations to the principles of the International Partnership on Avian and Pandemic Influenza. The international community must build upon these agreements to establish coordinated national policies, protocols, and procedures to ensure that we have a consistent response across nations upon the emergence of a pandemic virus.

Health and Non-Health Communities

Because the impact of a pandemic will be felt across society, it is essential that all institutions prepare for what would normally be left to the purview of the health and medical communities. This requires a shift in thinking for most governmental and non-governmental entities, particularly businesses, which may not be accustomed to planning around health considerations. While these organizations have a responsibility to plan on behalf of their employees, customers, students, and other stakeholders, it is incumbent upon the health and medical communities to provide guidance on how to accomplish this planning. This can only be accomplished through the establishment of relationships between the health community and agencies across the government and entities across the community.

Animal and Human Health Communities

Animals serve as a limitless reservoir for new human pathogens. While influenza viruses have demonstrated this over centuries, we have also learned this lesson from HIV and the virus responsible for SARS. We must address the barriers between the animal and human health communities that exist at all levels of government, between NGOs, within academia, and in the community. These barriers have impeded international preparedness and response efforts to the ongoing pandemic in birds, have delayed our recognition of threats to human health, and ultimately have contributed to the overall risk of an avian virus adapting itself to the human host. While cooperation is improving between these sectors domestically, we must encourage the same between ministries of agriculture and health in other nations, and require this of the multilateral organizations that represent these communities.

Communicate Risk and Responsibility

Uncertainty during a pandemic will drive many of the outcomes we fear, including panic among the public, unpredictable, and unilateral actions by governments, instability in markets, and potentially

devastating impacts on the economy. The need for timely, accurate, credible, and consistent information that is tailored to specific audiences cannot be overstated. This requires coordinated messaging by spokespersons across government, at the local, State, tribal, and Federal levels, and by our international partners. It also requires the designation and training of a cadre of spokespersons within relevant organizations, the ability to provide guidance in the setting of incomplete information, and the acknowledgement that this guidance may change as more information becomes available. Such a capability should be developed before a pandemic, as should the key messages that we know we will have to communicate upon the emergence of a pandemic virus.

As important as it will be to provide clear guidance during a pandemic, it is equally important to communicate expectations and responsibilities of all relevant stakeholders before a pandemic begins. Disease transmission occurs on an individual basis, and the outbreak of an infectious disease represents the summation of innumerable individual actions. Actions taken at the individual level do matter, as do actions by all organizations, irrespective of their size.

The need for individual and organizational participation in pandemic planning is amplified by the fact that governments and the Federal Government in particular, have limited ability to impact the spread of disease at the community level. Moreover, we can predict that the Federal Government will have limited capacity to augment the health and other infrastructure needs of specific communities when the entire Nation is overwhelmed. This reality, and the concomitant requirement for local self-sufficiency, must be communicated to States, communities, organizations, commercial enterprises, and even individuals before a pandemic begins.

Support Multilateral Organizations

A pandemic is a global threat that has the potential to impact every nation. Because an outbreak in any location in the world threatens all nations, it is critically important that the international community coordinate its preparedness and response activities. Nowhere is this more apparent than in our containment planning efforts. This requires international standards for surveillance, transparency, sample sharing, and swift coordinated action upon the recognition of an outbreak. It also requires the presence of credible and independent arbiters of scientific and epidemiologic information as it becomes available.

The World Health Organization (WHO) represents the linchpin of international preparedness and response activities. It is bolstered by other multilateral and bilateral organizations, but during a pandemic we will rely upon it to be a highly visible and credible coordinator of the international response. Given the critical role that it plays, it is essential that the international community support its efforts with resources and personnel, and expand plans to provide emergency increases in capacity when the emergence of a pandemic virus is suspected or confirmed.

As we take action to support the efforts of the WHO, we must draw attention to the need to expand and enhance coordination of international animal health efforts. Given the near certainty that the next pandemic will emerge from an animal reservoir, it is critically important that the multilateral organizations responsible for animal health, particularly the United Nations (UN) Food and Agriculture Organization (FAO), be prepared to assist nations that are in the midst of or threatened by an outbreak of avian influenza.

Merge Preparedness for Natural and Deliberate Threats

While the initial events leading to a deliberate or natural outbreak of infectious disease are dramatically different, the actions necessary to prepare, provide early warning, and respond are nearly identical. We

should make this principle explicit in our planning for outbreaks and ensure, to the extent possible, that the mechanisms that we put in place are mutually supportive. This has clear implications for the manner in which the Federal Government directs its biodefense resources, but it similarly places a responsibility upon the public health community to ensure that the infrastructure established at the State, local, and tribal levels to support traditional public health priorities is configured to meet our biodefense requirements.

Advancing Pandemic Preparedness

The U.S. Government has already taken a historic series of actions, domestically and internationally, to address the pandemic threat:

- **The *National Strategy for Pandemic Influenza*** was announced on November 1, 2005, and provides strategic direction for all Federal departments and agencies, and clearly articulates expectations of non-Federal stakeholders, in pandemic preparedness, surveillance, and response. It also outlines a strategy for establishing domestic vaccine and antiviral medication production and stockpile capacity to protect the population and limit the spread of a pandemic virus in the United States and to provide treatment to those who become ill. The *Strategy* is supported by this Plan and department and agency-specific pandemic plans.
- **An Emergency Budget Request of \$7.1 billion to support activities over several years** was submitted to Congress to support the objectives of the *Strategy*. An initial appropriation in FY06 of \$3.8 billion has been made to support the budget requirements of the first year of the initiative. While much of the funding is directed toward domestic preparedness and the establishment of countermeasure stockpile and production capacity, over \$400 million is directed to bilateral and multilateral international efforts and builds upon the \$25 million appropriation of funds in the emergency Tsunami Appropriation Act Supplemental of 2005. Key programs that will be supported by the funds appropriated to date:
 - Expansion of domestic vaccine production capacity to provide greater quantities of this critical medical countermeasure than now is possible. The primary objective, depending upon availability of future appropriations and the responsiveness of the vaccine industry, is for domestic manufacturers to be able to produce enough vaccine for the entire U.S. population within 6 months of the recognition of a human influenza virus with pandemic potential. A supporting objective is to develop and maintain a standing stockpile of vaccine to protect 20 million U.S. citizens against each currently circulating influenza virus (currently avian H5N1 virus) that could become a virus with human pandemic potential.
 - Expansion of stockpiles of antiviral medications to treat more U.S. citizens than current stockpiles will allow. The primary objective, depending upon the availability of future appropriations and global production capacity, is to acquire sufficient drugs to treat 75 million U.S. citizens, or 25 percent of the U.S. population, during an influenza pandemic plus 6 million courses to be directed to containment of initial outbreaks in the United States.
 - Expansion of surveillance capabilities domestically and internationally, in humans and animals, to provide early warning of a pandemic and its arrival to our shores, and to target public health interventions during a pandemic.
 - Investments in the development of risk communication strategies, to ensure that timely, credible, and consistent messages are being provided to the public by all authorities before and during a pandemic.

- Investments in multilateral organizations and on a bilateral basis to expand scientific, public health, surveillance, and response capacity in countries currently affected by the H5N1 avian outbreak.

Enhancing Domestic Preparedness

- **Over \$6 billion has been invested in State and local public health and medical preparedness since 2002 for activities that directly support pandemic preparedness.** The development of pandemic plans by States has been a requirement of the Centers for Disease Control and Prevention Cooperative Agreements and the Health Resources and Services Administration Hospital Bioterrorism Preparedness Grants since 2004.
- **Real-time surveillance of disease in communities is being established by the BioSense Real-Time Clinical Connections Program,** in order to provide real-time “situational awareness” to public health officials in communities across the country during a pandemic and to facilitate the targeting of public health interventions. Ten cities were chosen to initiate the program, with a goal of including all 31 BioWatch communities by the end of 2006.
- **The Department of Homeland Security (DHS) has established a National Biosurveillance Integration System** to collect, integrate, and analyze domestic and international all-source information. The system will integrate human disease, agriculture, food, and environmental surveillance systems.
- **A Cabinet-level tabletop exercise of the Federal Government response to a pandemic** was held in December 2005 to identify and address gaps in capabilities and coordination. The exercise was the first of its kind to test the Federal response to any event, natural or deliberate, and highlighted key policy issues that are currently being addressed and resolved. The exercise will lay the foundation for ongoing assessments of Federal preparedness for a pandemic.
- **The Department of Health and Human Services’ (HHS) pandemic influenza plan** and guidance for State, local, and tribal preparedness was released on November 2, 2005. It provides comprehensive guidance for States, communities, tribal entities, hospitals, health care providers, and individuals on actions that they should take to prepare for a pandemic.
- **An HHS National meeting of States** was held in Washington, D.C., in December 2005 to provide guidance on the development of State and local pandemic preparedness and response plans. A series of more than 60 local summits on pandemic preparedness, encompassing all 50 States, will be completed in the first half of 2006.
- **The proposed Federal quarantine regulations,** which have been published for public comment, contain enhanced reporting mechanisms and procedures for conducting epidemiologic investigations, and influenza viruses with pandemic potential have been added to the list of quarantinable diseases.
- **A Memorandum of Understanding has been signed by HHS and DHS** to ensure coordination of border screening activities and information sharing for contact tracing during an outbreak of a communicable disease and references operating guidelines specific to H5N1.

Developing, Producing, and Stockpiling Vaccines and Antiviral Medications

- **Human vaccines against the H5N1 avian influenza virus have been developed** in conjunction with manufacturers and are undergoing testing by HHS. Vaccine will be stockpiled to provide an

immediately available supply of “pre-pandemic” H5N1 vaccine while a new vaccine tailored to the specific virus that emerges is developed after a pandemic begins.

- **Investments have been made since 2004 to advance cell culture technology for the production of influenza vaccine.**
- **Over 4 million treatment courses of antiviral medications are held in the Strategic National Stockpile (SNS),** with plans to expand to 50 million courses in the SNS, and another 31 million courses in State-based stockpiles, the procurement of which will be subsidized by the Federal Government.
- **Added procedures for comprehensive liability protection for pandemic and epidemic countermeasure manufacturers, distributors, program planners, persons who prescribe, administer, and dispense countermeasures, officials, agents, and employees of each of these entities, and a compensation program** have been put in place through legislation that was introduced and passed in 2005, thereby removing a major impediment to the establishment of a domestic vaccine production base, while ensuring that those who are harmed by a pandemic vaccine receive compensation.

Enhancing International Cooperation, Capacity, and Preparedness

- **The International Partnership on Avian and Pandemic Influenza** was launched by the United States on September 14, 2005, to ensure transparency, scientific cooperation, rapid reporting of cases, donor coordination, and a series of other actions to support global preparedness and response. The Partnership will increase cooperation among participating countries and international organizations including WHO, FAO, and the World Organization for Animal Health to develop global capacity to address an incipient pandemic. The Partnership agreed at its first meeting in Washington, D.C., in October 2005 to elevate pandemic influenza on national agendas, coordinate efforts among donor and affected nations, mobilize and leverage resources globally, and increase transparency in disease reporting and surveillance and building capacity.
- **The United States is working on a bilateral basis to support local, national, and regional efforts to build capacity, increase reporting, ensure scientific cooperation, and enhance overall preparedness.** The United States, Indonesia, and Singapore also agreed to create a model avian influenza-free zone in Indonesia to develop and demonstrate best practices to prevent infection and spread of a pandemic virus in both animals and humans. The Regional Emerging Disease Intervention Center in Singapore, jointly staffed by Singapore and the United States, is conducting training on avian influenza in Southeast Asia and developing the model for the Joint Avian Influenza Demonstration Project. The United States also is working with China to strengthen vaccine development, disease surveillance and rapid response, and pandemic planning through the U.S.-China Joint Initiative on Avian Influenza. Given the challenge of containing an outbreak of a pandemic virus on the North American continent, the United States has also begun discussions with Canada and Mexico to develop an agreed doctrine to respond to and contain a pandemic.
- **Working through existing multilateral frameworks to advance the goals of the Partnership.**
 - WHO: The United States is assisting WHO in the development of a response and containment protocol for consideration and adoption by the World Health Assembly. In addition, the United States is supporting other WHO efforts at improving the detection and response capabilities of other countries and ensuring that all actions are consistent with the International Health Regulations.

- APEC: At the November 2005 Asia Pacific Economic Cooperation (APEC) Summit, the United States supported APEC's Initiative to Prepare For and Mitigate an Influenza Pandemic to strengthen response and preparedness in the region, including through an inventory of regional disaster management capabilities, exercise of regional communications, and an Emerging Infectious Diseases Symposium in Beijing.
- GHSAG: Health Ministers from Canada, France, Germany, Italy, Japan, Mexico, United Kingdom, and the United States cooperate in the Global Health Security Action Group (GHSAG) to refine national pandemic influenza plans, support development of WHO protocols for early containment of influenza, and coordinate on capacity building in developing countries.
- G-8: The United States is encouraging the G-8 to support the development of an avian influenza plan and information packages for affected countries to use in the event of an outbreak, to agree on deployment of WHO stockpiles of antiviral medications and to adhere early to WHO's revised International Health Regulations.
- The United States is engaged with the private sector, including business groups like the APEC Business Advisory Council, the U.S.-Association of Southeast Asian Nations (ASEAN) Council, the American Chamber of Commerce, and the non-governmental community, on the role the private sector can play in preparing for and responding to a pandemic outbreak.

Planning Assumptions

Planning Assumptions for the Implementation Plan

Pandemics are unpredictable. While history offers useful benchmarks, there is no way to know the characteristics of a pandemic virus before it emerges. Nevertheless, we must make assumptions to facilitate planning efforts. Federal planning efforts assume the following:

1. Susceptibility to the pandemic influenza virus will be universal.
2. Efficient and sustained person-to-person transmission signals an imminent pandemic.
3. The clinical disease attack rate will be 30 percent in the overall population during the pandemic. Illness rates will be highest among school-aged children (about 40 percent) and decline with age. Among working adults, an average of 20 percent will become ill during a community outbreak.
4. Some persons will become infected but not develop clinically significant symptoms. Asymptomatic or minimally symptomatic individuals can transmit infection and develop immunity to subsequent infection.
5. While the number of patients seeking medical care cannot be predicted with certainty, in previous pandemics about half of those who became ill sought care. With the availability of effective antiviral medications for treatment, this proportion may be higher in the next pandemic.
6. Rates of serious illness, hospitalization, and deaths will depend on the virulence of the pandemic virus and differ by an order of magnitude between more and less severe scenarios. Risk groups for severe and fatal infection cannot be predicted with certainty but are likely to include infants, the elderly, pregnant women, and persons with chronic or immunosuppressive medical conditions.
7. Rates of absenteeism will depend on the severity of the pandemic. In a severe pandemic, absenteeism attributable to illness, the need to care for ill family members, and fear of infection may reach 40 percent during the peak weeks of a community outbreak, with lower rates of absenteeism during the weeks before and after the peak. Certain public health measures (closing schools, quarantining household contacts of infected individuals, “snow days”) are likely to increase rates of absenteeism.
8. The typical incubation period (interval between infection and onset of symptoms) for influenza is approximately 2 days.
9. Persons who become ill may shed virus and can transmit infection for one-half to one day before the onset of illness. Viral shedding and the risk of transmission will be greatest during the first 2 days of illness. Children will play a major role in transmission of infection as their illness rates are likely to be higher, they shed more virus over a longer period of time, and they control their secretions less well.
10. On average, infected persons will transmit infection to approximately two other people.
11. Epidemics will last 6 to 8 weeks in affected communities.
12. Multiple waves (periods during which community outbreaks occur across the country) of illness are likely to occur with each wave lasting 2 to 3 months. Historically, the largest waves have occurred in the fall and winter, but the seasonality of a pandemic cannot be predicted with certainty.